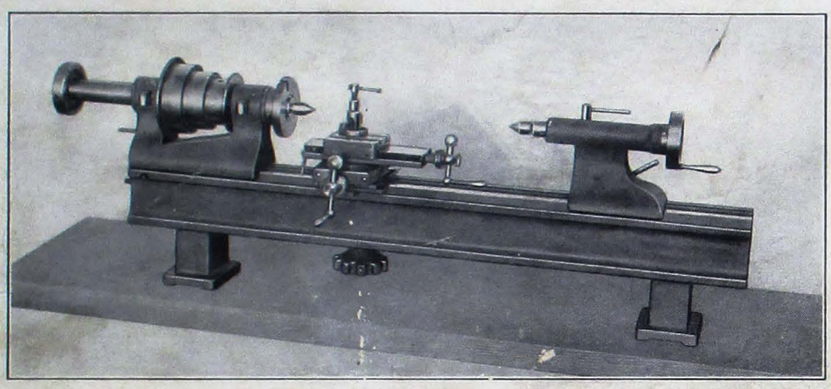
The Rivett

Junior Bench Lathe No. 507



Bulletin No. 507-A

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

The Reason For Being

TO own a Rivett Lathe is the natural ambition of every true mechanic, professional or amateur. 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 Lathes of the Senior Line are in very truth the master tools not only of industry, but of science as well. They are instruments themselves, and are assembled by costly processes to stand alone in the field of precision—finely wrought and finely finished.

The Rivett Junior Bench Lathe No. 507 is priced within reach of all. In presenting it we avoid the use of the word "Precision" to indicate its purpose, which is utility. It is Junior in age, not in abilities. In skilled hands it is capable of very versatile and accurate work. In average use it is adaptable and unhampered. Quality and serviceability, however, have not been sacrificed for cheapness. Low cost has been attained by making the design as simple as the function of the part will permit, by avoiding machined finish on non-working surfaces, by reducing hand labor to a minimum, and by the employment of a new and complete equipment of special manufacturing tools and fixtures, which assure uniformity and aid in lowering expense. Owners of the Rivett Junior will find it a lathe worthy of its name, of remarkable rigidity and power, with attachments for every operation and exceedingly economical to maintain,—in fact a bench lathe at least equal in all respects to any other except the Rivett Senior Line.

Amateurs, automobile mechanics, electrical repair men, inventors and small manufacturers especially, as well as toolmakers and large manufacturers generally will find that this machine will fill their bench lathe requirements for every utility purpose.

It is, therefore, without apology that we describe to you in the following pages the Rivett Junior Bench Lathe No. 507 as a fitting companion of the Rivett Senior Bench Lathes, with a definite and useful field to cover.

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The Rivett Junior Bench Lathe No. 507 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 six months after shipment.

We have attempted to make the specifications and description of the lathe and attachments so complete that our customers will have no difficulty in ordering directly from this bulletin and the published price list. We have listed in many cases the units composing typical installations illustrated, to show the method to be followed in building up an equipment, its price and weight, employing the unit system developed by us. Each attachment is a unit complete in itself, and by combining these units many outfits to suit individual requirements may be evolved. We, however, 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 Junior Bench Lathe No. 507

No machine shop, large or small, is completely equipped unless it includes at least one Rivett Junior Bench Lathe. The variety of work that can be done on it, the low initial cost, small floor or bench space occupied and little power required to drive, as well as the higher speeds and ease and fineness of adjustment make the use of the Rivett Bench Lathe more economical than a larger lathe on small parts within its range. In batteries large or small Rivett Juniors constitute long lived, uniform, and efficient producers. New in design, they embody the development of bench lathe art up to date. Completely "tooled up", they can be relied upon as to interchangeability. Correct in proportions they hold their accuracy, which inexpensive machine tools in general do not. Rivett Juniors are low in price because mass production is used to create them.

The toolmaker already appreciates the advantages of the Bench Lathe, which with its attachments may be readily set up for turning, drilling, boring, milling, grinding and other machine shop operations. Where a toolroom is equipped with a Rivett Junior Bench Lathe for each toolmaker, he is able very often, by the use of the various attachments,

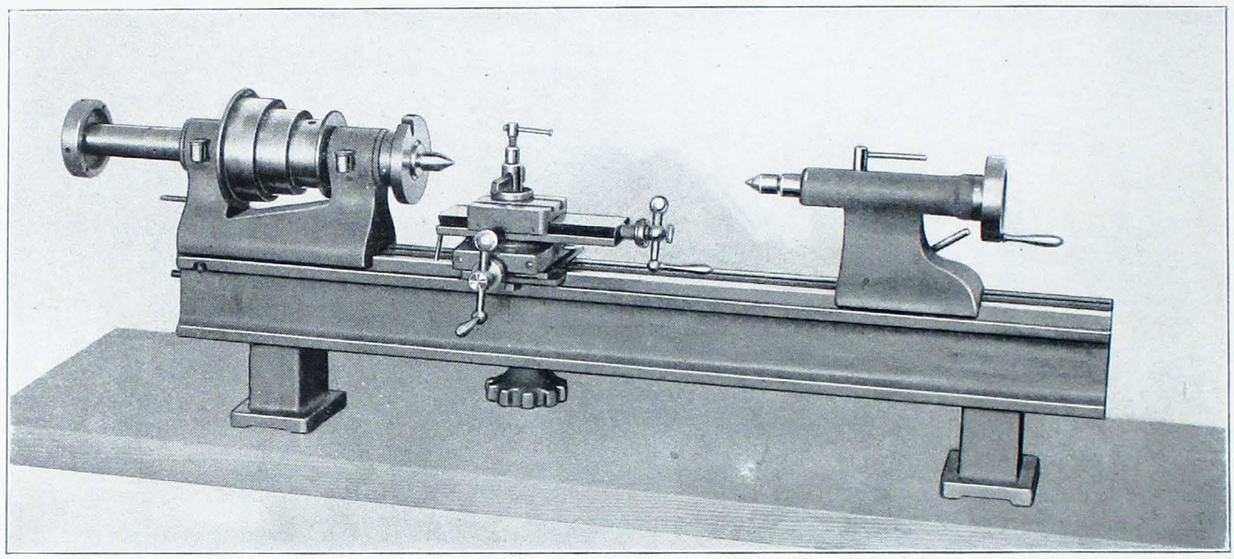

Fig. 1. Rivett Junior Bench Lathe No. 507 with Bed, Headstock, Center and Center Chuck, Screw Draw-in-Spindle, Driving Plate, Tailstock, Compound Slide Rest, and Clamping Bolt.

to make a complete jig, fixture, tool 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 Junior Bench Lathe economical for innumerable small 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 parts may be manufactured completely with an ease of set up 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 can use the Rivett Junior Bench Lathe for making the various instruments required in their work, and inventors will find it particularly desirable for building working models. When completely equipped with attachments, no other machine tool equipment will be required in many cases.

Automobile Service Stations and Electrical Repair Shops will keep their Rivett Junior Bench Lathes in almost constant use trueing commutators, undercutting the mica, making small pins, bushings, screws and other small parts.

The Manual Training Instructor will be able to teach a larger class simultaneously because of the small space occupied by the Rivett Junior Bench Lathe, and, because of the low initial cost, can afford to purchase a lathe for each student in the class. All of the elementary principles together with a large amount of advance work can be taught and practiced just as well on this small bench lathe as on a larger, more expensive tool.

The Amateur and Radio Fan will derive added joy in his home work when he himself makes the various parts he uses. The cost of an outfit is well within the range of the average pocketbook and the motor drive can be connected directly to the home lighting circuit.

To design a lathe that would adequately meet the requirements of these various groups was no small task, but our engineers, with a background of nearly forty years of bench lathe experience, have been able to produce a lathe that is a real machine tool—in no sense a toy—of simple yet rugged design, easily adjusted and manipulated, accurate and powerful. The Rivett Junior Bench Lathe No. 507 is more powerful and rigid than the bench lathe of other makes, yet it is so well proportioned that it gives one a definite sense of fleetness.

In color and finish the Rivett Junior is also the bench lathe leader of its day, and the attractive and durable gray with which the lathe itself and its attachments are painted lends individual character. The Junior not only is modern but looks modern.

HEADSTOCK

The headstock which must bear the brunt of service is of exceptionally rigid design with adequate means of adjustment to maintain a true running spindle. The most striking feature is the external taper on the spindle nose instead of the conventional threads. The taper, which has a 5° included angle, $^{29}/_{32}$″ long and 1.7334″ diameter on the small end, allows face plates, chuck plates, jaw chucks and other headstock spindle attachments to be mounted and remounted with positive assurance of running true. The friction between the tapered surface of the spindle and the tapered hole in the plate, as a means of holding the plate on, is supplemented by two cone-point screws in the plate, which contact with the reverse 45° angle taper directly back of the tapered spindle nose. The effectiveness of the screws is surprising, a light contact holding the plate immovably in place. It is impossible for the plate to slip or to come off, even when turning on a piece of stock extending a great distance from the chuck plate. This unique design is equally effective for both directions of rotation,—a distinct advantage over the threaded spindle nose on which the chuck or plate is apt to loosen when rotated in the opposite direction to the thread. The surfaces are easily cleaned, doing away with the possibility of a small piece of grit throwing the plate out of alignment. As the plates are retained by the two locking screws rather than by a collet-shaped projection entering the headstock spindle, the full diameter of the hole in the spindle is available for the insertion of bar stock.

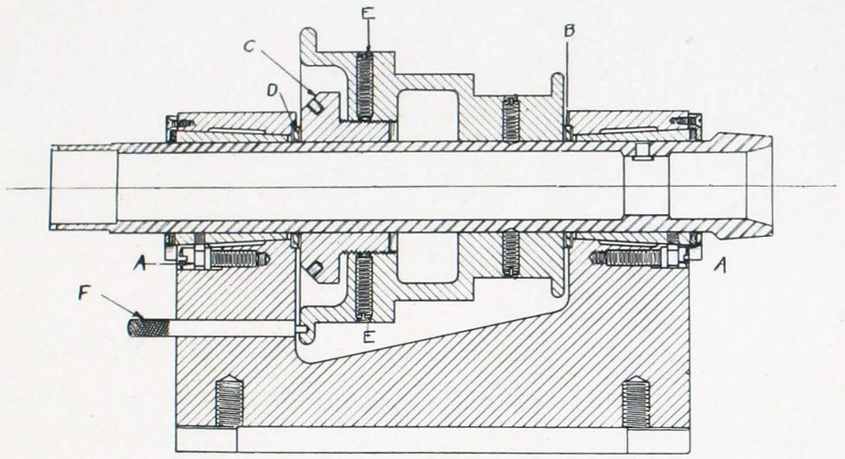

Fig. 2. Sectional Drawing of Headstock Showing Construction.

The spindle is made of tool steel, hardened on the front end for the chuck and collet seat, and ground all over externally and in the mouth to take Rivett No. 7 Collets, which have a maximum capacity of $^{3}/_{4}$″ round, $^{17}/_{32}$″ square, and $^{21}/_{32}$″ hexagon holes. The hole in the headstock spindle at its smallest diameter is 1″, but as the key which prevents the collets from turning projects into this space the maximum size of stock which can be passed through the headstock spindle, when held centrally in a jaw chuck, is $^{7}/_{8}$″. The headstock is scraped to a true fit on the bed and is bolted by two studs passing through the bed. The bearing boxes are made of cast iron with straight holes, but are tapered on the outside, and are split, so that when drawn into the headstock casting by means of screws "A", they are compressed, thus providing a take-up for side shake. The tool steel spindle running in the cast iron bearings soon glazes the bearings to a hard glasslike surface similar to the cylinder walls in an automobile engine. Wear thereafter is almost negligible. The bearings are oiled by elbow oil cups on the side of the headstock casting, applying oil at the proper place, that is, at the point of greatest clearance. Each oil cup has a wick which lies in a slot in the bearing, providing constant and adequate lubrication without flooding and consequent waste of oil. End thrust is taken in one direction by the front end of the pulley and washer "B" with its two accompanying fibre washers, and in the other direction by the face of adjusting nut "C" and washer "D" and its accompanying fibre washers. To adjust the headstock, therefore, loosen the two adjusting nut lock screws "E", and by means of a small pin inserted in one of the holes in adjusting nut "C", turn that nut until all end shake is removed; after which tighten screws "E".

The three-step pulley has steps 3″, 3¾″ and 4½″ diameter, each step $1^{9}/_{32}$″ wide for belt 1¼″ wide. The face of the large flange has 60 drilled holes, engaged by pin "F", to prevent the spindle from turning when tightening chucks, and as a means for indexing.

Net Weight 25 lbs.

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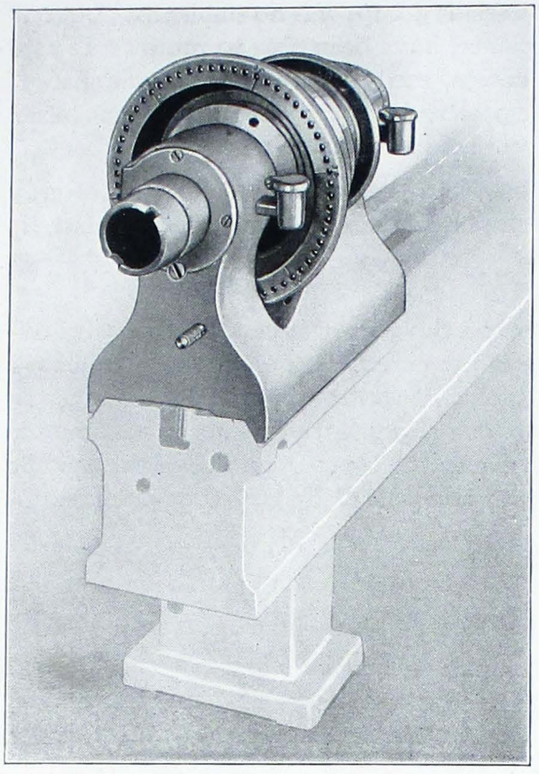

Fig. 3. Lathe Bed—Headstock End.

BED

The bed, with legs cast integral, is made of close grained cast iron in box section, strongly ribbed to give maximum strength with light weight. The bottom of the legs, the surface of the long boss on the under side of the bed, the left hand end of the bed and the top of the bed are machined. The castings are then allowed to season for a period of time to remove all stresses and strains in the metal. Afterward, the top of the bed is finish machined, and hand scraped to standard gauges, so that all attachments fitting on the bed are interchangeable. Every bed is machined and drilled for the screw cutting attachment which may be furnished either at the time of ordering the lathe, or later.

In setting up the lathe the bench surface should be as even as possible, compensation for any irregularities being made by pieces of paper or cardboard placed under the lathe feet. The bolts holding the bed to the bench should be tightened enough to hold firmly, but not so excessively as to put undue strain on the casting. A bench lathe, if possible, should be located in a position where the sun does not shine on it and where it is not subject to extremes in temperature. Carelessness in these respects may throw the bed out of alignment. The standard equipment with the bed includes the studs, nuts and washers for fastening it to the bench.

Net Weight, 77 Lbs.

TAILSTOCK

The tailstock is of the offset type giving ample clearance for the compound slide rest feed screw handle when working on short work of small diameter. 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 3⅜″ and is effected by means of a hand wheel 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 operating a friction bushing. Most tailstocks are split and the spindle is locked by bringing together the sections of the tailstock casting. A "split" hole in which a spindle runs cannot very long remain round and clamping in this manner soon throws the tailstock center out of alignment. But, in the Rivett Junior tailstock the casting is not split, the hole being reamed straight and true, which assures accurate alignment for a long period. The tailstock is scraped to perfect alignment with the headstock, master gauges being employed throughout, 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 spindle has a single measuring line etched on it, so that holes can be drilled and counterbored to the desired depth by measuring with a steel rule. The standard equipment of the tailstock includes a hardened male center.

Net Weight, 14 Lbs.

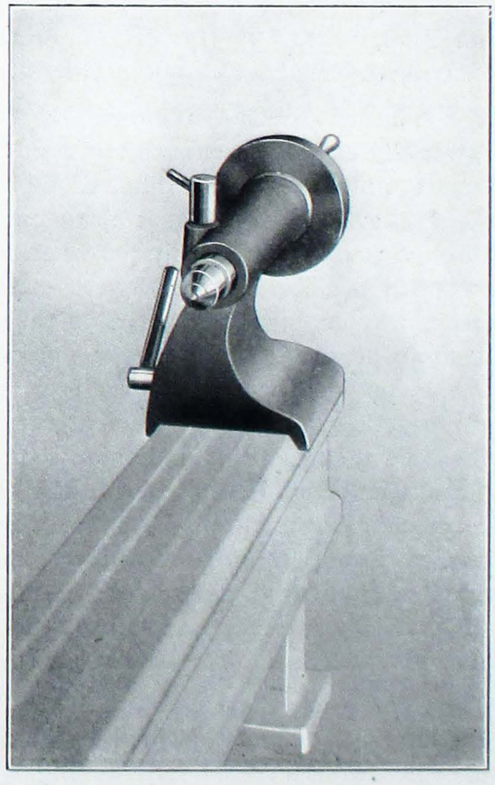

Fig. 4. Tailstock.

COMPOUND SLIDE REST

The compound slide rest consists essentially of two slides with a graduated swivel between them, and feed screws to provide the slide movements. The base has four flat hand-scraped, bearing surfaces so that the slide rest will bear truly and firmly on the bed. It is quickly clamped in position by means of the clamping bolt, shown in Fig. 101, engaging a T slot in the base and passing through the bed. Adjustable as to position in the T slot is a guide plate 4″ long which is scraped square on the surface coming in contact with the front bevel of the bed. This guide plate permits the slide rest being quickly set and re-set in proper alignment no matter how many times the rest is removed from the lathe. As this guide plate is movable along the T slot, adjustments can be made to set the slide rest with maximum forward overhang for large diameter work, or to the rear so that the cutting tool can be passed back of the center line,—a valuable feature. When the guide is not used, the feeds may be set at two independent angles.

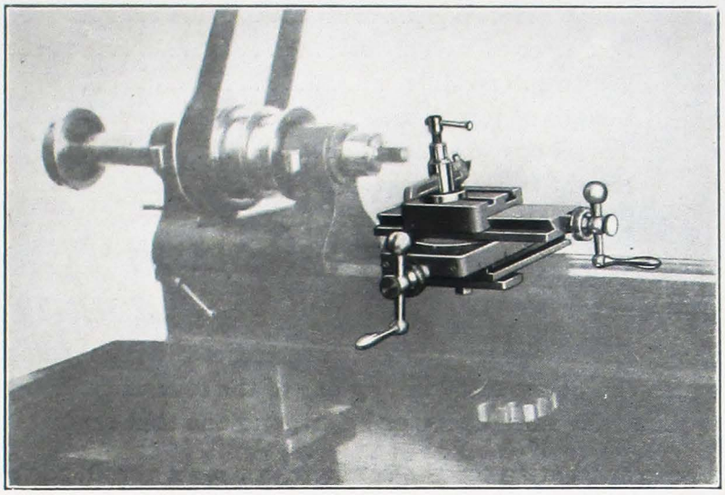

Fig. 5. Compound Slide Rest.

The swivel is locked in position on the cross slide by an eccentric binder. The graduations are cut on the dial in degrees, 45° both sides of 0, but three reading lines are inserted in the cross slide so that full 360° may be read, in other words, the graduations are always in contact with one of the three "lubber" lines. The graduations are clearly cut and accurately spaced on a bevel so as to be in line with the eye.

Two T slots, instead of the conventional one slot, are machined in the top slide so that the tool holder may be mounted to give the least tool overhang, depending on the position of the slide and work to be done. The top slide with its two T slots is convenient for strapping work to be milled or drilled, for carrying the index head of milling attachment (see Fig. 79), for mounting the vise (see Fig. 83), for mounting the angle iron (see Fig. 76), and for mounting the grinding attachments (see Figs. 67 and 72).

The tool post is of the standard rocker type, the rocker and the clamping screw being hardened.

The feed screws are made of machine steel and work in bronze nuts of large size. The thread is 10 pitch special 29°. End thrust is taken by a shoulder on the screw against the end plate in one direction and by the dial and indicator flange in the other. Adjustment is made by moving the dial along the axis of the screw.

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 screw in the center of the ball handle.

The ball handles are of convenient size for rapid movement and sensitive touch and do not interfere with each other, except when the compound slide is set less than 45° from the axis of the cross slide, a situation which can be overcome by using another setting to obtain the same angle.

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

The dovetails of the slides are hand scraped to an accurate fit and are provided with gibs for adjustment. The gib for the top slide is 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 chance entrance of chips. The slide rest is a sturdy versatile unit designed and 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 those customers desiring it.

COMPOUND SLIDE REST—Continued

SPECIFICATIONS

Width of base	3¼"
Length of base	5¾"
Length of guide plate	4"
Width of cross slide	3½"
Length of cross slide	7¼"
Travel of cross slide	4⅜"
Width of swivel	2¾"
Length of swivel	7¼"
Diameter of swivel dial	4"
Width of top slide	3¼"
Length of top slide	3¼"
Travel of top slide	5"
Height to top of top slide	3 1/16"
Size of tool holder, maximum	⅜" x ½"

Net Weight, 15 Lbs.

COUNTERSHAFT

The design of the countershaft overcomes the usual defects of bench lathe countershafts by providing a single unit which can be mounted in any one of the several desired positions without change, one that can be driven by belts approaching from above or below, and one that requires little or no attention.

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 on the ceiling, the treadle wires should be run over small pulleys in order to pull the belt shifters properly. (See Fig. 20).

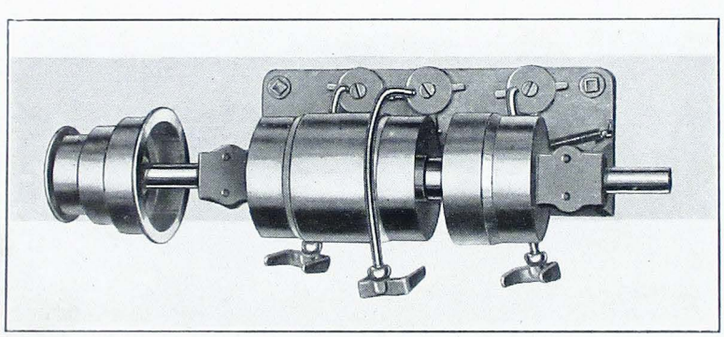

Fig. 6. Three-Speed Countershaft.

If the belt drive is from overhead, as from a lineshaft, 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 shifter fork swivels each have two drilled lugs for the treadle wires, one of which imparts proper motion when the countershaft is mounted in one position, the other when the countershaft is in the reverse position.

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 countershaft base and bearing brackets are cast in one piece and the whole is jig machined, so that positive alignment is assured. The shaft bearings and loose pulley bearings are fitted with oilless wood bushings, requiring no oiling or attention whatsoever. The pulleys are machined all over and carefully balanced to run noiselessly and without vibration.

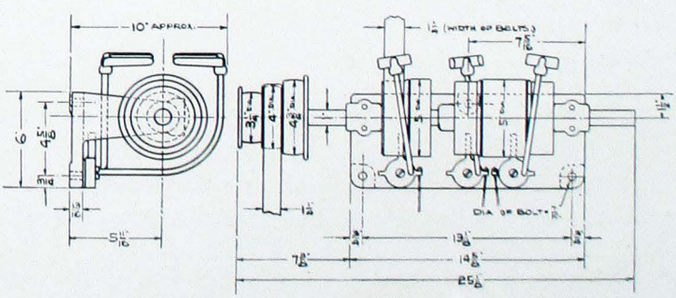

Fig. 7. Countershaft Dimensions.

COUNTERSHAFT—Continued

Three loose pulleys are provided. It is customary to belt the left pulley to run forward at 300 RPM, the middle one backwards at 300 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 individual requirements.

Net Weight, 45 Lbs.

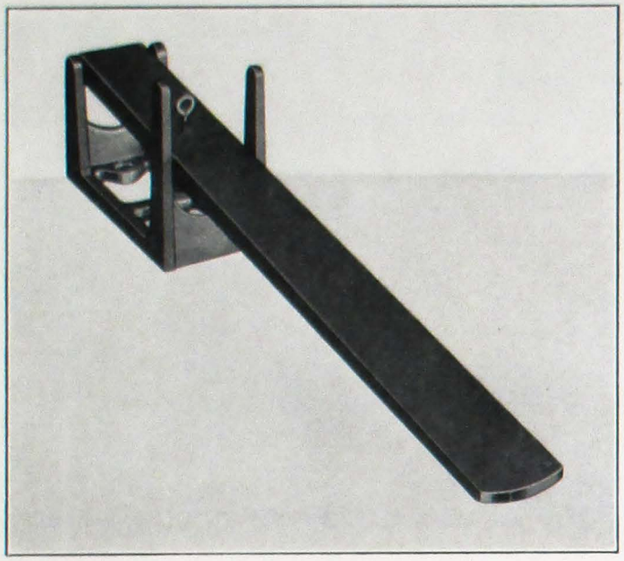

Fig. 8. Treadle.

TREADLES

The belt shifters on the countershaft are operated by foot treadles bolted to the floor, connected by soft iron wires or light chains except when the cabinet is used. The cabinet is furnished with built-in, hand control shifters. Each treadle assembly consists of a cast iron bracket carrying a wooden foot piece. Three treadles are required for complete control of the countershaft.

Net Weight (set of three), 16 Lbs.

GRINDING COUNTERSHAFT

The grinding countershaft is an attachment for the lathe countershaft, and is used for driving the grinding attachments. Its brackets are fastened by cap screws to the machined ends of the lathe countershaft brackets, and as all parts are jig drilled, perfect alignment is assured. All bearings, including the two shaft bearings, belt tightener pulley bearing, and belt tightener arm bearing, are fitted with oilless wood bushings. The large grooved pulley may be located in any desired position on the shaft by loosening the set screw in the right hand boss, after which it is tightened to drive with the shaft. The belt tightener arm is equipped with an adjustable counterweight to provide the right belt tension and to prevent belt-whip. A pulley for the lathe countershaft to drive the grinding countershaft is furnished. These drive pulleys may be reversed to give extra speed changes.

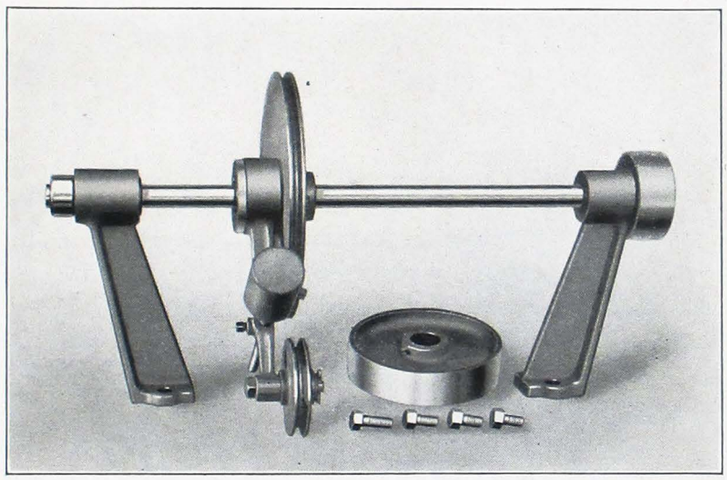

Fig. 9. Grinding Countershaft.

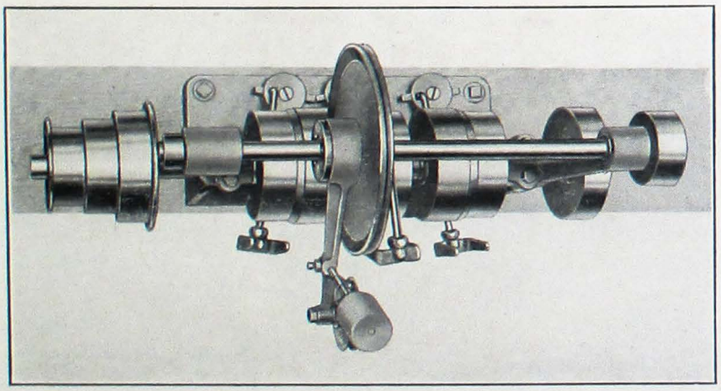

Fig. 10. Grinding Countershaft.—Installed on Lathe Countershaft.

SPECIFICATIONS

Diameter of pulley on lathe countershaft . . . 5″
Diameter of driven pulley . . . . . 3″
Pitch diameter of large grooved pulley . . . . . $7\frac{11}{16}$″
Speeds of large grooved pulley at standard countershaft speeds (RPM) 180-420-500-1160

Net Weight, 18 Lbs.

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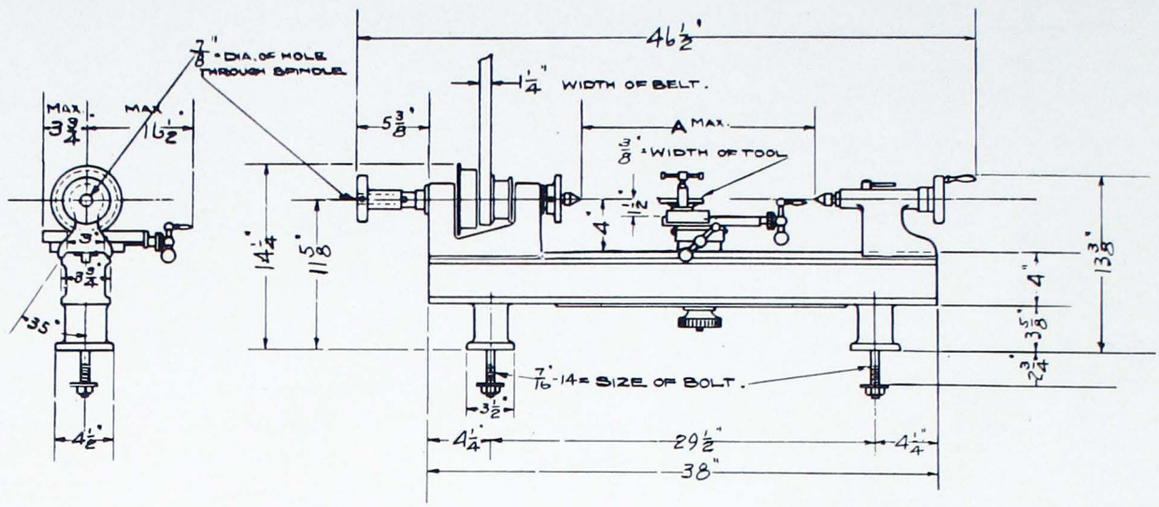

Fig. 11. Principal Dimensions of the Lathe.

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″
Diameter of largest piece of round stock that can be passed through headstock when held in jaw chuck	7/8″
Maximum diameter of round hole in collet	3/4″
Maximum size of square hole in collet	17/32″
Maximum size across flat of hex. hole in collet	21/32″
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 7/8″
Swing over top of bottom slide of compound rest, diameter	5″
Diameters of steps of cone pulley	3″, 3¾″, 4½″
Number of index holes in headstock pulley	60
Taper of headstock spindle nose, included angle	5°
Diameter of taper at small end	1.7334″
Length of taper	7/8″

TAILSTOCK

Diameter of spindle	1″
Taper in mouth of spindle, special	3° approx.
Diameter of taper at mouth of spindle	541″
Travel of spindle	3⅜″

SPECIFICATIONS—Continued

SLIDE REST

Travel of top slide	5″
Travel of cross slide	4 3/8″

COUNTERSHAFT

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

SPEEDS

Countershaft tight pulley, forward and reverse (RPM)	300
Countershaft tight pulley, high speed (RPM)	700
Headstock spindle (RPM)	216, 320, 475, 500, 750, 1100

WIDTH OF BELTS

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

WEIGHT

Combination, consisting of bed, headstock, center and center chuck, draw-in-spindle, driving plate, tailstock with center, compound slide rest with rocker tool post, clamping bolt, countershaft, and three treadles.

Net	200 lbs.
Gross	260 lbs.
Dimensions of Shipping Case	21 1/2″ x 16 1/2″ x 46 1/2″

COMMON METHODS OF MOUNTING AND DRIVING

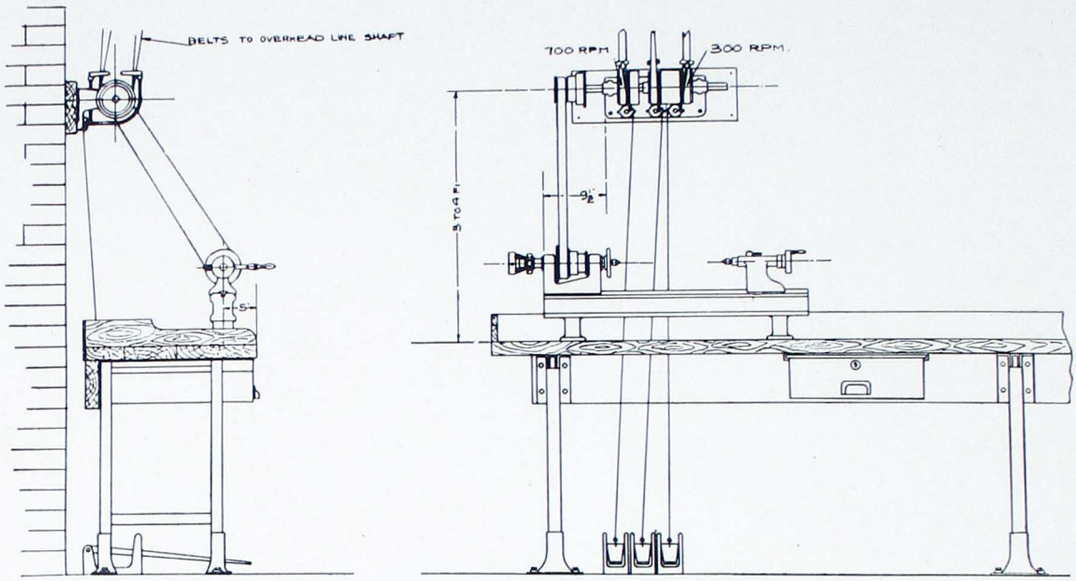

Fig. 12. Lathe on Wall Bench, Countershaft on Wall, Drive from Overhead Lineshaft.

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 in his shop. It is important, however, that this point be settled before the order is made out, so that the correct equipment is specified. In order to assist our customers in selecting the method of mounting and driving which will suit their space and sources of power to the best advantage, we submit the twelve accompanying line cuts showing commonly used layouts. These cuts are in sufficient detail to serve as erecting diagrams, particularly when considered in conjunction with Figs. 7 and 11.

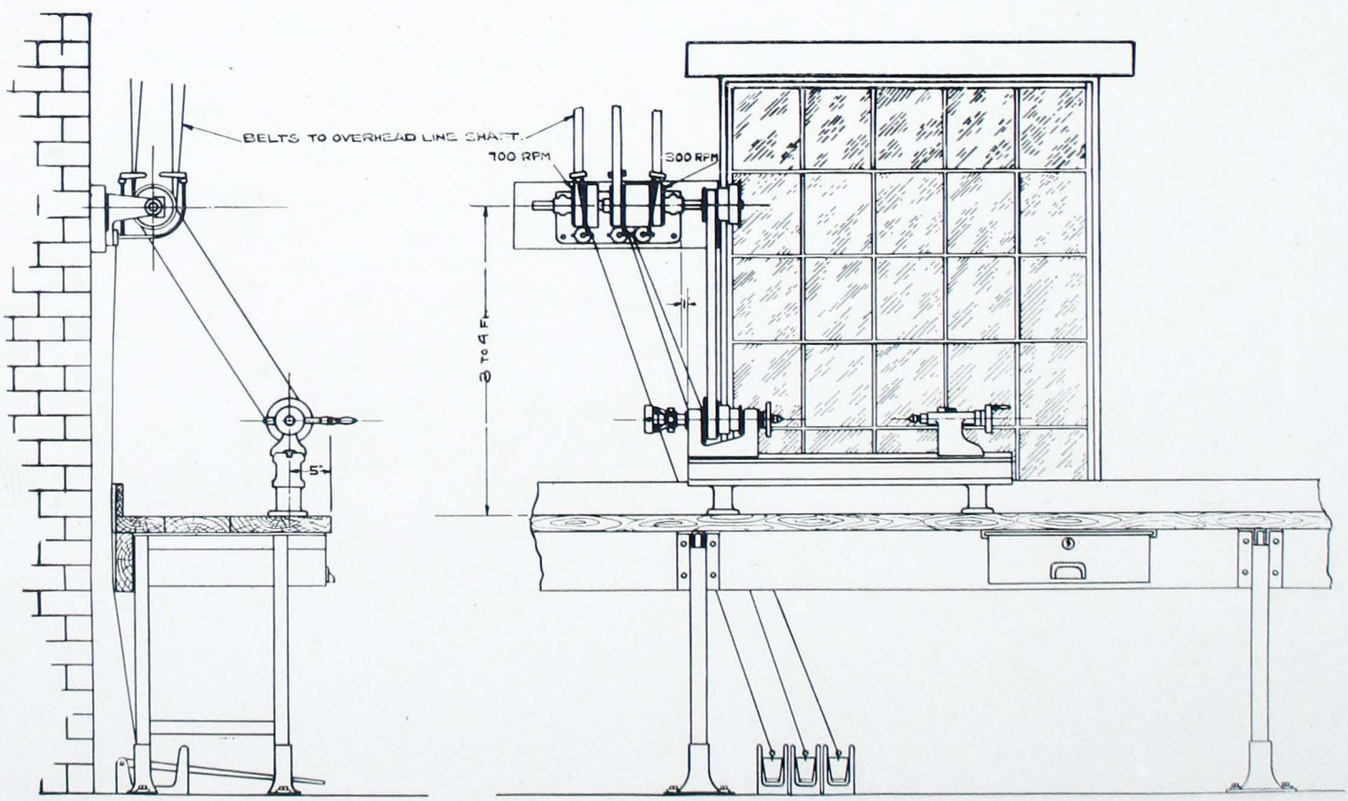

Fig. 13. Lathe on Wall Bench in front of Window, Countershaft on Wall, Drive from Overhead Line Shaft.

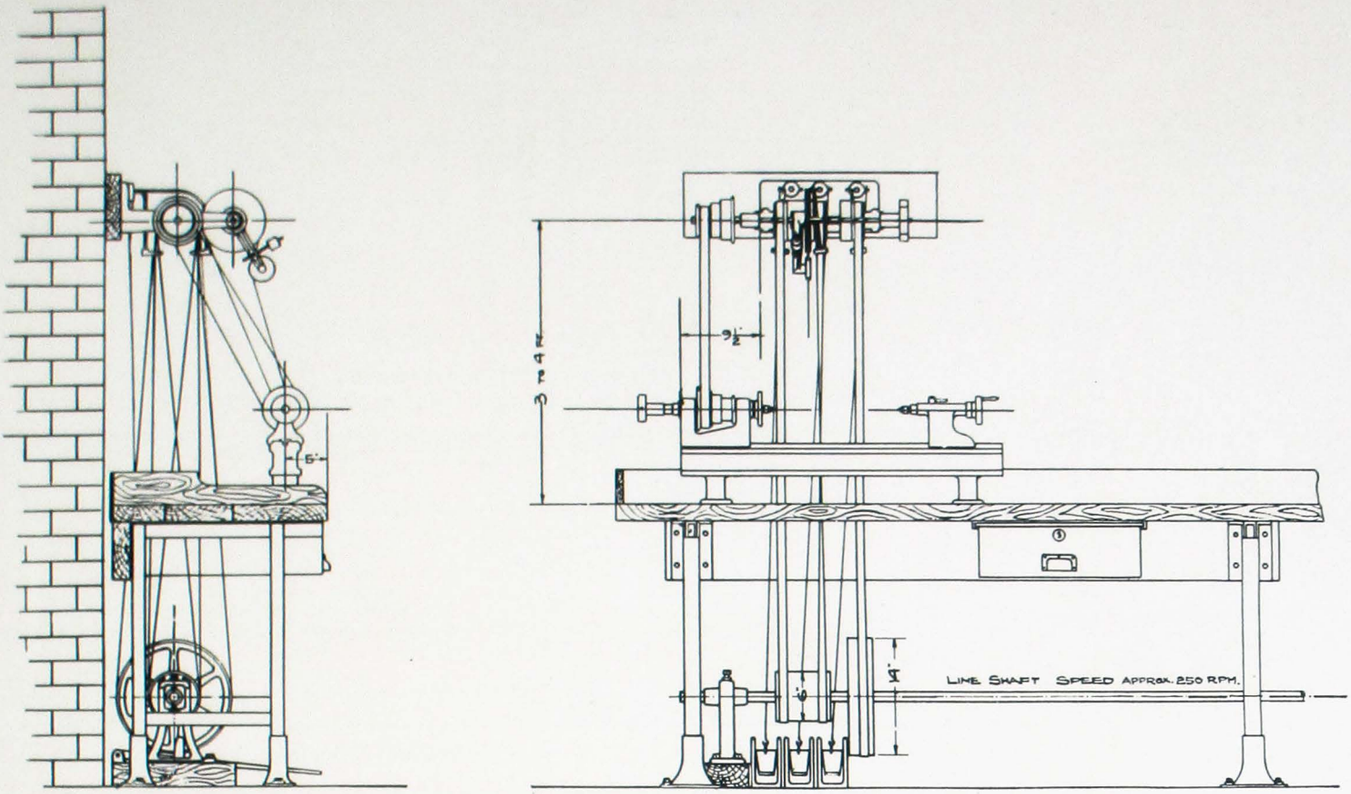

Fig. 14. Lathe on Wall Bench, Countershaft on Wall, Drive from Lineshaft underneath Bench.

These arrangements can be extended for a group of lathes by substituting for the jackshaft, driven by the individual motor, a line shaft with pulleys of proper size, the line shaft and complete group of lathes being driven by a single motor. To figure the size of motor required it will be safe to assume 3/8" H. P. for each lathe.

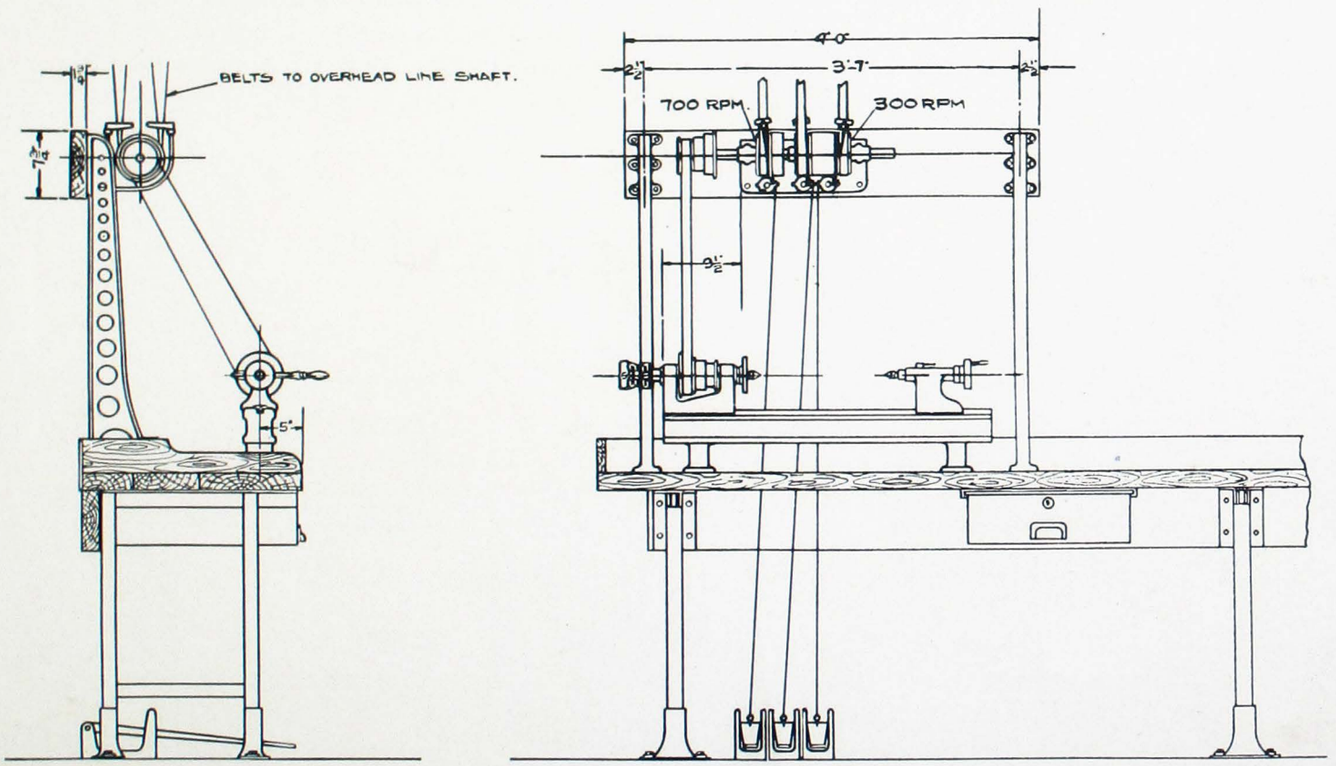

Fig. 15. Lathe on Bench away from Wall, Drive from Overhead Lineshaft.

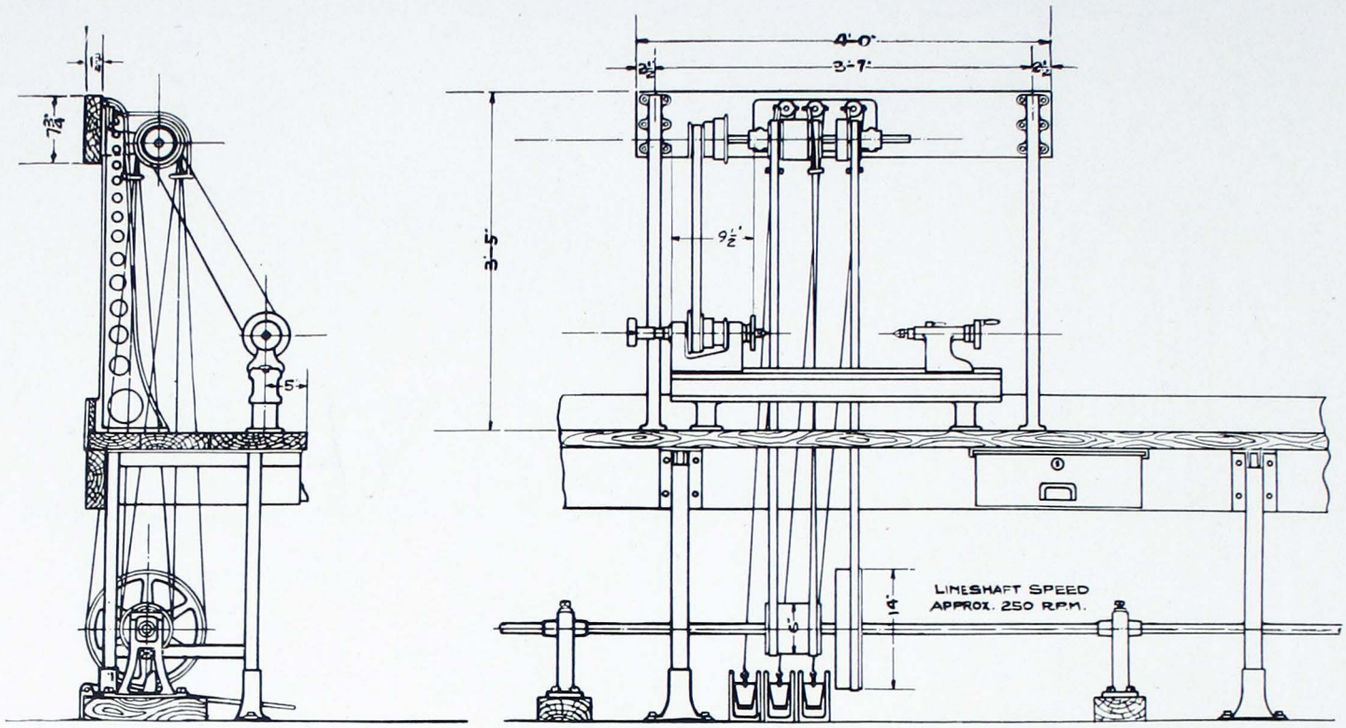

Fig. 16. Lathe on Bench away from Wall, Drive from Underneath Lineshaft.

Fig. 18 indicates a very desirable method of mounting and driving for a single unit, either in the large shop or toolroom, or private workshop. This unit is more completely shown by Fig. 34. Fig. 19 represents a very handsome and complete installation for a laboratory or private workshop. This is more completely shown by Fig. 41.

Figs. 20 and 21 outline the oil pan and floor leg mounting which is much used when the lathe is equipped with turret attachment and cutting off and forming slide to make a hand screw machine. The oil pan and floor legs may also be effectively used, if desired, with a general purpose lathe equipped with compound slide rest and other attachments. The oil pan and floor legs are more completely shown by Figs. 43 and 44.

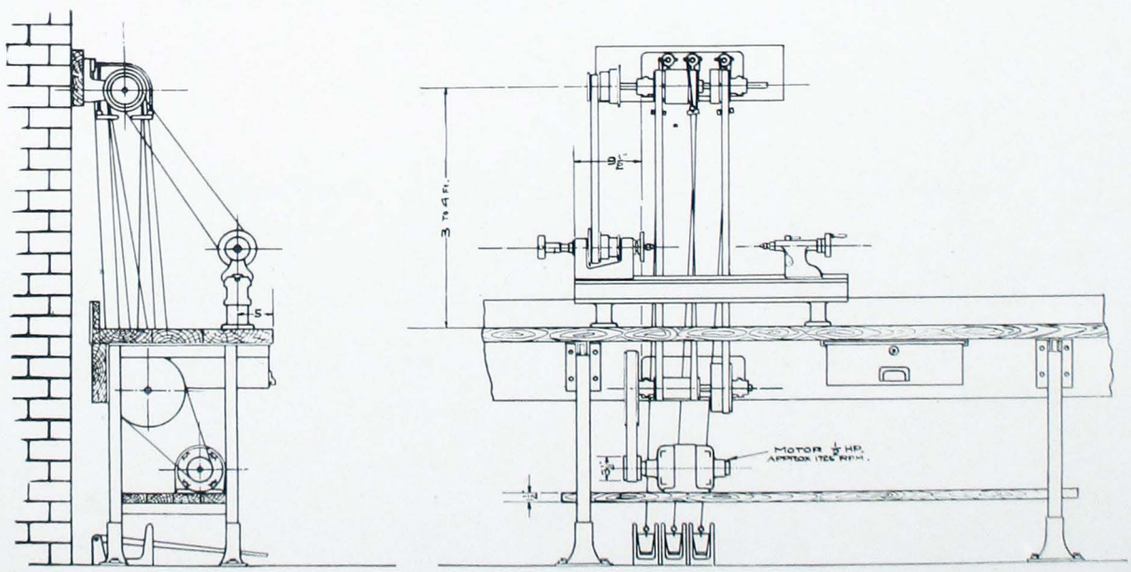

Fig. 17. Lathe on Wall Bench, Countershaft on Wall, Individual Motor Drive.

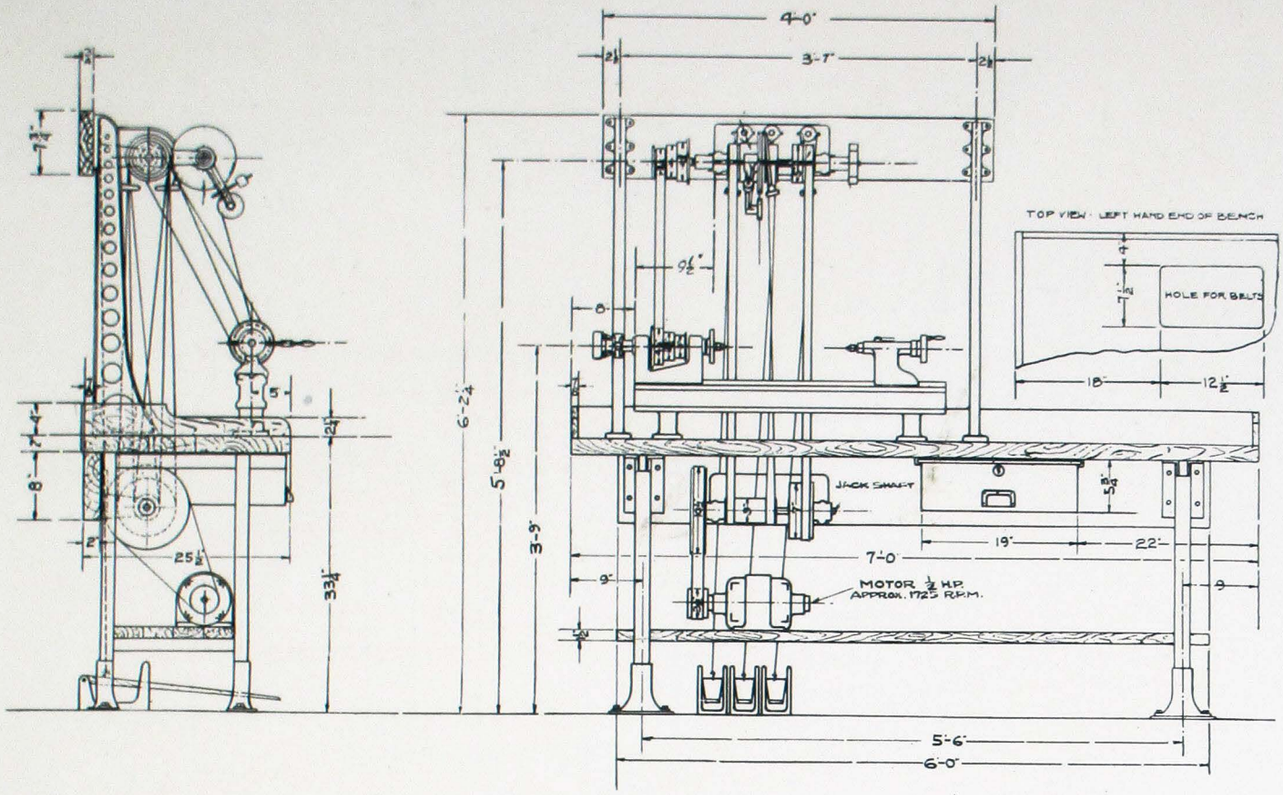

Fig. 18. Lathe on Unit Bench, Individual Motor Drive.

Figs. 22 and 23, showing a double bench with countershafts driven from either an overhead lineshaft or from an underneath lineshaft with one motor for the group, are layouts which make the most economical use of space, and

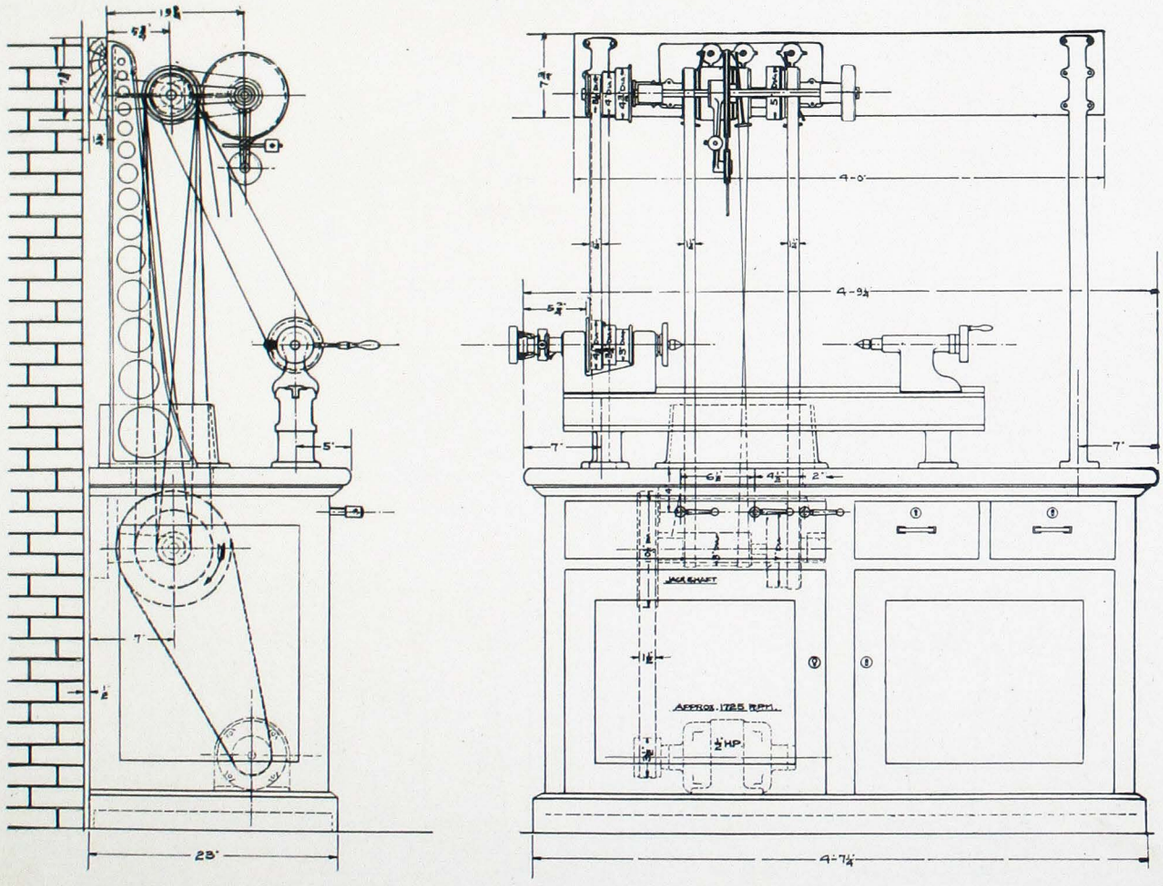

Fig. 19. Lathe on Cabinet, Individual Motor Drive.

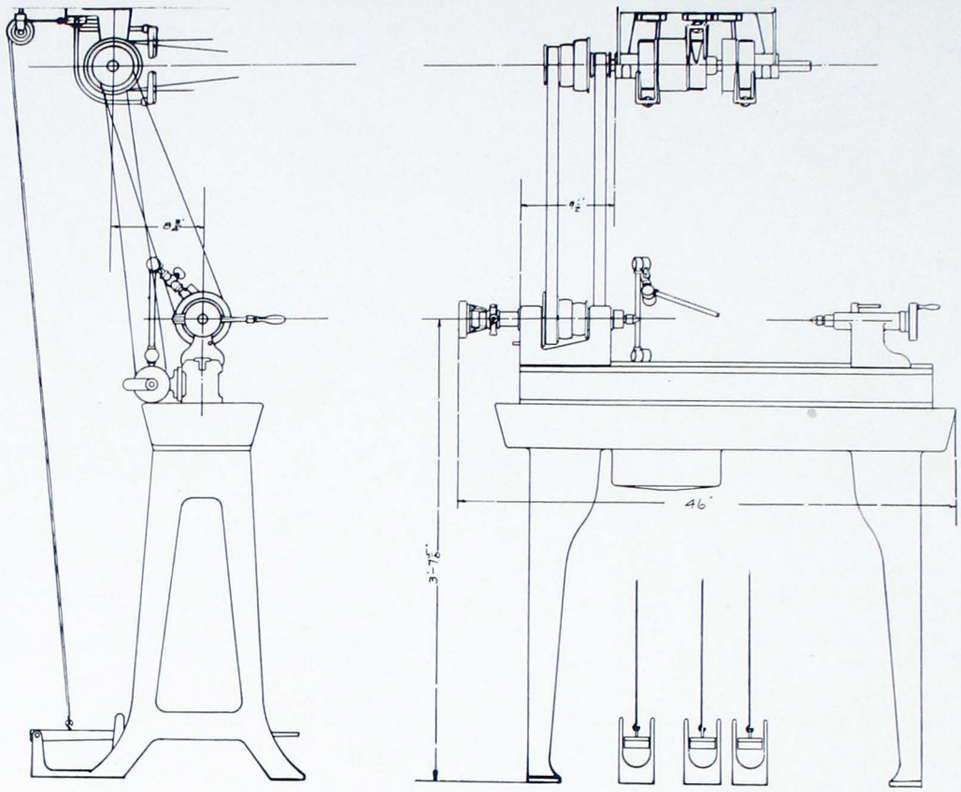

Fig. 20. Lathe on Pan and Floor Legs, Countershaft on Ceiling, Drive from Overhead Lineshaft.

are particularly desirable for manufacturing departments and manual training schools. Bench tops, line shafting and hangers are not furnished by us, as these bulky articles can be more advantageously procured locally. The cast iron uprights for supporting countershaft planking, as in Figs. 15, 16, 18, 19, 21, 22, and 23 are made by us and more fully shown by Fig. 39.

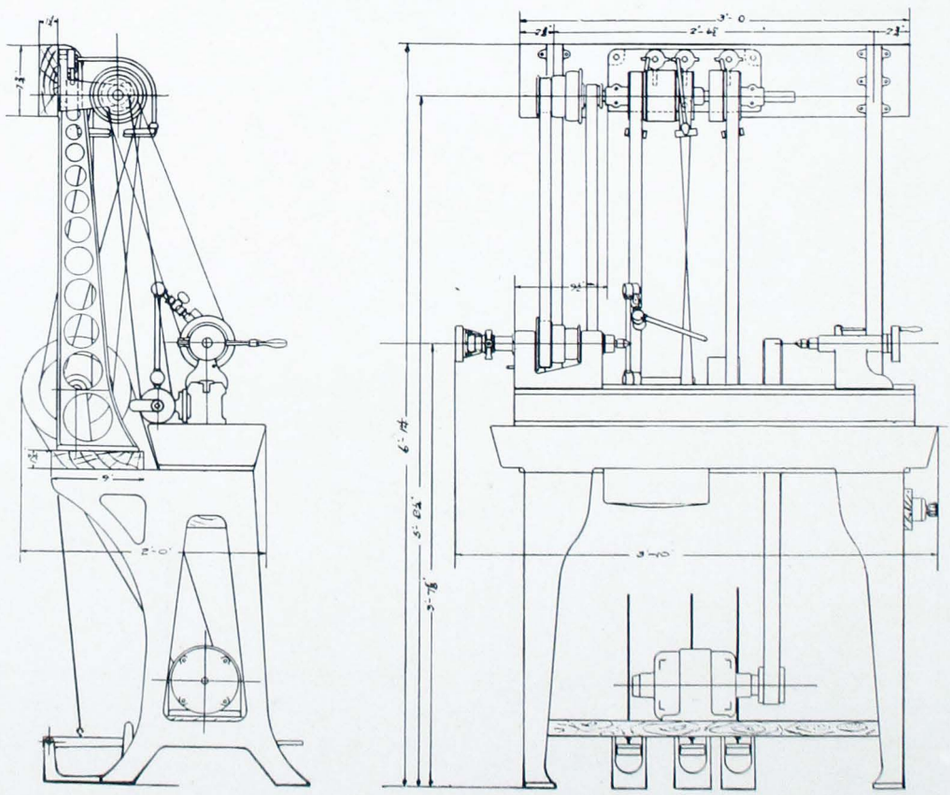

Fig. 21. Lathe on Pan and Floor Legs, Individual Motor Drive.

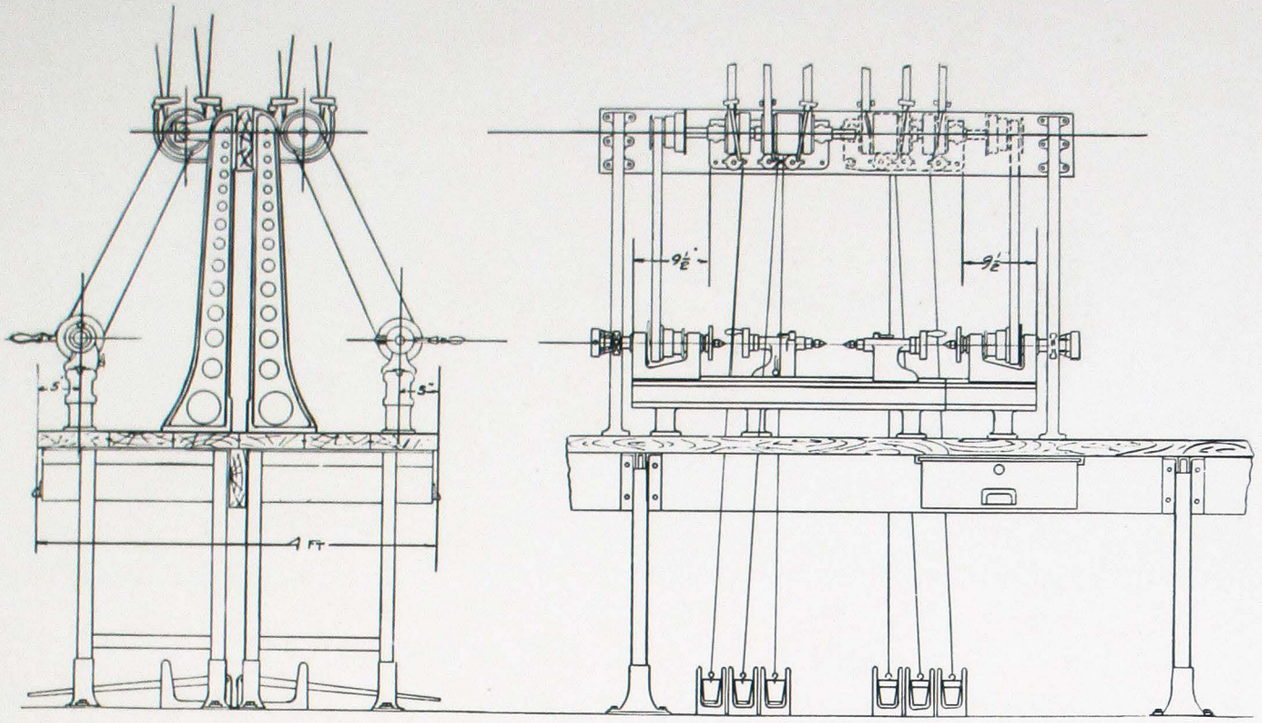

Fig. 22. Group of Lathes on Double Bench, Drive from Overhead Lineshaft.

Jackshafts for individual motor drive, as in Figs. 17, 18, 19 and 21, are more fully shown by Fig. 40.

Bench legs and bench drawer, as in Fig. 18, are more fully shown by Figs. 35, 36 and 37.

The size of motor for single unit, as shown in Figs. 17, 18, 19 and 21 should be ½ H. P., constant speed, 1700-1800 RPM with standard pulley 3¼" or 3½" diameter with sliding base and suitable starting device, selected from the number of types and makes available.

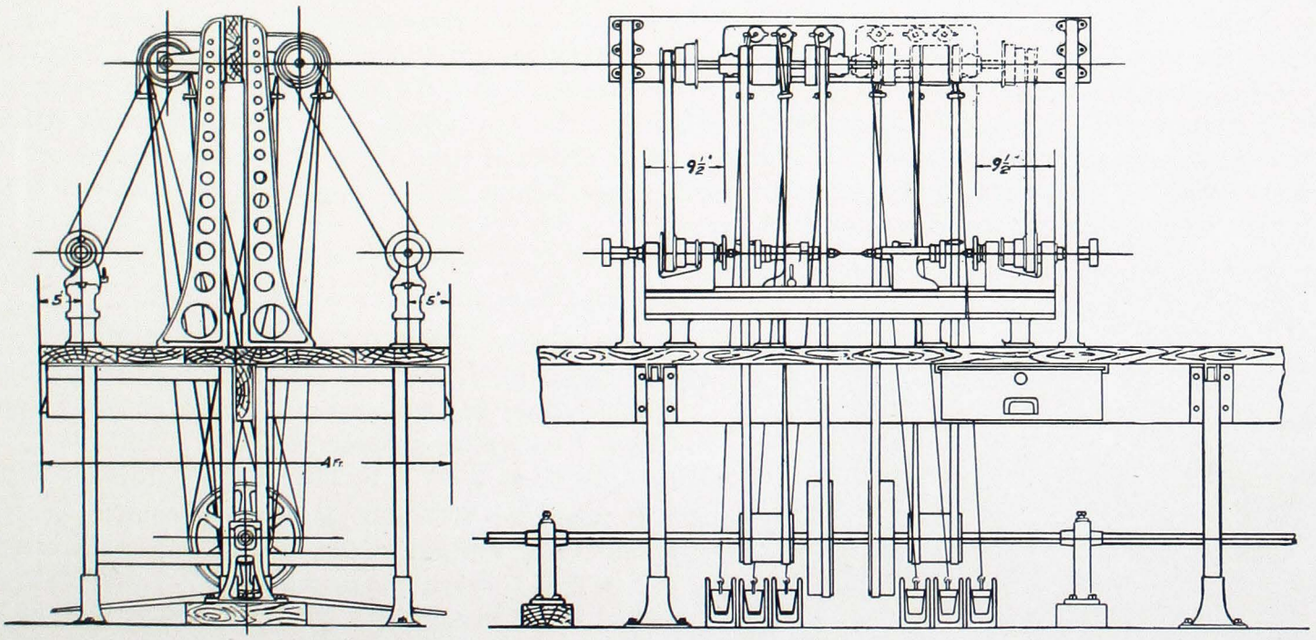

Fig. 23. Group of Lathes on Double Bench, Drive from Underneath Lineshaft with One Motor for Group.

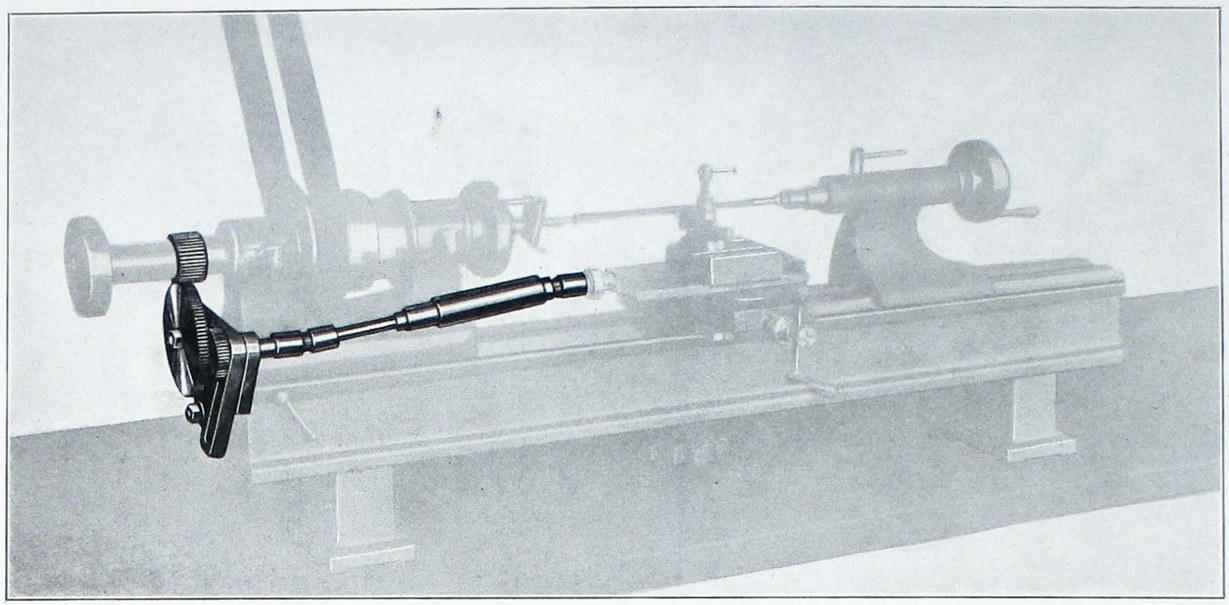

Fig. 24. Thread Cutting Attachment Installed on Lathe.

THREAD CUTTING ATTACHMENT

This is a practical attachment for cutting threads, either right or left hand, internal or external. It can be used, also, as a power feed for straight and taper turning and boring. The upper slide rest screw is utilized as a lead screw, and therefore the maximum length of thread that can be cut is the travel of the top slide, which is 5″. The connection, however, is a telescopic joint with sufficient length to reach a "between center" distance of 14″. Every lathe is machined to take this attachment, whether it is ordered originally with the lathe or not.

The attachment consists, essentially, of a 40 tooth gear fastened to the headstock spindle by two set screws; a swinging change gear quadrant and quadrant bracket mounted on the end of the bed on a stud, nut and washer provided; an eccentric binder and T bolt for locking the quadrant bracket in the desired position; a set of change gears for a large range of threads; two studs for carrying the compound and idler gears, and a telescopic shaft with universal joints for connecting the change gear shaft to the upper slide rest screw.

To set up the thread cutting attachment, the swivel slide of the compound slide rest is turned to bring the ball handle to the headstock side. The ball handle is then removed and the telescopic joint connected in its place, care being taken to see that the spacing washer lies snugly between the joint and the dial, to obviate end play in the screw. Depth of cut is regulated by the cross feed of the slide rest in connection with the adjustable stop. At the end of the thread the lathe is reversed by operating the treadles. Pitches of threads or rates of longitudinal feed are determined by the gear trains on the quadrant in accordance with the tables given on the following pages. It will be seen that this thread-cutting attachment is based on the same principles as any screw cutting lathe. It interferes in no way with the operation of the lathe on other classes of work and may be quickly disconnected or removed entirely. A similar attachment (the set of gears being different) can be supplied for cutting metric threads and is used with a slide rest having metric feed screws.

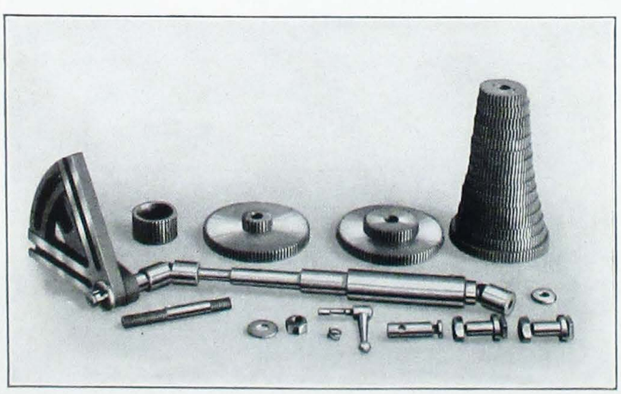

Fig. 25. Thread Cutting Attachment.

SPECIFICATIONS

Maximum length of threads which can be cut . . . . . 5″

Distance between lathe centers reached by attachment . . 14″

Set of Gears for ENGLISH attachment consists of: 40 T Spindle Gear, 96-48 Compound Gears, 96-24 Compound Gears, 1 each Change Gears, 40 T, 44 T, 46 T, 48 T, 50 T, 52 T, 54 T, 56 T, 60 T, 64 T, 68 T, 72 T, 76 T, 80 T, 90 T.

Set of Gears for METRIC attachment consists of: 40 T Spindle Gear, 86 T Idler Gear, 1 each Compound Gears with pins 64 T, 96 T, 1 each Compound Gears 24 T, 36 T, 42 T, 48 T, 56 T, 1 each Change Gears, 32 T, 35 T, 40 T, 50 T, 80 T.

Net Weight, 16 Lbs.

THREAD CUTTING GEAR TABLES

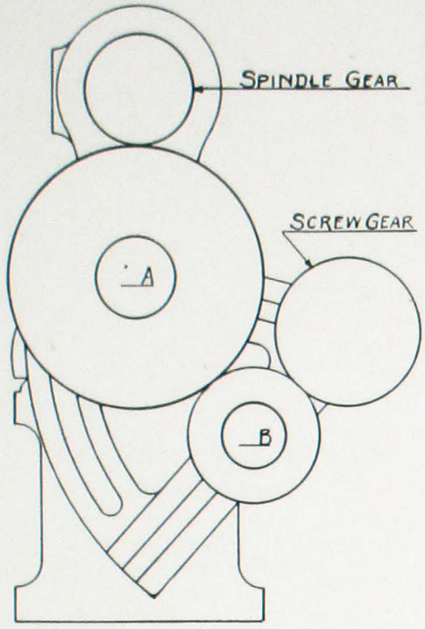

Fig. 26.

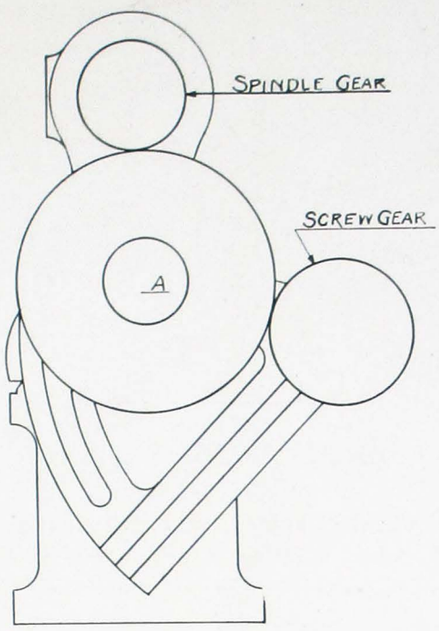

Fig. 27.

RIGHT HAND THREADS

Not Compounded

Mesh Idler A with spindle gear and Idler B. Mesh Idler B with screw gear and Idler A. Place gears smaller than A and B on same studs as spacers.

Threads per in.	*Spindle Gear*	*Idler A*	*Idler B*	*Screw Gear*
10	40	96	48	40
11	40	96	48	44
11½	40	96	48	46
12	40	96	48	48
13	40	96	48	52
14	40	96	48	56
15	40	96	48	60
16	40	96	60	64
17	40	96	64	68
18	40	96	68	72

LEFT HAND THREADS

Not Compounded

Use for Idler A the 96 T Compound gear with 24 T gear on same stud as spacer. Mesh 96 T gear with spindle and screw gears.

Threads per in.	*Spindle Gear*	*Idler A*	*Screw Gear*
10	40	96	40
11	40	96	44
11½	40	96	46
12	40	96	48
13	40	96	52
14	40	96	56
15	40	96	60
16	40	96	64
17	40	96	68
18	40	96	72
19	40	96	76
20	40	96	80
22½	40	96	90

THREAD CUTTING GEAR TABLES —Continued

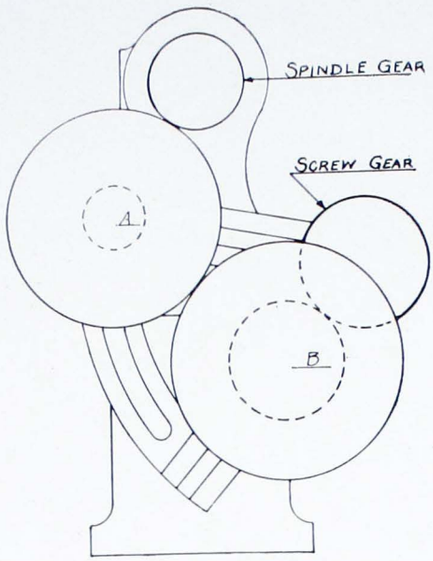

Fig. 28.

RIGHT HAND THREADS
Compounded

Mesh Idler A with spindle gear and large gear of Compound B. Mesh small gear of Compound B with screw gear. Use any small gear on stud with Idler A as a spacer.

Threads per in.	*Spindle Gear*	*Idler A*	*Compound B*	*Screw Gear*
20	40	90	96–48	40
22	40	90	96–48	44
23	40	90	96–48	46
24	40	90	96–48	48
25	40	90	96–48	50
26	40	90	96–48	52
27	40	90	96–48	54
28	40	90	96–48	56
30	40	90	96–48	60
32	40	90	96–48	64
34	40	90	96–48	68
36	40	90	96–48	72
38	40	90	96–48	76
40	40	90	96–48	80
40	40	90	96–24	40
44	40	90	96–24	44
46	40	90	96–24	46
48	40	90	96–24	48
50	40	90	96–24	50
52	40	90	96–24	52
54	40	90	96–24	54
56	40	90	96–24	56
60	40	90	96–24	60
64	40	90	96–24	64
68	40	90	96–24	68
72	40	90	96–24	72
76	40	90	96–24	76
80	40	90	96–24	80
90	40	80	96–24	90

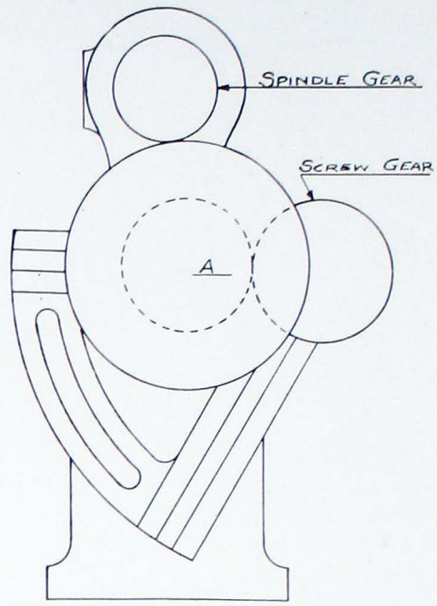

Fig. 29.

LEFT HAND THREADS
Compounded

Mesh large gear of Compound A with spindle gear. Mesh small gear of Compound A with screw gear.

Threads per in.	*Spindle Gear*	*Compound A*	*Screw Gear*
20	40	96–48	40
22	40	96–48	44
23	40	96–48	46
24	40	96–48	48
25	40	96–48	50
26	40	96–48	52
27	40	96–48	54
28	40	96–48	56
30	40	96–48	60
32	40	96–48	64
34	40	96–48	68
36	40	96–48	72
38	40	96–48	76
40	40	96–48	80
44	40	96–24	44
45	40	96–48	90
46	40	96–24	46
48	40	96–24	48
50	40	96–24	50
52	40	96–24	52
54	40	96–24	54
56	40	96–24	56
60	40	96–24	60
64	40	96–24	64
68	40	96–24	68
72	40	96–24	72
76	40	96–24	76
80	40	96–24	80
90	40	96–24	90

THREAD CUTTING GEAR TABLES—Continued

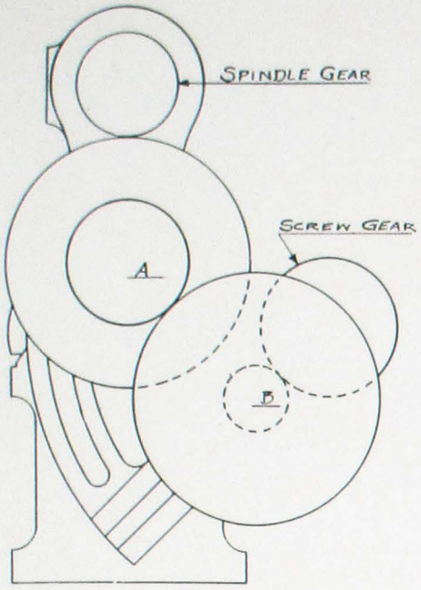

Fig. 30.

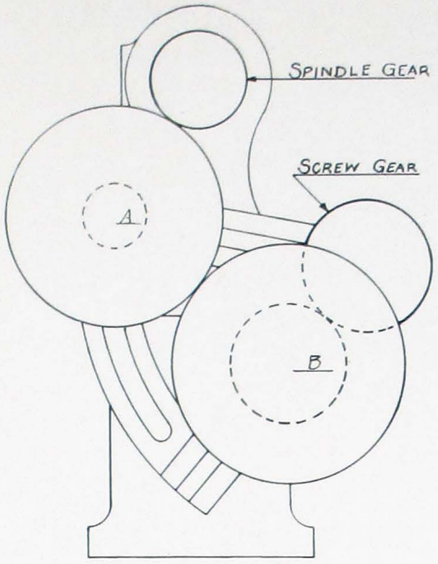

Fig. 31.

RIGHT HAND THREADS

Double Compounded

Mesh large gear of Compound A with spindle gear. Mesh small gear of Compound B with screw gear. Mesh small gear of Compound A with large gear of Compound B.

Threads per in.	*Spindle Gear*	*Compound A*	*Compound B*	*Screw Gear*
88	40	96–48	96–24	44
92	40	96–48	96–24	46
96	40	96–48	96–24	48
100	40	96–48	96–24	50
104	40	96–48	96–24	52
108	40	96–48	96–24	54
112	40	96–48	96–24	56
120	40	96–48	96–24	60

METRIC RIGHT HAND THREADS

Compounded

Mesh Idler A with large gear of Compound B. Mesh small gear of Compound B with screw gear. Use any small gear on stud with Idler A as a spacer.

Pitch mm.	*Spindle Gear*	*Idler A*	*Compound B*	*Screw Gear*
.25	40	86	96–24	80
.40	40	86	96–24	50
.50	40	86	96–24	40
.60	40	96	64–24	50
.70	40	86	96–42	50
.75	40	96	64–24	40
.80	40	86	96–48	50
.90	40	96	64–36	50
1.00	40	86	96–48	40
1.20	40	96	64–48	50
1.25	40	86	96–48	32
1.40	40	96	64–56	50
1.50	40	96	64–48	40
1.75	40	96	64–56	40
2.00	40	96	64–56	35

THREAD CUTTING GEAR TABLES —Continued

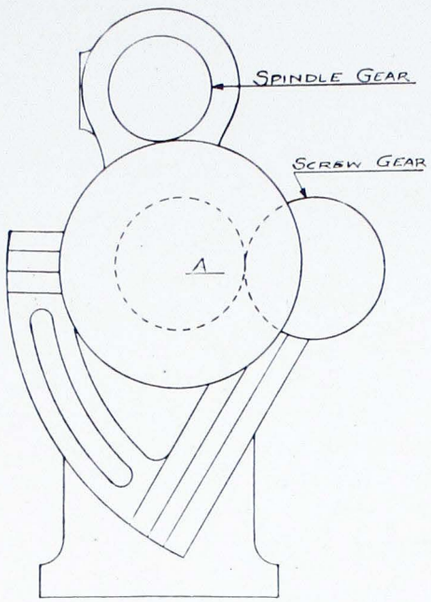

Fig. 32

METRIC LEFT HAND THREADS
Compounded

Mesh large gear of Compound A with spindle gear.
Mesh small gear of Compound A with screw gear.

Pitch mm.	*Spindle Gear*	*Compound A*	*Screw Gear*
.25	40	96–24	80
.40	40	96–24	50
.50	40	96–24	40
.60	40	96–36	50
.70	40	96–42	50
.75	40	96–36	40
.80	40	96–48	50
1.00	40	96–48	40
1.25	40	96–48	32

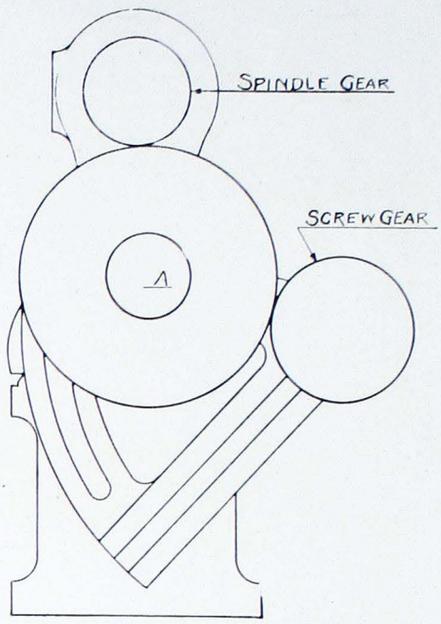

Fig. 33

METRIC LEFT HAND THREADS
Not Compounded

Mesh large Idler gear A with spindle and screw gears.
Use small gear on Idler Stud as spacer.

Pitch mm.	*Spindle Gear*	*Idler A*	*Screw Gear*
1.60	40	96	50
2.00	40	96	40
2.50	40	96	32

The formula for figuring change gears is—

$$N = \frac{S \times P}{L \times C}$$

where
N = number of teeth on screw gear.
S = number of teeth on spindle gear.
P = number of threads per inch to be cut.
L = number of threads per inch on lead screw.
C = ratio of compound gears.

On this thread cutting attachment—

S = 40
L = 10
C = 1, 2, 4 or 8

In arranging the gears the difference between a compound and an idler should be borne in mind. An idler is a single gear meshing with two other gears and its purpose is to reverse the direction of rotation of the final gear in the train or to make possible the meshing of the train with limited swing of the quadrant. Smaller gears are placed on the same studs as spacers but they do not necessarily rotate with the idler gears. Idlers do not effect the ratio of the train.

A compound is two gears of different numbers of teeth pinned together so that they both rotate as one. One gear of the compound meshes with one gear of the train; the other gear of the compound meshes with a *different* gear of the train. The purpose is to accomplish a considerable change in ratio. Compounds also reverse direction of rotation, making it necessary to use an idler in the train if rotation in the opposite direction is required.

UNIT BENCH

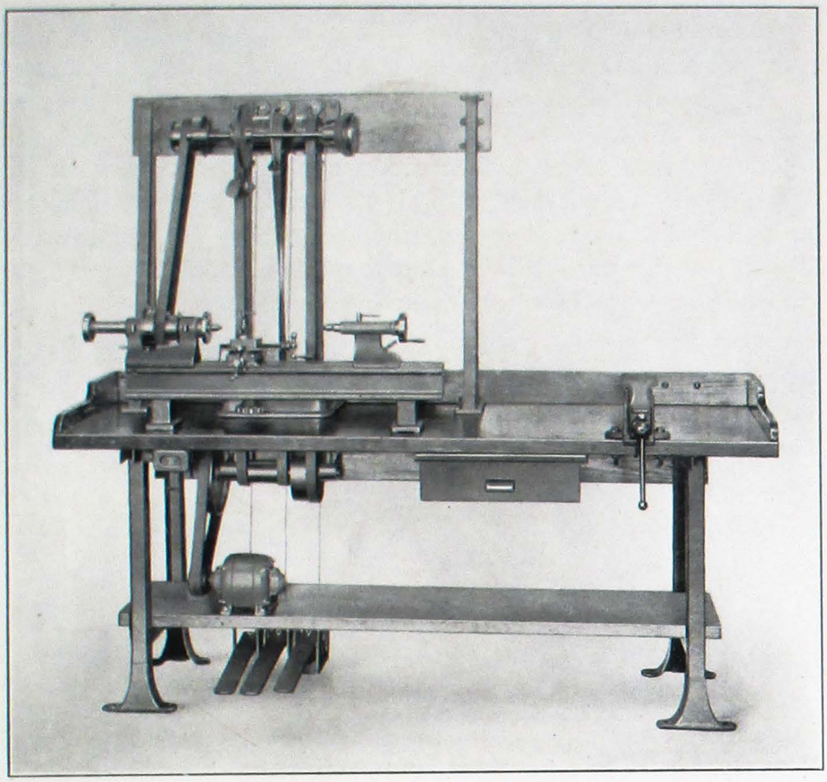

Fig. 34. Lathe on Unit Bench with Individual Motor Drive.

Fig. 34 shows a practical and convenient outfit for tool rooms, laboratories and repair shops. It is particularly desirable for the home or other isolated work room.

The outfit as illustrated consists of the following units: Bed, Headstock, Center and Center Chuck, Screw Draw-in-Spindle, Driving Plate, Tailstock, Compound Slide Rest, Countershaft, three Treadles, Grinding Countershaft, two Bench Legs, Bench Drawer, Belt Guard, two Countershaft Plank Supports, Motor Drive Jackshaft, Motor and Starter, Belts.

None of the wood work is supplied by us as this bulky material can be purchased locally at a saving. The bench top should be made of maple, chestnut, or hard pine following the layout and dimensions in Fig. 18 which shows a bench with ample room for the lathe and a bench vise. The bench may be made longer but the center distance of the legs should not exceed eight feet.

Fig. 35. Pressed Steel Bench Leg.

BENCH LEGS

We offer the "New Britain" Pressed Steel General Purpose Type G Bench Legs with straight bracket. They have been tried and tested under every condition of use and abuse and are found to fill every need.

Benches built with these legs are light, strong and without end sway. Wall support is unnecessary, permitting the bench to be placed in the center of the room or moved around as a unit.

Net Weight (each), 17 Lbs.

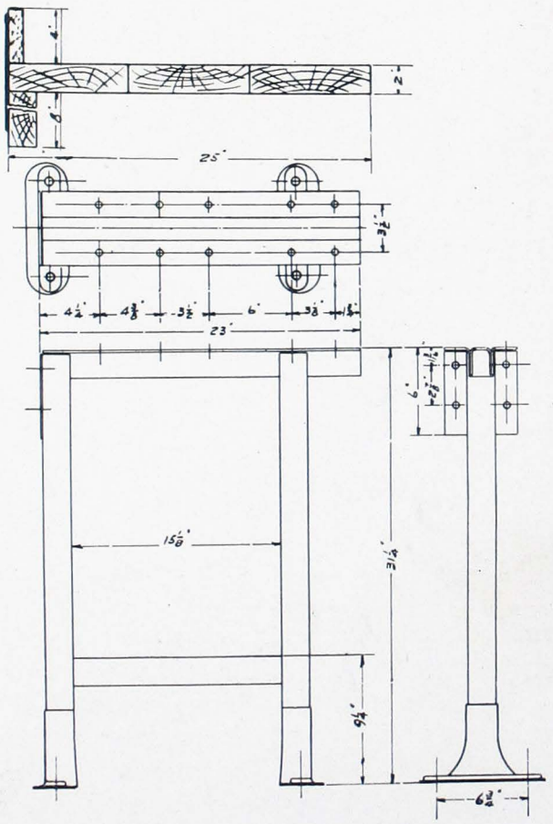

Fig. 36. Dimensions of Bench Leg.

BENCH DRAWER

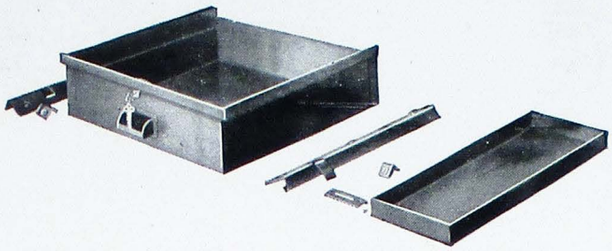

Fig. 37. Bench Drawer.

We offer the "New Britain" All Steel Bench Drawer with tray which will be found useful for storage of small tools, files, etc. A cylinder lock of good grade with two individual keys is provided. A hem of triple thickness around the upper edge and the welding of all joints produce a drawer of remarkable strength and durability. This drawer is sold as a unit and is easily installed without cutting the bench. To apply, simply remove the two stops and pull drawer completely out from slide-ways. After fastening ways to underside of bench with wood screws, insert drawer and replace stops.

SPECIFICATIONS

Inside dimensions . . . . . 18″ long, 16″ front to back, 5″ deep
Overall dimensions . . . . . 19″ " 16½″ " " " 5¾″ "

Net Weight, 17 Lbs.

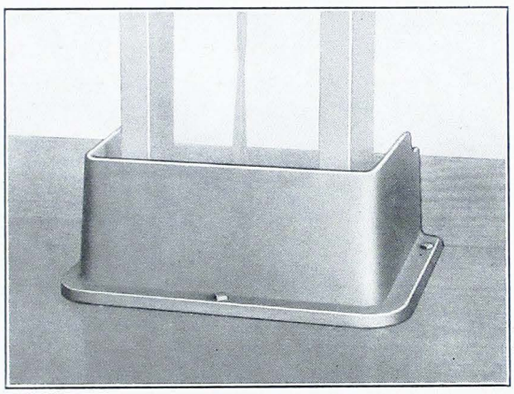

Fig. 38. Belt Guard.

BELT GUARD

This belt guard is a single casting, fastened to the bench top and surrounding the hole cut for the passage of the belts from jackshaft to countershaft. It prevents chips and tools placed on the bench from falling through the hole as well as adding to the general appearance of neatness.

Net Weight, 22 Lbs.

COUNTERSHAFT PLANK SUPPORT

The countershaft plank support is of cast iron 39½″ high. The foot is drilled for six lag screws for fastening to bench top. The upper portion is drilled for six lag screws to hold plank 1¾″ thick by 7½″ wide for supporting the lathe countershaft. Two or more of these supports are used in various combinations as illustrated by Figs. 15, 16, 18, 19, 21, 22 and 23.

Net Weight (each), 16 Lbs.

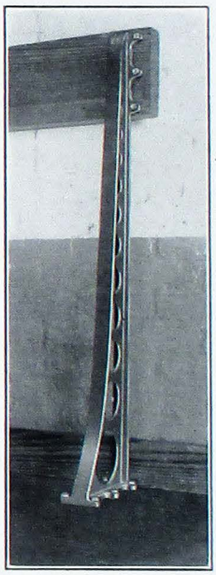

Fig. 39. Countershaft Plank Support.

MOTOR DRIVE JACKSHAFT

The use for the motor drive jackshaft is illustrated in Figs. 17, 18, 19 and 21. It is built from the same casting as the lathe countershaft and dimensions except of the pulleys may be taken from Fig. 7. The pulley to be driven by the motor is 10½″ diameter for belt 1½″ wide. The pulley for low speed and reverse is 3½″ diameter and the pulley for high speed is 7″ diameter. The shaft is 1″ diameter and runs in oilless wood bushings, requiring no attention.

Net Weight, 40 Lbs.

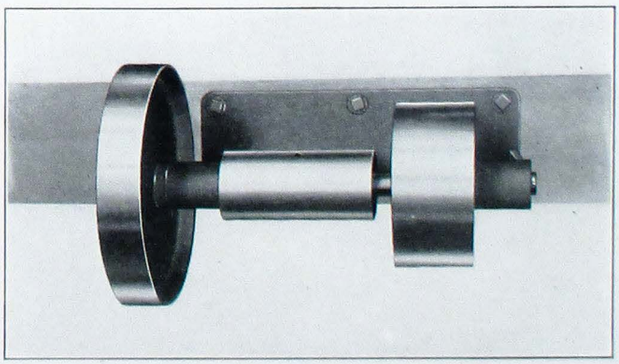

Fig. 40. Motor Drive Jackshaft.

MOTORS

A ½-horsepower motor is sufficient for driving the lathe mounted in any of the ways illustrated. It should run at 1700 to 1800 RPM and be equipped with standard pulley 3½" diameter for 1½" belt, suitable starting device, and preferably with sliding base or slide rails to take up the belt. Needless to say the electrical specifications should be suitable for the current available. We shall be glad to furnish proper motors to those who do not find it convenient to purchase locally.

BELTS

While we recommend that belting be purchased from a local mill supply house, we will as an accommodation furnish belting to those customers requesting it. Single oak-tanned leather belts will be satisfactory although some prefer more pliable belts tanned by other processes. Laps should be long and cemented where possible, as cemented belts run quieter than laced belts. For driving the grinding attachments a twisted rawhide belt is used. Widths and lengths of belts required for unit bench and cabinet mounting with liberal allowance for laps are as follows:—

Motor to motor drive jackshaft	1½" wide x 5′ long
Jackshaft to Lathe Countershaft (3)	1¼" " x 9′ "
Countershaft to Lathe	1¼" " x 6′ "
Lathe Countershaft to Grinding Countershaft	1" " x 3′ "
Grinding Countershaft to Grinding Attachments	¼" round x 6′ "

CABINET

The cabinet is highly recommended when an exceptionally neat and attractive unit is desired. It invariably becomes the "show piece" in mechanical, experimental and research laboratories, private work shops in homes or factories and in tool-rooms, when installed. Though particularly identified with the Rivett Senior Line, its utility justifies its presentation here.

The best practice of the cabinet making art and the use of oak and other hardwoods produce a cabinet of great sturdiness, and the high finish brings out the beauty of the natural wood. The top is built up of a number of laminations and will not crack or warp. The Rivett Cabinet is the finest product of its kind on the market.

The left hand compartment provides space for the motor and motor drive jackshaft, and the right hand compartment a place for storage of attachments. One drawer is equipped with a collet board. Good locks with keys are on the compartment doors and both drawers. Drawer pulls are cast brass.

Three hand belt shifter controls of special design are built into the cabinet and operate the belt shifters through wires provided. The motor switch may be mounted inside the motor compartment or on the left side of the cabinet.

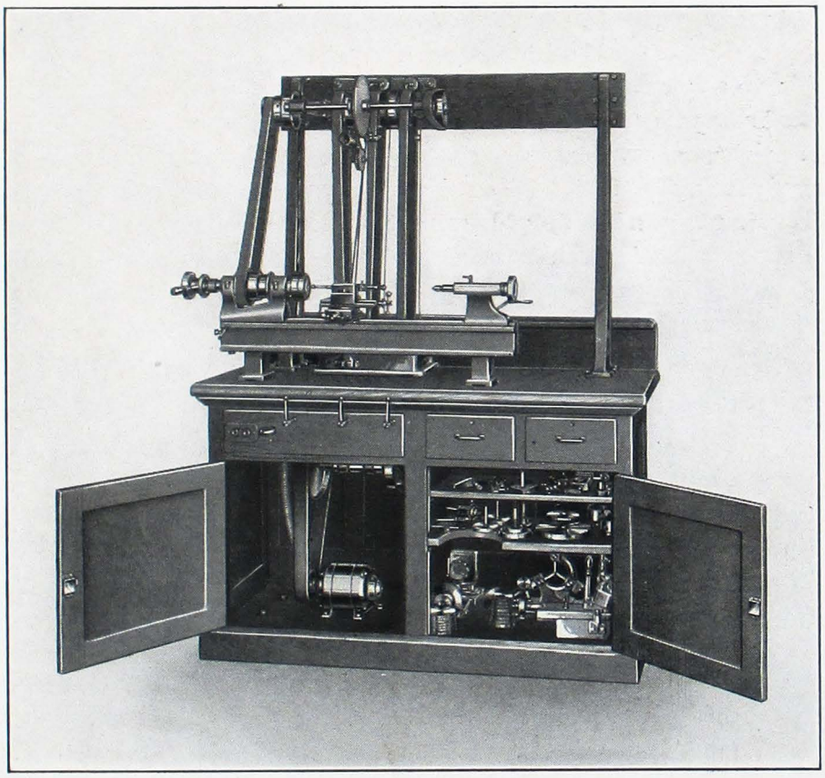

Fig. 41. Lathe on Oak Cabinet with Individual Motor Drive.

The outfit illustrated in Fig. 41 consists of the following units: Bed, Headstock, 3" Step Chuck, Step Chuck Closing Ring, Screw Draw-in-Spindle, Lever Chuck Closer, Tailstock, Compound Slide Rest, Clamping Bolt, Internal Grinding Attachment, Support for Grinding Attachment, Cabinet, Motor Drive Jackshaft, two Countershaft Plank Supports, Belt Guard, Lathe Countershaft, Grinding Countershaft, Motor, Belts.

CABINET—Continued

SPECIFICATIONS

Bench Top	24″ x 57″
Floor Space	23″ x 55″
Height, Floor to Bench Top	34″
Height, overall to top of Countershaft Mounting	6′ 1½″
Net Weight, Cabinet only	245 lbs.
Shipping Weight, Cabinet only	345 "
Shipping Weight, Cabinet with motor drive jackshaft	385 "
Shipping Weight, Countershaft Plank and two Countershaft Plank Supports	145 "

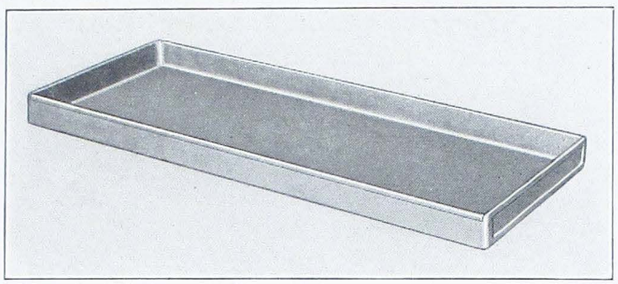

Fig. 42. Chip Pan.

CHIP PAN

The Chip Pan is made of sheet steel and is painted gray. It is 10″ wide, 24″ long and 1½″ deep. It is for use under the lathe to catch chips and oil and is an aid to cleanliness.

Net Weight, 2½ Lbs.

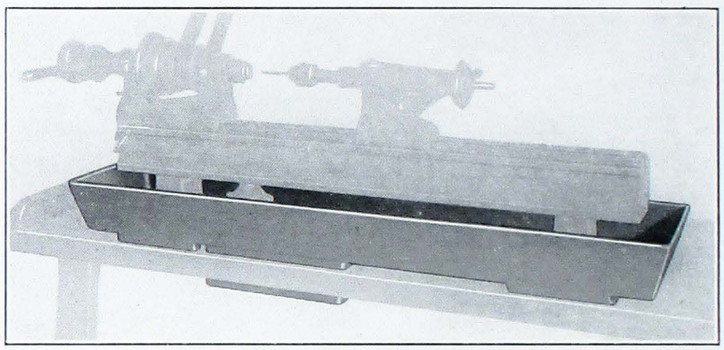

Fig. 43. Oil Pan.

OIL PAN

This is a cast iron pan 42½″ long, 11″ wide, 3¾″ deep, in which the whole lathe may be set. There are two pads inside the pan for the lathe legs to rest on, and pads on the bottom of the pan to serve as feet to rest on the bench. The bolts holding down the lathe pass through drilled holes in the pan and are tightened by nuts on the underside of the bench. By placing a few felt or leather washers between the pan and lathe legs, an oil tight joint is made. Cast in the pan is a deep depression which serves as an oil reservoir from which the oil may be drawn by removing a pipe plug. A strainer covers the top of the oil reservoir and as it is in the form of a basket, the accumulated chips may be removed readily. The use of this oil pan is highly recommended on installations where oil is used and where chips in quantity are likely to accumulate. This pan is particularly good under lathes used for manufacturing, as it keeps the bench and floor clean.

Net Weight, 86 Lbs.

Fig. 44. Oil Pan and Floor Legs.

FLOOR LEGS

The oil pan described above can be furnished with floor legs when it is desired to mount the lathe away from the wall. The legs are of cast iron and are bolted by cap screws to the pads on the bottom of the pan. The oil pan and floor legs are much used when the lathe is equipped as a hand turret lathe, although its use is not confined to this particular set up. As such it becomes a light manufacturing turret lathe which will produce small parts more rapidly than many heavier machines. As tool set-ups are quickly made, it is adapted especially for jobs where the quantity involved in a lot is too small to warrant the use of an automatic screw machine.

Net Weight (Oil Pan and Floor Legs), 200 Lbs.

FLOOR LEGS—Continued

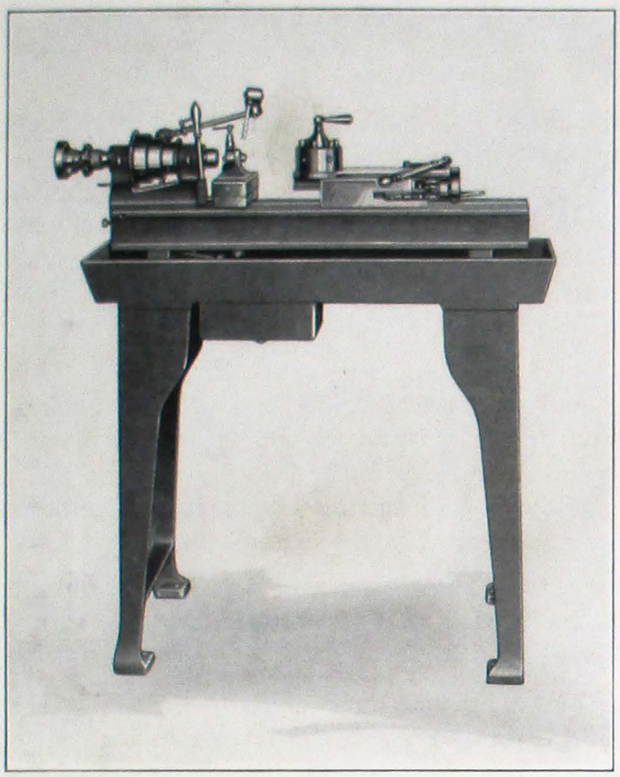

Fig. 45. Equipped as Hand Turret Lathe on Oil Pan and Floor Legs.

The outfit illustrated in Fig. 45 consists of the following units: (For dimension diagram see Fig. 20), Bed, Headstock, Screw Draw-in-Spindle, Lever Chuck Closer, Cutting off and Forming Slide, Turret Attachment-Automatic Indexing, Oil Pan, Floor Legs, Oil Pump and Piping.

FLOOR LEGS for oil pan and individual motor drive

When it is desired to drive the lathe mounted on oil pan and floor legs by individual motor, we furnish legs on which brackets are cast to carry the countershaft supports and motor drive jackshaft.

The Three Wooden Planks shown are not supplied by us as they can be purchased locally to better advantage. Any lathe combination can be mounted and driven in this way.

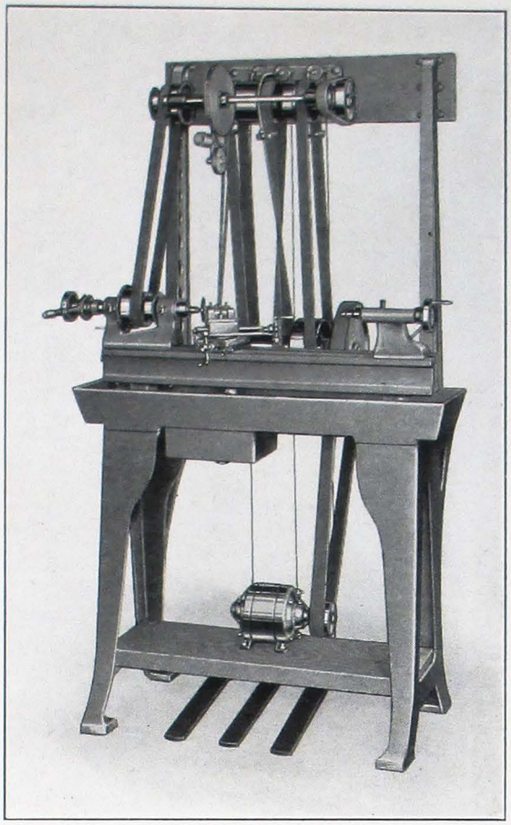

Fig. 46. Lathe on Oil Pan and Floor Legs with Individual Motor Drive.

Net Weight (Oil Pan and Motor Drive Floor Legs), 236 Lbs.

The outfit illustrated in Fig. 46 consists of the following units: (For dimension diagram, see Fig. 21) Bed, Headstock, Center and Center Chuck, Screw Draw-in-Spindle, Lever Chuck Closer, Tailstock, Compound Slide Rest, Clamping Bolt, Countershaft, three Treadles, Grinding Countershaft, External Grinding Attachment, Support for Grinding Attachment, Oil Pan, Floor Legs for Motor Drive, two Countershaft Supports, Motor Drive Jackshaft, Motor, Belts.

OIL PUMP AND PIPING

This attachment is offered in conjunction with the oil pan, where a copious flow of cutting oil is desired. It should be used particularly on the hand turret lathe and other manufacturing combinations. It consists of an adequate oil pump bolted to the back of the lathe bed, a countershaft pulley for driving the pump, intake piping with strainer, output piping with three swivel joints, shut off cock and nozzle.

Net Weight, 14 Lbs.

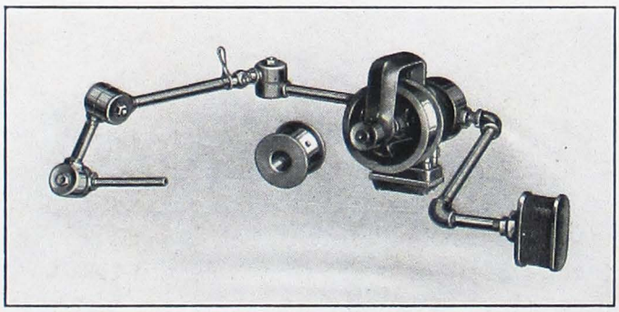

Fig. 47. Oil Pump and Piping.

COLLETS

The Rivett Junior Bench Lathe No. 507 accommodates the Rivett No. 7 Collet having a maximum capacity of ¾″ round, 17/32″ square and 21/32″ hexagon. These sizes of stock can be passed clear through the collet. The shank is 1″ diameter, angle 15° and threads 20 per inch. Length overall 3¼″.

Fig. 48. Rivett No. 7 Collet with Round-Hole.

Collets (draw-in-chucks or spring chucks as they are sometimes called) are very useful devices for holding bar stock and parts of small size while performing various machining operations. Their great advantage over other chucking means lies in their simplicity, convenience and power, coupled with the fact that they are self centering. For best results the hole size of the collet should closely approximate the diameter of the work to be held, yet it is possible to grip diameters .005″ over and .010″ under the nominal size of the collet hole.

Rivett collets are made of special tool steel, carefully machined to standard gauges, hardened at the large end and ground on the shank and angle. Round hole sizes are finished straight and true to size in the hole by grinding. The threads are blued. The length of bite is approximately twice the diameter of the hole, insuring a firm grip on the stock. Sizes are plainly marked.

Collets from 1/64″ hole diameter to ¾″ hole diameter by 64ths are regularly carried in stock. Special hole sizes such as odd decimal, drill and wire gauge, and metric sizes can be furnished as required.

Many thousands of Rivett Collets of various styles and sizes are sold each year, not only for Rivett Lathes but also for bench lathes, engine lathes, milling machines and grinding machines built by other machine tool makers. In fact, collet manufacture is one of our specialties and our collet departments are equipped with the most efficient machinery for volume production. A special collet booklet will be sent to those requesting it.

Rivett No. 7 collets in sets are offered at special prices which greatly benefit users of Rivett Junior Lathes.

COLLET BLANKS

Fig. 49. Collet Blank.

Collet blanks which have not been drilled, hardened or sawed are supplied to those who wish quickly to make up special collets to suit their work as it comes to them. The blanks are adaptable also to a variety of uses, such as mounting small face plates, special fixtures, etc.

Net Weight (each), ½ Lb.

TAPER HOLE COLLETS

Fig. 50. Taper Hole Collet.

Collets with taper holes are not split. The standard taper hole collet has a taper to correspond with the taper on the headstock and tail-stock center. One is required to hold the headstock center. Collets with taper holes of any size where the diameter at the large end does not exceed ¾″ will be furnished on special order.

Net Weight (each), ½ Lb.

COLLETS — Continued

SQUARE HOLE COLLETS

Fig. 51.
Square Hole Collet.

Collets with square holes are not carried in stock but are made up on special order in any size up to 17/32". Square hole collets are hardened.

Net Weight, 3/8 Lb.

HEXAGON HOLE COLLETS

Fig. 52.
Hexagon Hole Collet.

Collets with hexagonal holes are not carried in stock but are made up on special order in any size up to 21/32" across flats. Hexagon hole collets are hardened.

Net Weight, 3/8 Lb.

STEP COLLETS

Fig. 53. Step Collet.

Step collets are used for holding short lengths of bar stock and various partially machined pieces where the diameter is greater than the capacity of a standard collet or where a back shoulder is required to act as a locating point for the part held. It is apparent that the nominal hole does not pass clear through the collet. Step collets are not carried in stock but are made up on special order in any hole size up to 1 1/4" diameter and any depth of hole up to 1/2". If steps over 1 1/4" diameter are desired, step chucks should be ordered. Step collets are hardened and ground in the hole.

Net Weight, 3/8 Lb.

STEP CHUCKS

Step Chucks are self centering and are used for holding short pieces of bar stock, thin discs such as gears and wheels, tubing and various parts which require a grip along a comparatively short length. They can be furnished in 2", 3" and 4" nominal sizes either blank or with steps cut, the face being large enough for a step of the nominal size. One step of a given diameter not over 3/8" deep or several steps of different diameters where the sum of the depths of the steps does not exceed 3/8" may be cut as required. Blank step chucks are offered for those who wish to cut the steps as needed. This is easily done in the lathe by means of the slide rest, and the operation can be performed a number of times, as occasion requires.

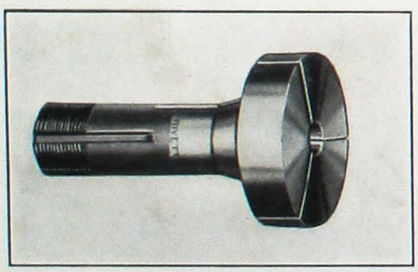

Fig. 54. Two-inch Step Chuck Blank

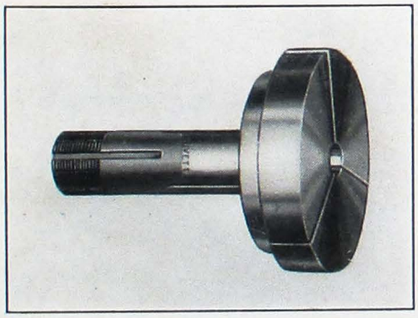

Fig. 55. Three-inch Step Chuck Blank.

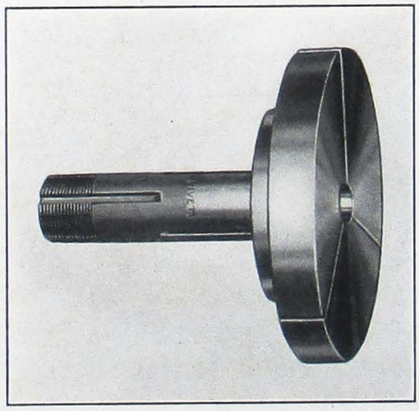

Fig. 56. Four-inch Step Chuck Blank.

—[*page twenty-seven*]—

STEP CHUCKS—Continued

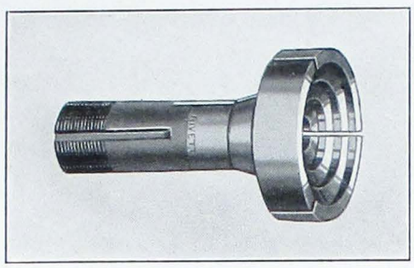

Fig. 57. Two-inch Step Chuck-Stepped.

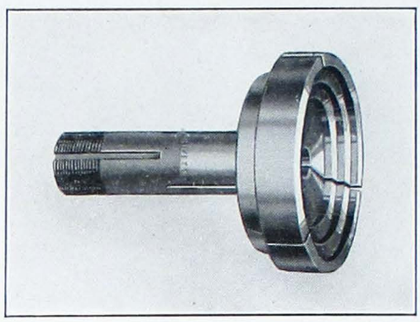

Fig. 58. Three-inch Step Chuck-Stepped.

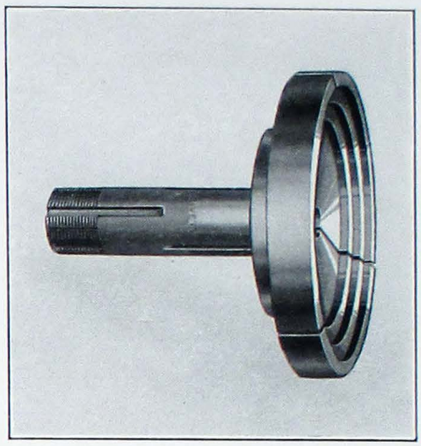

Fig. 59. Four-inch Step Chuck-Stepped.

The step chuck is made from a solid piece of steel, not hardened, and both blank and recessed chucks are sawed and have a ½″ hole drilled clear through. The shanks fit the headstock and draw-in-spindles. The 2″ size is closed by the internal taper of the headstock spindle, but the 3″ and 4″ require a step chuck closing ring. (Fig. 60).

Net Weight, 2″, 1 Lb. 3″, 2¼ Lbs. 4″, 2¾ Lbs.

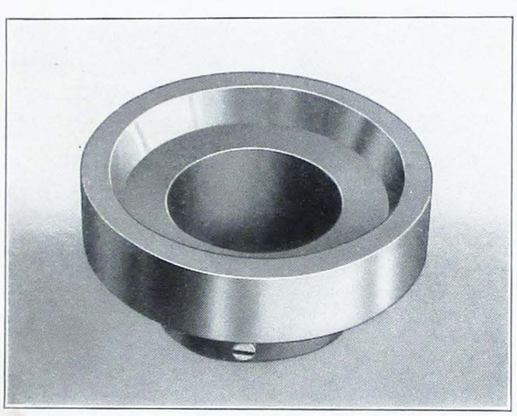

Fig. 60. Step Chuck Closing Ring.

STEP CHUCK CLOSING RING

The step chuck closing ring is necessary for closing 3″ and 4″ step chucks. It is made of cast iron and fits on the taper nose of the headstock spindle. A tapered recess matches the male taper on the step chuck, causing the chuck to be closed as it is drawn into the ring, either by the screw draw-in-spindle or by the lever chuck closer. The large diameter of the ring gives powerful gripping action. The same closer fits both the 3″ and 4″ step chucks and only one need be included in the equipment of a lathe.

Net Weight, 1½ Lbs.

SCREW DRAW-IN-SPINDLE

The screw draw-in-spindle consists of a cast iron hand wheel fastened to a tube entering the headstock spindle from the rear, threaded on its inner end to engage collets, center chucks and step chucks. By turning it, collets and step chucks are closed and opened. It also becomes a component part of the lever chuck closer. The hand-wheel has four drilled holes on its periphery into which a pin may be inserted to obtain greater leverage. A lathe is not complete without a draw-in-spindle, it being required to hold the center chuck.

Net Weight, 3 Lbs.

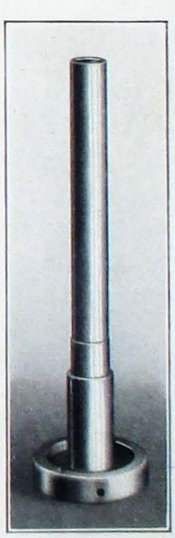

Fig. 61. Screw Draw-in-Spindle.

LEVER CHUCK CLOSER

The lever chuck closer, while of distinct advantage on every lathe, is particularly recommended where many parts of the same size are to be chucked in collets or step chucks. It opens and closes the collets or step chucks by the simple movement of a lever instead of by turning the draw-in-spindle. Besides being faster, its use gives positive and uniform tension, and reduces very materially the wear on collet and draw-in-spindle threads.

It consists of a bracket bolting to a pad on the rear of the headstock; a lever swivelling in this bracket and carrying two pins engaging a groove in a hardened steel cone sleeve which is free to slide longitudinally on the draw-in-spindle; a circular plate, fitting the recess in the draw-in-spindle knob, carrying two hardened bell-crank fingers;

LEVER CHUCK CLOSER — Continued

and a hardened steel sleeve for the draw-in-spindle, one end of which is in contact with the short levers of the bell-cranks, and the other end of which makes firm contact with the headstock spindle. The action of the lever chuck closer is this: When the lever is moved to the left, the cone sleeve is moved longitudinally to the left, the cone forcing apart the long arms of the bell-crank fingers. The short arms move and bring pressure against the draw-in-spindle sleeve, but as this sleeve is restrained by its contact with the headstock spindle, pressure is exerted by the finger plate on the draw-in-spindle knob, causing the draw-in-spindle to move slightly but powerfully to the left, pulling with it the collet or step chuck, which, being drawn into a taper, is closed. Moving the lever to the right releases the pressure and the collet opens. The desired amount of tension is obtained by turning the draw-in-spindle knob, and after this first adjustment, the finger plate is locked to the draw-in-spindle knob by tightening two slotted screws. It will be noted that the regular draw-in-spindle is used with the lever chuck closer, a decided advantage over all other lever closers, which require a special spindle, with consequent increase in the cost of the attachment.

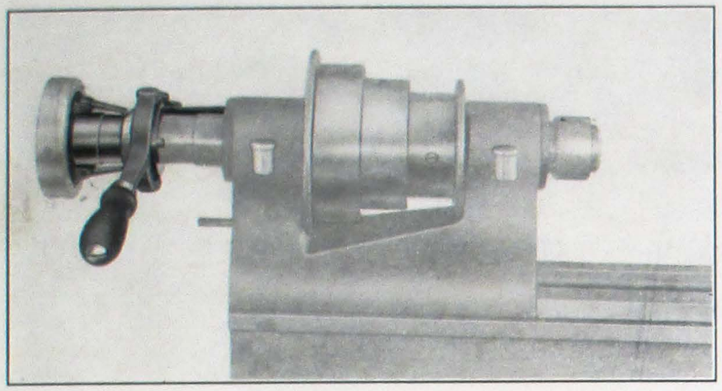

Fig. 62. Lever Chuck Closer.

The lever chuck closer is simple, powerful and can be installed in a moment's time without fitting or machining. It interferes in no way with any other attachment and its use is strongly recommended.

Net Weight, 2½ Lbs.

JAW CHUCKS

The Jaw Chucks we furnish are of two types. The 4″ chuck is of the universal geared scroll type in which the three jaws move in unison. This type is for concentrically chucking cylindrical pieces. Two sets of jaws are furnished, one set for gripping on the outside of work, the other for gripping in a hole. The 4″ chuck will hold work up to 4¼″ diameter.

The 6″ chuck is of the independent type in which the four jaws are moved separately and is used for holding odd shaped pieces and round parts where the self centering feature of the universal chuck is not desired. The 6″ chuck will hold work up to 7¼″ diameter. The jaws are reversible for outside and inside work.

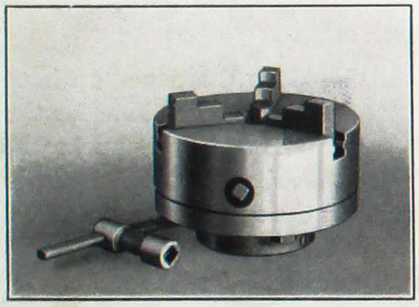

Fig. 63. Four-inch—three-Jaw Geared Scroll Chuck.

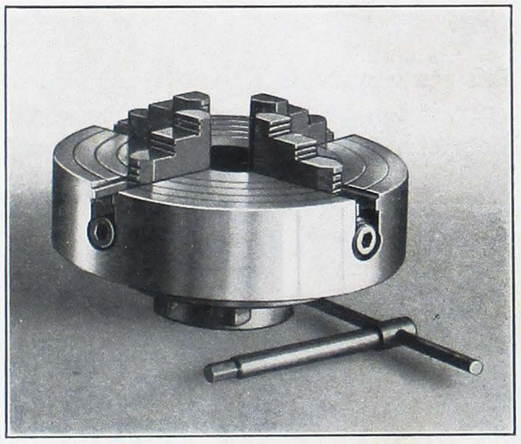

Fig. 64. Six-inch—four-Jaw Independent Chuck.

These jaw chucks have hollow backs, making them lighter and better adapted for a bench lathe than the heavier solid body chucks; yet, they are amply strong and durable. Each chuck is mounted on a plate fitting the headstock spindle nose and having the two screw locking device described with Fig. 2. It is impossible for the chuck to come off the headstock spindle nose no matter whether the lathe is run backward or forward, a feature not to be had on a lathe with threaded spindle nose. A T wrench for moving the jaws is supplied with each chuck.

Net Weight, 4″ Chuck, 6¼ Lbs. 6″ Chuck, 11 Lbs.

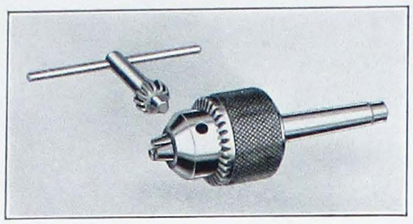

Fig. 65. Drill Chuck on Taper Shank.

DRILL CHUCKS

We can supply drill chucks in three sizes of the following capacities: 0 to $\frac{3}{64}$", 0 to $\frac{1}{64}$", 0 to $\frac{7}{32}$". Each chuck is mounted on a taper arbor or shank fitting the tailstock spindle and headstock center chuck. These drill chucks are a standard make of improved type, with hardened jaws and will hold drills, taps, reamers, counterbores, etc., firmly and accurately.

Net Weight, 0-$\frac{3}{64}$", ½ Lb. 0-$\frac{1}{64}$", 1⅛ Lbs. 0-$\frac{7}{32}$", 2½ Lbs.

SUPPORT FOR GRINDING ATTACHMENTS

The exceedingly low cost of the Internal and External Grinding Attachments is arrived at by so designing them that the same support is used for both, therefore, the support is here presented as a separate unit. If one of the grinding attachments is ordered, the support must be ordered with it, but if both attachments are ordered, one support only is necessary.

The support is a small cast iron bracket, planed and scraped to rest squarely on the top slide of the compound slide rest, with a tongue for alignment which will fit either slot in the slide rest. A T bolt and eccentric shaft clamps the support rigidly to the slide. The grinding attachments slip on to the round shaft, which is a part of the support. Thus, the parts which are common to both grinding attachments are included in the support unit.

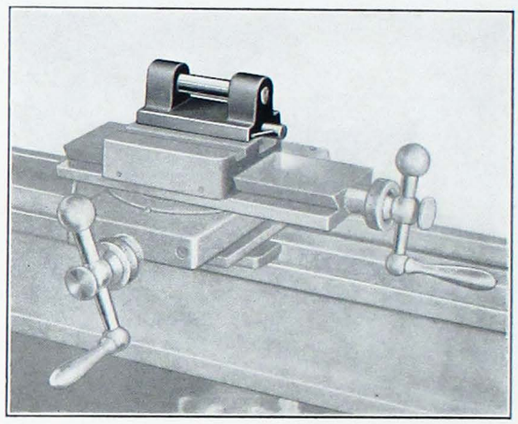

Fig. 66. Support for Grinding Attachments.

To change grinding attachments, it is necessary only to loosen the set screw holding the grinding attachment on the support shaft, and withdraw the shaft. The other grinding attachment may then be mounted in its place.

It will be seen that the grinding attachments will rock on the support shaft. This motion is restrained by two set screws which are also used for adjustment to bring the grinding attachment on the lathe center line.

Net Weight, 1 Lb.

INTERNAL GRINDING ATTACHMENT

This attachment has a wider use than its name implies. While primarily for grinding holes, either straight or taper, it can be used also for external grinding, surface grinding, sharpening cutters, reamers, end mills, counterbores, etc., lapping, drilling at high speed with small drills, and for milling with small mills.

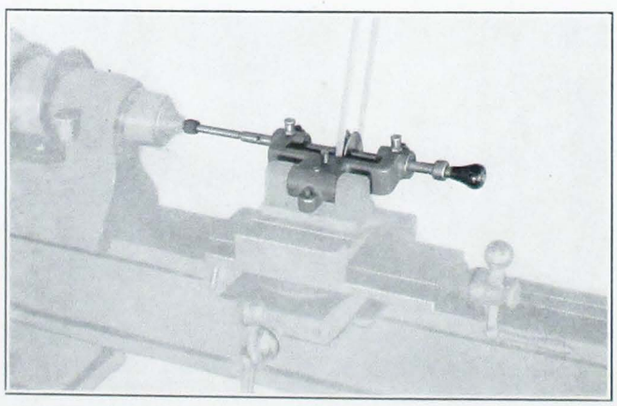

Fig. 67. Internal Grinding Attachment.

The spindle is ⅜" diameter and 7¾" long, hardened on both ends. The wheel end has a No. 4 P & W Taper hole for the insertion of wheel mounts, wheel arbors and drill chucks. A cross hole is provided for drifting the arbors with the drift pin furnished with the attachment. On the opposite end is a hard rubber handle to grasp when traversing the spindle. As this handle is free on the spindle, it can be held without burning the fingers.

The spindle is driven from the grinding countershaft by a grooved pulley, having a pitch diameter of 1¼". Four speeds may be attained, two from the lathe countershaft and two by reversing the pulleys driving the countershaft attachment. When the countershaft is driven at the normal suggested speeds, the speeds of the grinding attachment are 1100, 2580, 3000, and 7100 R.P.M. The length of traverse of the spindle is 2", which may be shortened to the desired length by an adjustable stop collar.

INTERNAL GRINDING ATTACHMENT—Continued

The two hard bronze bearings have straight holes and are split so that they may be adjusted by screws which compress the split housings. Oil cups assure sufficient supply of lubricant.

The bracket carrying the spindle and bearings mounts on the support for grinding attachments as shown in Fig. 66, and provides adjustment for raising or lowering the grinding wheel to bring it in the desired relation with the work. Cross, longitudinal and angular feeds are accomplished by the feed screws of the slide rest on which the attachment is mounted. The adjustable stop on the cross slide of the slide rest will be found useful to limit the feed on duplicate work.

Two wheel arbors are furnished, one each No. 1 and No. 2. The No. 1 is suitable for a wheel not over 2″ diameter 3/16″ wide, and the No. 2 for small wheels not over 3/8″ diameter. Other standard arbors are listed below.

The grinding countershaft, Fig. 9, is necessary for driving the grinding attachments.

Net Weight, 1½ Lbs.

GRINDING WHEEL ARBORS

Two grinding wheel arbors, one each of sizes No. 1 and No. 2, are furnished as part of the equipment of the internal grinding attachment. No. 1 is to be used for carrying the larger sizes of grinding wheels, such as are required for surface and face grinding. No. 2 is used for smaller wheels for internal grinding. In hole grinding, the arbor should be somewhat smaller in diameter than the hole to be ground, but best results are obtained when the arbor is as large as possible and as short as will reach the back of the hole to be ground. To cover a good range of holes, we stock the various sizes of arbors listed in the accompanying table.

The arbors are made of steel and are accurately ground and with each arbor is furnished a wheel retaining screw. The tapered portion fits the tapered hole in the end of the grinding attachment spindle.

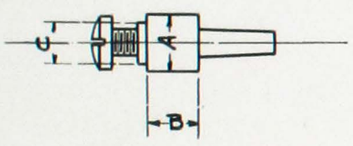

Fig. 68. Style A.

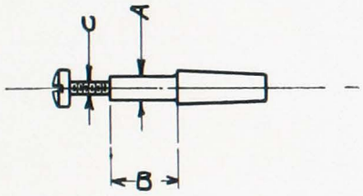

Fig. 69. Style B.

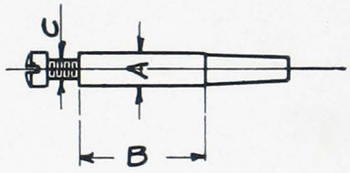

Fig. 70. Style C.

STANDARD GRINDING WHEEL ARBORS

Arbor No.	Style	Taper	A	B	C	Retaining Screw	Wheel Sizes		Hole
							Diameter	Width	
1	A	No. 4 P.W.	½″	7/16″	3/8″	10-30 L.H.	over ½″ to 2″	1/8″ to 3/16″	3/8″
2	B	No. 4 P.W.	1/8″	½″	1/16″	1/16″-60 L.H.	over 1/8″ to 3/8″	1/8″ to ¼″	1/16″
3	B	No. 4 P.W.	3/16″	5/8″	1/16″	1/16″-60 L.H.	over 3/16″ to 3/8″	1/8″ to ¼″	1/16″
4	C	No. 4 P.W.	¼″	¾″	1/8″	1/8″-40 L.H.	over ¼″ to 5/8″	1/8″ to ¼″	1/8″
5	C	No. 4 P.W.	¼″	1″	1/8″	1/8″-40 L.H.	over ¼″ to 5/8″	1/8″ to ¼″	1/8″
6	C	No. 4 P.W.	¼″	1½″	1/8″	1/8″-40 L.H.	over ¼″ to 5/8″	1/8″ to ¼″	1/8″

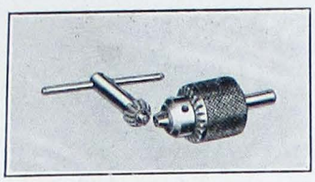

Fig. 71. Drill Chuck on Shank to fit Internal Grinding Attachment.

DRILL CHUCK for Grinding Attachment

As the internal grinding attachment is convenient for drilling and milling as well as for grinding, a chuck to hold small drills, mills and wheel arbors is a necessity. The drill chuck illustrated is a standard Jacobs No. 0, capacity 0 to 1/8", mounted on a shank to fit the tapered hole in the internal grinding attachment spindle. A chuck wrench is included.

Net Weight, 1/8 Lbs.

EXTERNAL GRINDING ATTACHMENT

This attachment is for external or cylindrical, face and surface grinding and is particularly useful for grinding the lathe centers. It differs from the internal grinding attachment in that the spindle itself is not traversed, longitudinal or angular feed being accomplished by the upper slide rest screw, and cross feed by the lower slide rest screw. The support as shown in Fig. 66 is the means of mounting this attachment on the top slide of the slide rest, the one support serving for both this and the internal grinding attachment. Two adjusting screws in the grinding attachment bracket provide means for raising or lowering the grinding wheel in relation to the center line of the lathe, as the nature of the work requires.

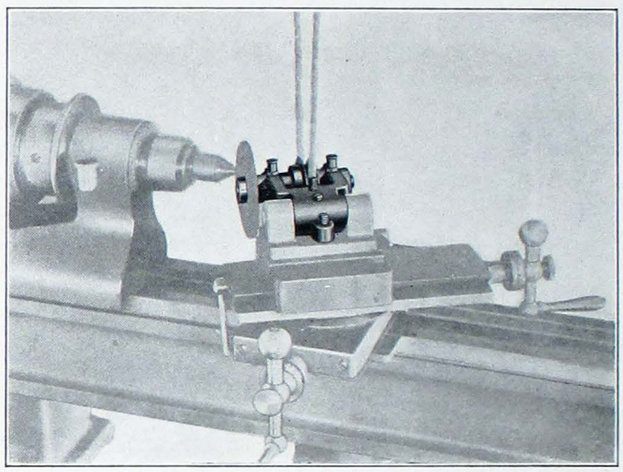

Fig. 72. External Grinding Attachment.

The spindle, 3/8" in diameter, runs in two hard bronze bearings, having straight holes, split so that they may be adjusted by screws compressing the housings. Oil cups supply lubricant to each bearing. End thrust is taken by two fibre washers placed between the sides of the pulley and the bearing housings, a threaded nut on the pulley providing the necessary adjustment. The pitch diameter of the pulley is 1 7/8" and four speeds of 740, 1650, 2000 and 4750 R.P.M. are obtainable when the countershaft is driven at the normal suggested rates. The grinding wheel is mounted directly on the spindle and is held by a collar flange and screw. Wheels of 3/8" diameter hole size, width up to 1/8", and diameter up to 3" can be accommodated.

The grinding countershaft, Fig. 9, is necessary for driving the grinding attachments.

Net Weight, 1 1/4 Lbs.

MILLING ATTACHMENT

The milling attachment will be found most useful in the tool-room, experimental shop, laboratory and for light production, as with it gears, pinions, milling cutters, end mills, reamers, counterbores and taps can be milled accurately and conveniently. Profiling, flat milling and keyseating can be done on work held in a collet or vise or strapped to the angle iron or top slide of slide rest. Having three slides which may be moved in as many planes and four swivels which may be set at any angle, there is hardly a combination of motions that cannot readily be obtained. To state the capacity of the attachment in figures is difficult as the variety and range of work that can be milled is so great. Suffice it to say that any job that one can rightfully expect to mill on a bench lathe can be handled, from the very smallest up to—in some cases—2 1/2" or 3" in diameter.

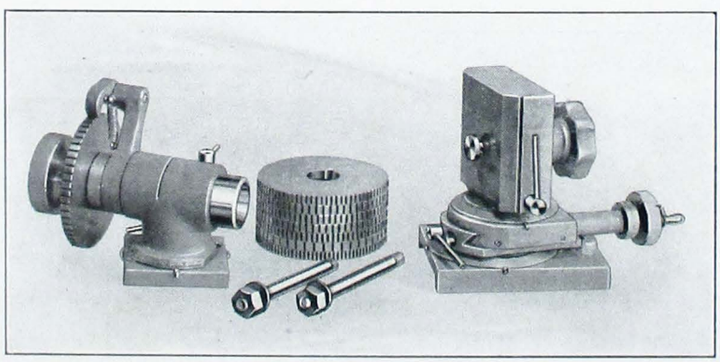

Fig. 73. Milling Attachment.

Work can be held in the indexing work spindle and holder, strapped directly to the top slide of the slide rest, held in the vise mounted on the angle iron or directly on the top slide of slide rest or strapped directly on the angle iron. The vise and angle iron are useful adjuncts described fully as separate units.

MILLING ATTACHMENT—Continued

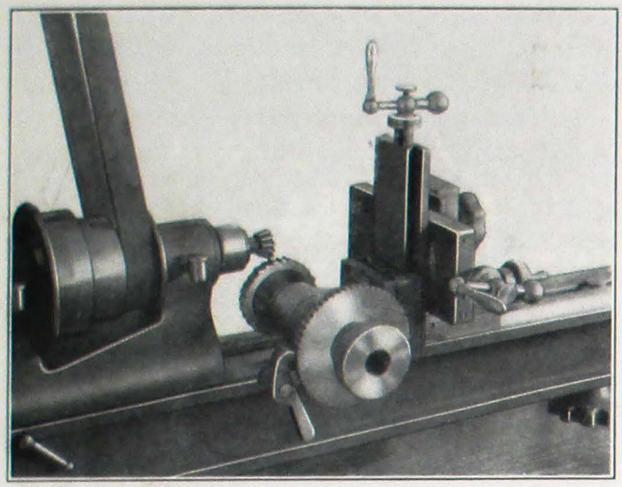

Fig. 74. Head end view of Milling Attachment set to mill teeth in a Milling Cutter.

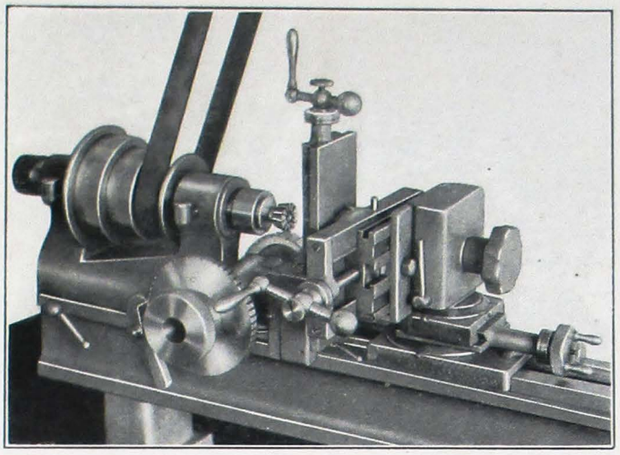

Fig. 75. Tail end view of Milling Attachment set to mill teeth in a Milling Cutter.

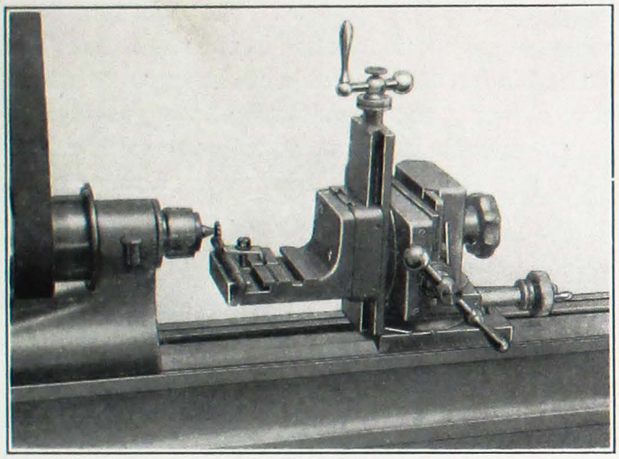

Fig. 76. Milling Attachment with Angle Iron set as plain miller to mill keyway in shaft.

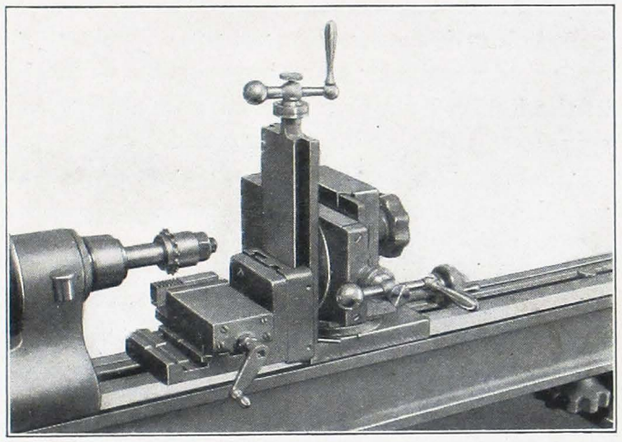

Fig. 77. Milling Attachment with Angle Iron and Vise set as plain miller for milling teeth in rack.

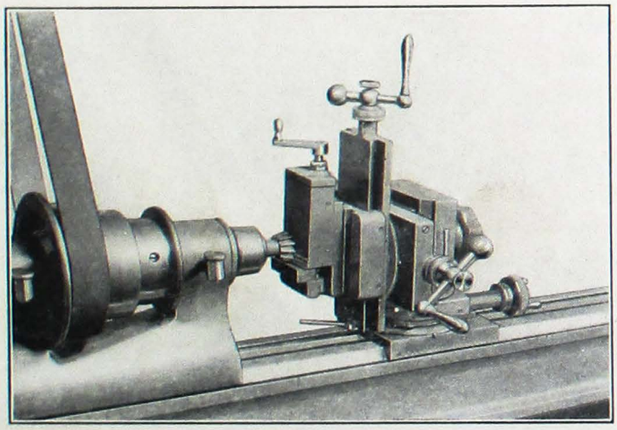

Fig. 78. Milling Attachment with Vise set as plain miller for milling dovetail.

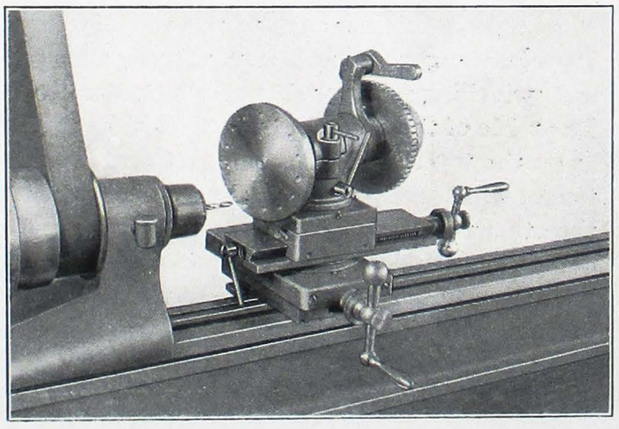

Fig. 79. Milling Attachment Index Head on compound slide rest, drilling equally spaced holes at an angle.

MILLING ATTACHMENT—Continued

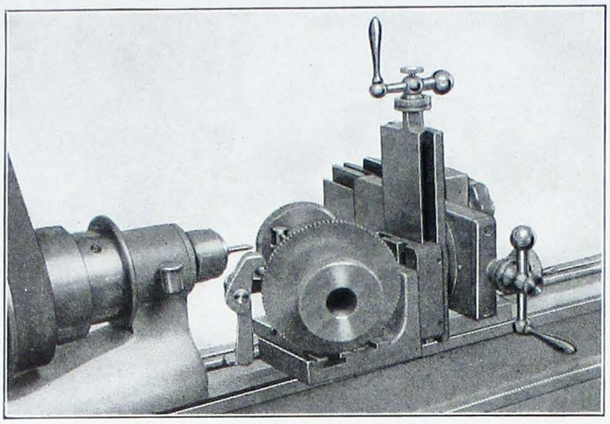

Fig. 80. Milling Attachment Index Head on Angle Iron and Milling Attachment Graduating Bevel Dial.

The working cutter is held in and driven by the lathe headstock, either in collets in the cases of straight or tapered shank end mills, keyway cutters, counterbores, etc., or by arbors held in collets in the cases of saws, gear cutters and milling cutters having holes. Thus, a range of cutter speeds equal to the headstock spindle speeds can be obtained without extra belting.

The milling attachment consists of a shoe scraped to fit the top of the lathe bed, fastened firmly thereto by two studs, nuts and washers in any desired location on the bed. On top of the shoe is a swivel which may be set at any angle within the full 360° and locked in position by an eccentric binder. This swivel carries a slide having a travel of 1⅛″ in the direction of the swivel actuated by a feed screw having a large adjustable dial graduated in thousandths, the same as on the slide rest. On this slide is a support for the regular compound slide rest swiveling independently to any angle through the full 360° and locking in position by an eccentric binder. The slide rest is fastened to the support by a T bolt tightened by a handwheel and is positioned through a wide range by the adjustable guide plate on the base of the slide rest. The second feed motion is by the lower slide rest screw and provides a cross feed of 4⅞″. The third swivel is the swivel on the slide rest carrying the top slide having a travel of 5″ actuated by the upper slide rest screw. This slide is usually used for vertical feed or an angular feed having a vertical component. The work spindle or quill holder is mounted on the top slide and fastened by two T washers engaging the T slots in the top slide. The quill holder swivels to any angle and is locked in place by an eccentric binder. The work-carrying spindle is held in the holder by a clamp screw and consists of a non-rotating sleeve carrying the indexing pawl and a revolvable spindle carrying an index plate and draw-in-spindle. The mouth of the spindle is ground to take the same collets as the headstock. Eight index plates with divisions of 45-56-60-64-72-80-84-100 are included giving a range of all the dividing numbers usually needed.

The eccentric binders and T bolts are very powerful and the various slides can be firmly locked, making the attachment remarkably rigid. The swivel dials are all cut on bevels so that they are easily read and are graduated in degrees with "lubber" lines permitting readings of full 360°. The dials on the feed screws are of large size graduated in thousandths of an inch and movable so that they may be set at zero or any other desired reading.

Net Weight, 29 Lbs.

ANGLE IRON

The angle iron is fastened to the top slide of the slide rest by two T washers engaging the T slots therein, thus providing an horizontal and swivelling milling table on which work can be held by straps. The table of the angle has two T slots of the same size and spacing as on the top slide of the slide rest and in addition three V grooves two of which are parallel to the slots and the third at right angles to the other two, in which cylindrical work can be clamped. The indexing head and vise also can be held on the table of the angle iron, adding materially to the range of the milling attachment and to the usefulness of the angle iron. The angle iron finds use also when mounted on the slide rest apart from the milling attachment.

Net Weight, 3½ Lbs.

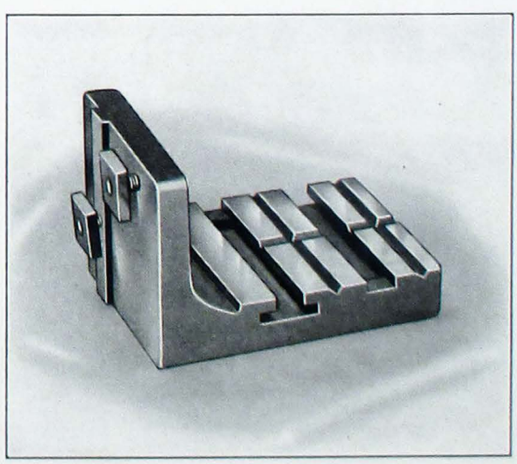

Fig. 81. Angle Iron for Milling Attachment.

VISE

The vise is a handy and powerful little device for holding work during turning, milling, drilling and grinding operations. Its tongued base fits the T slot of the top slide of the slide rest, slotted face plate and angle iron, making its application universal. It is held in the various situations by a T bolt.

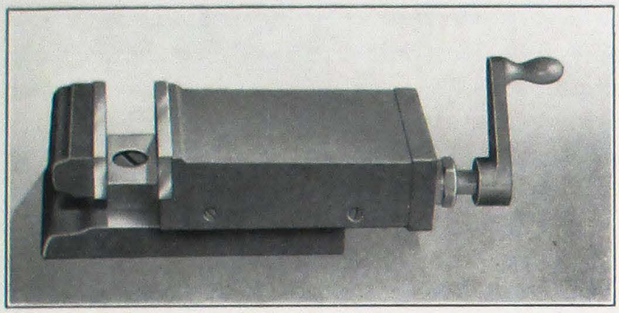

Fig. 82. Vise.

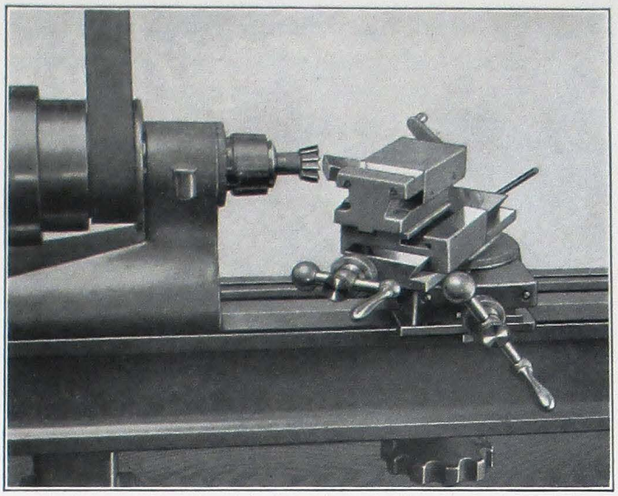

Fig. 83. Vise on Slide Rest, milling bevel on rectangular stock.

The jaws are of hardened steel, ground and removable, $1\frac{3}{32}$″ wide, opening $1\frac{3}{4}$″ and $\frac{9}{16}$″ deep. The movable jaw is dovetailed and gibbed, with feed screw and bronze nut.

Net Weight, 3 Lbs.

ARBORS

These arbors are useful for holding work by the hole either in the headstock spindle or milling attachment spindle, and being centered on both ends, may be used between the lathe centers. They are also used for holding milling cutters, saws, etc., in the lathe headstock while milling. They are made of steel in sizes on the holding diameter from $\frac{3}{16}$″ to $\frac{5}{8}$″ advancing by 16ths, and in sizes $\frac{3}{4}$″, $\frac{7}{8}$″ and 1″. Other sizes can be made by the lathe owner as required. The holding diameter is ground and has a spacing collar tightened by a hexagonal nut, all so proportioned that cutters from $\frac{1}{32}$″ wide to maximum capacity are rigidly held. The other end is ground to a convenient size for holding in round hole collets. The important dimensions are shown in the following table.

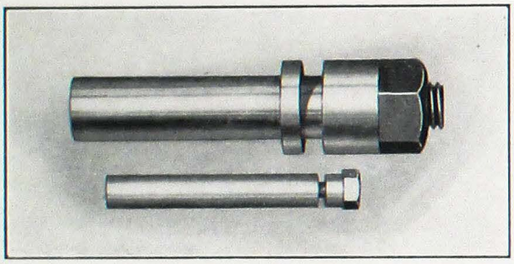

Fig. 84. Arbors.

Net Weight (Average), $\frac{3}{8}$ Lb.

DIMENSIONS OF ARBORS

Nominal Diameter	Holding Width Min.	Holding Width Max.	Shank Diameter	Length Over all
$\frac{3}{16}$″	0	$\frac{1}{8}$″	$\frac{3}{8}$″	$2\frac{7}{8}$″
$\frac{1}{4}$″	0	$\frac{3}{16}$″	$\frac{1}{2}$″	$2\frac{7}{8}$″
$\frac{5}{16}$″	0	$\frac{1}{4}$″	$\frac{9}{16}$″	$3\frac{1}{4}$″
$\frac{3}{8}$″	$\frac{1}{32}$″	$\frac{5}{16}$″	$\frac{5}{8}$″	$3\frac{3}{8}$″
$\frac{7}{16}$″	$\frac{1}{32}$″	$\frac{3}{8}$″	$\frac{5}{8}$″	$3\frac{1}{2}$″
$\frac{1}{2}$″	$\frac{1}{32}$″	$\frac{7}{16}$″	$\frac{3}{4}$″	$3\frac{5}{8}$″
$\frac{9}{16}$″	$\frac{1}{32}$″	$\frac{1}{2}$″	$\frac{3}{4}$″	$3\frac{7}{8}$″
$\frac{5}{8}$″	$\frac{1}{32}$″	$\frac{9}{16}$″	$\frac{3}{4}$″	4″
$\frac{3}{4}$″	$\frac{1}{32}$″	$\frac{5}{8}$″	$\frac{3}{4}$″	$4\frac{1}{4}$″
$\frac{7}{8}$″	$\frac{1}{32}$″	$\frac{11}{16}$″	$\frac{3}{4}$″	$4\frac{3}{8}$″
1″	$\frac{1}{32}$″	$\frac{3}{4}$″	$\frac{3}{4}$″	$4\frac{1}{2}$″

TURRET ATTACHMENT—Hand Indexing

This attachment is very useful when making quantities of small duplicate parts where several operations are to be performed, such as turning, drilling, reaming, tapping, counterboring, knurling and threading. A lathe equipped with turret, cutting off and forming slide, lever chuck closer, and oil pan and floor legs, as illustrated in Fig. 45, becomes an efficient and accurate hand screw machine of ¾" round stock capacity on which screws, nuts, studs, washers and innumerable small parts can conveniently be made.

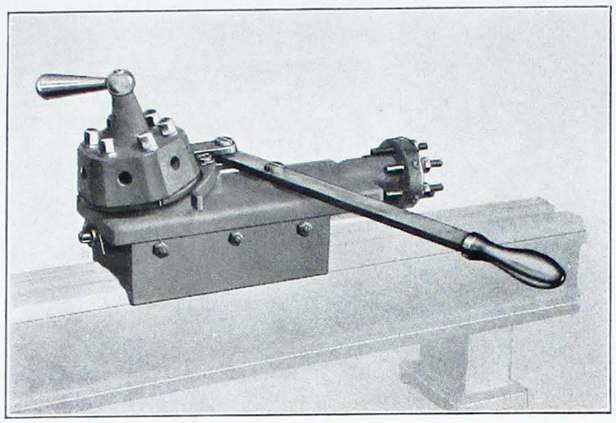

Fig. 85. Turret Attachment—Hand Indexing.

The head is tilted to provide ample clearance for turret tools such as die and tapholders, drill chucks and box turning tools. The six holes are ⅝" in diameter, 1" deep, and accommodate standard Brown & Sharpe turret tools as well as those made by us as illustrated in Figs. 87 to 91. Tools are clamped in the head by an ingenious and powerful sleeve device operated by hexagonal studs and a wrench provided. The head is indexed by hand by raising the pawl with the thumb and turning the head until the pawl engages the notches in the index plate under the head. The head is then securely locked by the hand lever on top of the head. Six adjustable stops, numbered to correspond with the turret holes, are indexed by hand, the independent stops adding to the convenience of setting up the tools. The slide, dovetailed and gibbed to the base, is moved by a long powerful hand lever. The turret is clamped in any position on the bed of the lathe by two studs passing through the bed.

Simple, rugged and comparatively inexpensive, this attachment is designed for maximum capacity in operation and will perform any work of which a bench lathe turret is capable. The motions of the hand in running the device are co-ordinated to permit great rapidity and ease.

SPECIFICATIONS

Length of Base	7½"
Length of Slide	11⅞"
Travel of Slide, maximum	3"
Number of holes for tools	6
Diameter and depth of tool holes	⅝" x 1"
Distance between turret face and headstock spindle, maximum	14½"

Net Weight, 40 Lbs.

TURRET ATTACHMENT—Automatic Indexing

This turret attachment is offered to those who wish the added convenience of automatic indexing of the turret head and independent stops. The head and stops automatically index when the slide is moved backward by the long hand lever. The head is of the flat type with six tool holes ⅝" diameter and has the same tool-clamping and head-locking device as the hand indexing turret.

SPECIFICATIONS

Length of Base	9⅝"
Length of Slide	15"
Travel of Slide, maximum	3 ¾"
Travel of Slide, used in indexing	1 5/16"
Travel of Slide, available for work	2 7/16"
Number of holes for tools	6"
Diameter and depth of tool holes	⅝" x 1"
Distance between turret face and headstock spindle, maximum	13¼"

Net Weight, 44 Lbs.

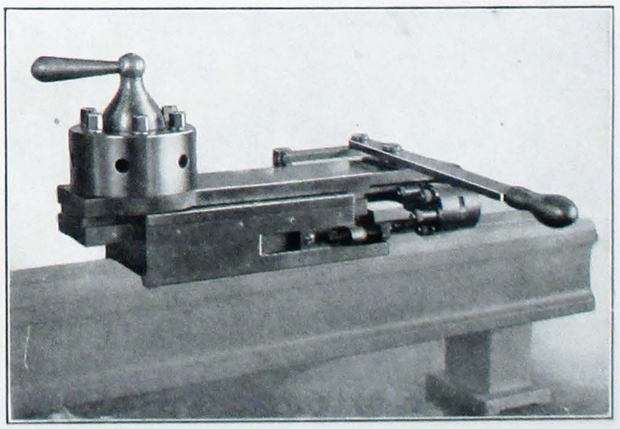

Fig. 86. Turret Attachment—Automatic Indexing.

BOX TOOL

This style of box tool is used in either turret attachment for general work, turning one diameter. The shank is 5/8" diameter, 1 1/2" long, with clearance hole 11/32" diameter so that a turned diameter of 5/16" will pass through. The blade 5/16" square is held by a clamp and screw. The front is bored to take various sizes of bushings to act as a guide and steady rest for the rough stock. One bushing and one high speed steel blade furnished.

SPECIFICATIONS

Diameter of stock that can be turned	1/2"
Diameter that will pass through shank	5/16"
Length that can be turned—diameter 5/16" and under	2 7/8"
Length that can be turned—over 5/16" diameter	1 1/16"
Length of body	2"
Length of shank	1 1/2"
Diameter of shank	5/8"
Diameter of hole for guide bushing	3/4"
Diameter of hole through shank	11/32"
Size of cutting tool—Square	5/16"

Net Weight, 1 1/4 Lbs.

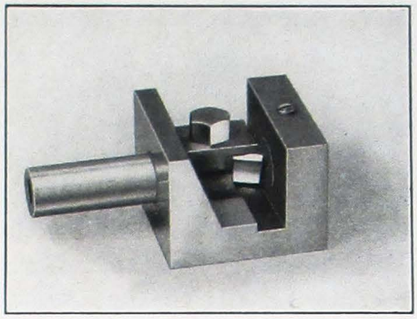

Fig. 87. Box Tool.

TAP HOLDER

This Tap Holder is of the releasing type with an improved clutch mechanism which avoids the hard shock and jar usual with such tools when released. All parts subject to wear are hardened. By using different sizes of bushings, this holder will accommodate all sizes of taps up to maximum capacity. One blank bushing is furnished.

SPECIFICATIONS

Diameter of hole for tap or bushing	1/2"
Depth of hole	1/2"
Length of body	1 1/16"
Diameter of shank	5/8"
Length of shank	1 1/8"

Net Weight, 1/2 Lb.

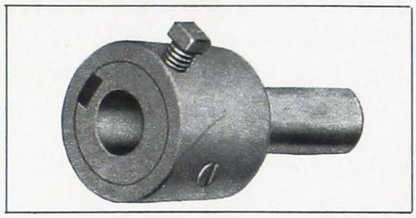

Fig. 88. Tap Holder.

DIE HOLDER

This Die Holder is of the releasing type with an improved clutch mechanism which prevents shock on releasing. All parts subject to wear are hardened.

SPECIFICATIONS

Capacity—Diameter of thread	1/4"
Capacity—Length of thread	3/4"
Length of body	1 7/16"
Diameter of shank	5/8"
Length of shank	1 1/8"
Dies used—Carpenter's stock sizes	1/4" x 5/8"

Net Weight, 1/2 Lb.

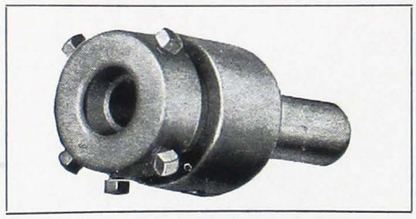

Fig. 89. Die Holder.

KNURLING TOOL

The knurls in this tool are mounted in swivelling holders adjustable to any angle, to produce straight spiral, or diamond knurling, using ordinary straight knurling rolls. The holders have screw adjustment for setting to any diameter of work within capacity. The shank is arranged to take a bushing for holding end or internal cutting tools for operations to be combined with knurling. One pair of knurls is furnished.

SPECIFICATIONS

Diameter of shank	5/8"
Length of shank	1 1/8"
Diameter will knurl, to	3/8"
Length will knurl	3/4"
Length of body	1 5/8"

Net Weight, 3/4 Lb.

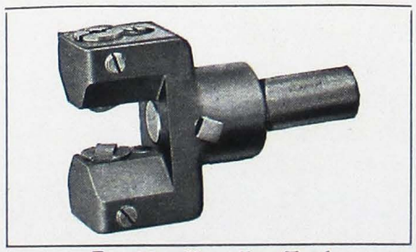

Fig. 90. Knurling Tool.

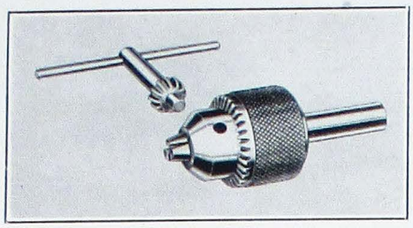

Fig. 91. Drill Chuck on straight shank.

DRILL CHUCKS

Drill Chucks for holding drills, reamers, counterbores, etc., can be furnished in three sizes of the following capacities, 0-13/64", 0-21/64", and 0-17/32". Each chuck is mounted on a straight shank 5/8" diameter 1 1/8" long to fit either turret attachment. These chucks are a standard make of improved type with hardened jaws. Wrench is included.

Net Weight, 0-13/64", 5/8 Lb. 0-21/64", 1 1/4 Lbs. 0-17/32", 2 3/4 Lbs.

CUTTING-OFF AND FORMING SLIDE

This attachment, sometimes called a double slide rest or double tool cross slide, is very important, particularly when used with the turret attachment, for manufacturing quantities of small duplicate parts. A lathe equipped with cutting-off and forming slide, turret attachment, lever chuck closer, and oil pan and floor legs, as illustrated in Fig. 45, becomes an efficient and accurate hand screw machine or turret lathe, more adaptable to the rapid production of small parts than most of the larger and more cumbersome machines.

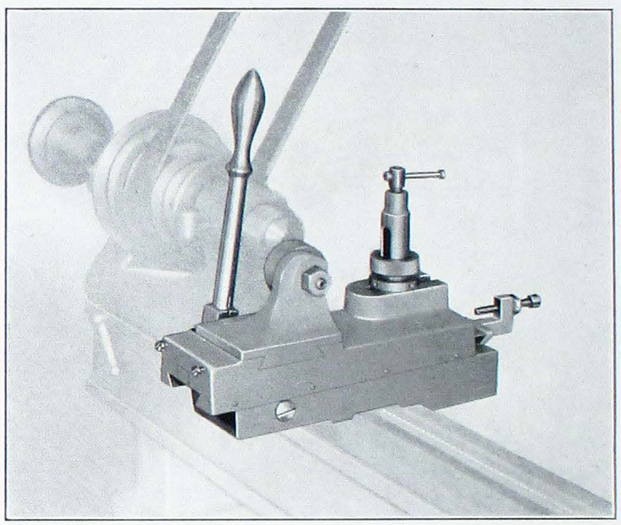

Fig. 92. Cutting-off and Forming Slide.

The base of the attachment fits crosswise on the lathe bed and is held by a stud, washer and nut. Dovetailed and gibbed to the base is a cross slide with a movement of 3 1/2", accomplished by a rack and pinion operated by a hand lever. A holder for a circular forming tool is dovetailed and gibbed to the cross slide and is adjustable in position lengthwise so that the forming tool can readily be located in proper relation with the cutting-off tool. The forming tool should be turned to the desired form and milled out to produce a cutting edge on a line 5/32" below the center line of the tool. A blank forming tool is furnished 3/4" wide. Cuts of this width can be made without strain or chatter as this attachment is very rigid and powerful. An adjustable stop, limiting the travel of the cross slide, makes it possible to form any number of duplicate pieces to the same diameter.

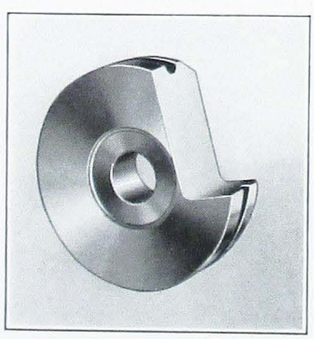

Fig. 93. Forming Tool.

The rear tool holder is usually used for holding a cutting-off tool or a combination cutting-off and rounding tool, either of which can be ground from standard 3/8" square tool bits. The holder is clamped in a T slot which allows it a latitude of location of 1 3/4". The tool, working from the rear, is mounted with cutting edge down, and as it is very essential that a cutting-off tool have its cutting edge exactly on the center line of the work, we have provided a threaded adjusting nut to raise and lower the tool.

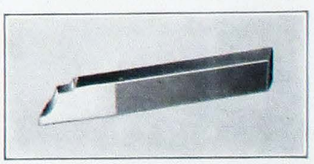

Fig. 94. Cutting-off and Rounding Tool.

SPECIFICATIONS

Width of base	2 13/16"
Length of base	9"
Width of slide	3 1/16"
Length of slide	9"
Travel of slide	3 1/2"
Diameter of circular forming tools	1 11/16"
Width of circular forming tools, maximum	3/4"
Size of cutting-off tools, square	3/8"

Net Weight, 21 Lbs.

TEE REST

The Tee Rest (or Hand Rest) is used for supporting hand tools during various shaving and hand-tooling operations, and also in wood turning. The base clamps to the bed of the lathe in any position by means of a clamping T bolt and knob. The clamping bolt for the slide rest can be used unless the slide rest is in operation at the same time, in which case an extra bolt and knob will be required. The standard Tee is 3⅛″ long, of correct shape to give the best cutting action of the hand tools, and is clamped in the base by a lever screw binder. It is adjustable in height from ⅝″ below the center line of the lathe to ⅝″ above.

Net Weight, 1¾ Lbs.

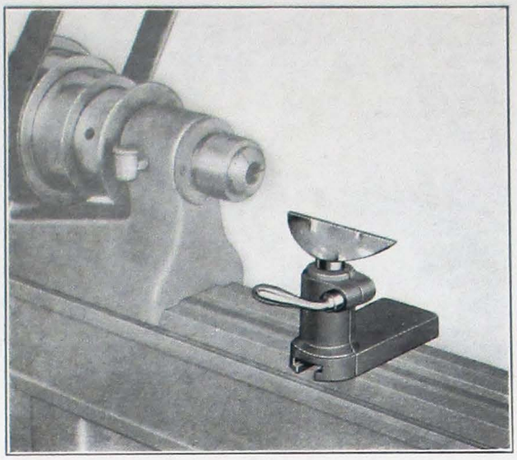

Fig. 95. Tee Rest.

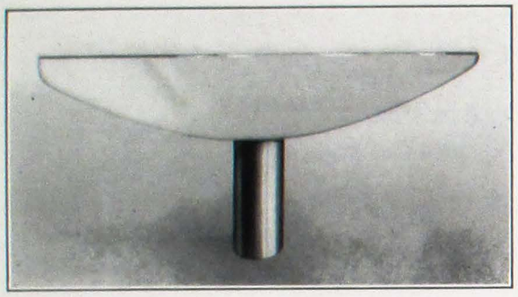

Fig. 96. Six-inch Tee.

6″ TEE

For lengthy work, particularly wood-turning, the long 6″ Tee will be found useful. It fits the regular Tee Rest base, and is adjustable in height from ½″ below the center line of the lathe to ¾″ above.

Net Weight, ¾ Lb.

L REST

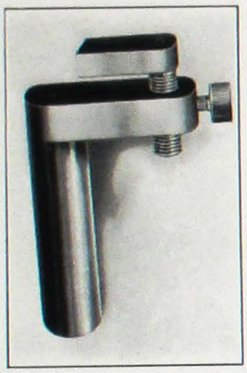

Fig. 97. L Rest

The L Rest also fits the Tee Rest Base and is indispensable for reaching difficult corners and recesses with a hand tool. The small arm is threaded so that it can be adjusted for height, independently of the further adjustment in the base of the Tee Rest, and also swivelled to the desired position. It is locked by a thumb screw. Width of arm rest 1⅛″. Length of screw 1⅛″.

Net Weight, ½ Lb.

TRIANGLE REST

The Triangle Rest or sawing table is used in the Tee Rest Base as a work rest when grinding, sawing or slitting. It is adjustable in height from ¾″ below the center line of the lathe to ½″ above. The V groove is useful when slotting heads of screws and when holding other round work. Length of sides 4⅛″.

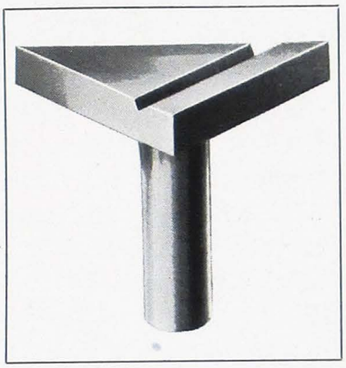

Fig. 98. Triangle Rest.

Net Weight, 1¼ Lbs.

INDEX FINGER for cutter grinding

This finger is used as a tooth rest when sharpening cutters with one of the grinding attachments mounted on the slide rest. Cutters as large as 3″ diameter can be sharpened, and as the tooth rest can be placed in any position, right or left cutters or end mills can be readily handled. The finger is made of spring tempered steel, of correct curve, set in a cylindrical rod fitting the base of the Tee Rest. This is one of the cases where an extra clamping bolt assembly is required, one to hold the slide rest and one to hold the Tee Rest Base.

Net Weight, ⅛ Lb.

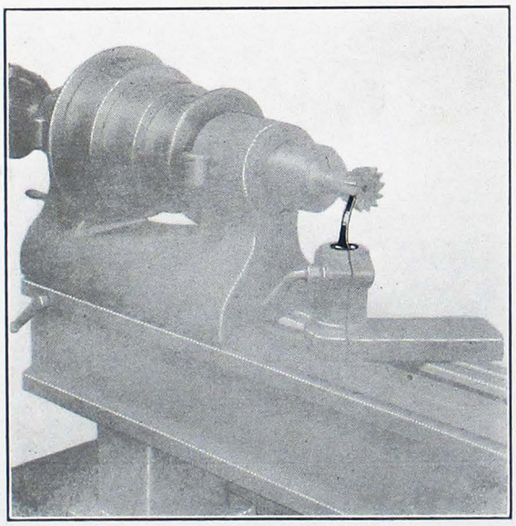

Fig. 99. Index Finger.

CLAMPING BOLT

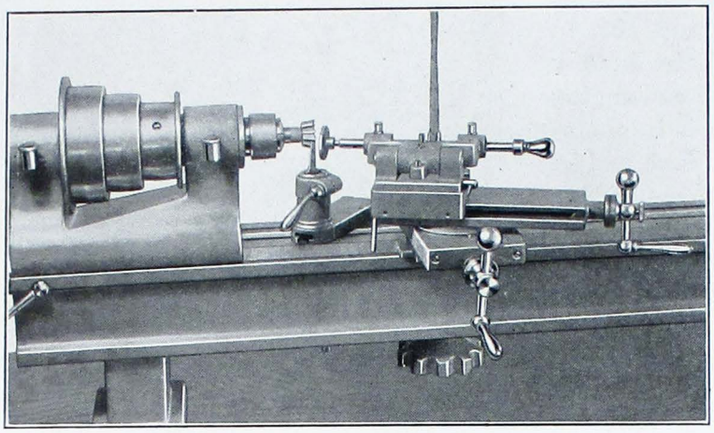

Fig. 100. Lathe arranged for sharpening cutters.

This assembly consisting of a T bolt, hand wheel and washer, is used for clamping the compound slide rest and T Rest to the bed of the lathe. A pin in the bolt prevents the bolt from turning while being tightened. One clamping bolt which can be used either for the slide rest or T Rest will usually be sufficient, but in certain cases where both slide rest and T rest are used at the same time, two are required.

Net Weight, 2½ Lbs.

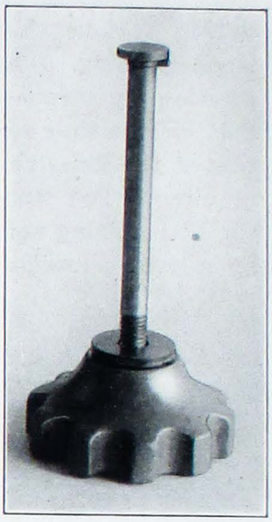

Fig. 101. Clamping Bolt.

SLOTTED FACE PLATE

The face plate is 7½″ diameter, of cast iron, with tapered hole to fit the headstock spindle. Two small screws in the hub prevent the face plate from coming off the spindle nose, whether run backward or forward, an advantage not obtained on a threaded plate. Four elongated holes and four T slots make it possible to fasten work with bolts and straps. The T slots are the same size as those on the top slide of slide rest, allowing various attachments such as vise and angle iron to be mounted.

Net Weight, 4 Lbs.

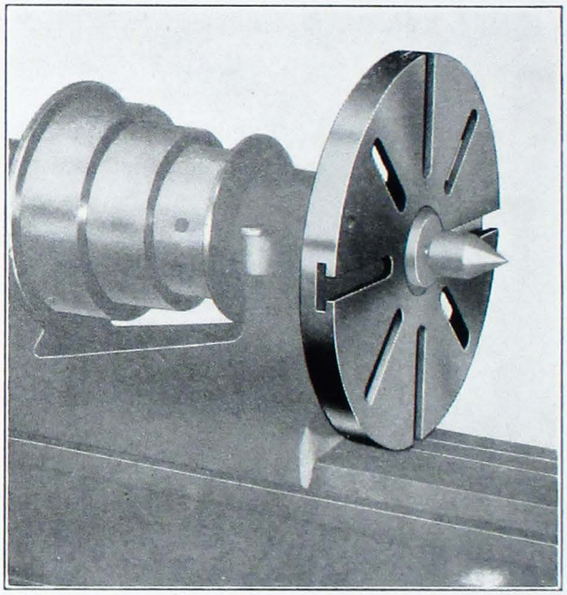

Fig. 102. Slotted Face Plate.

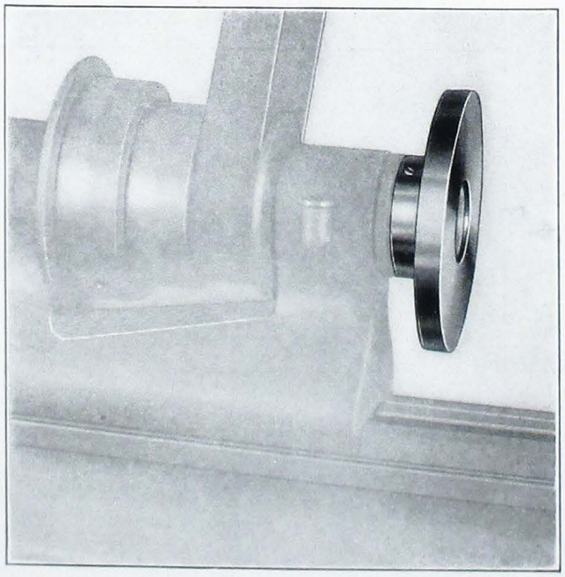

Fig. 103. Plain Face Plate.

PLAIN FACE PLATES

Plain face plates, of cast iron, are made in two sizes, 4¼″ diameter and 5⅛″ diameter, fitting the headstock spindle in the same manner as the slotted face plate. They are used to mount jaw chucks and special fixtures and may be recessed, drilled and tapped as necessary for the work at hand.

Net Weight, 4¼″ diameter, 2½ Lbs.
5⅛″ diameter, 3 Lbs.

DRIVING PLATE

The Driving Plate is similar to a plain face plate but is notched to receive a work-driving dog, and as its name indicates is used for driving work held between centers. This plate has the two small retaining screws in the hub and may be driven backwards or forwards without any danger of its loosening or coming off. It is 3¾" in diameter and the notch is ⅜" wide.

Net Weight, 1½ Lbs.

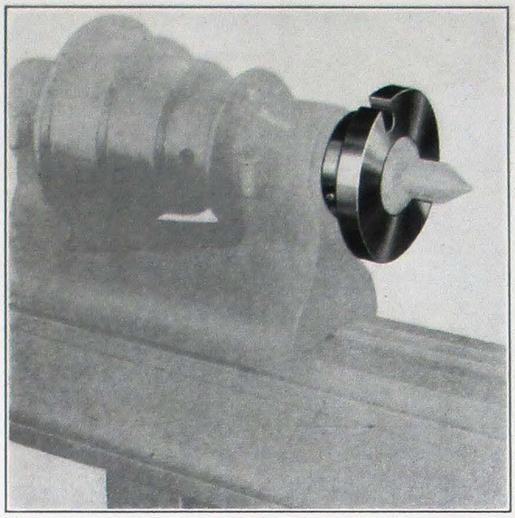

Fig. 104. Driving Plate.

MALE CENTERS

Male Centers 27/32" diameter are made both hard and soft. It is customary to use the hard center in the tailstock, the soft in the headstock. The angle is ground to 60° and the shanks are ground to fit the tapers in the tailstock spindle and center chuck for headstock. The taper is our own standard, approximately 3°. In ordering, be sure to specify whether hardened or unhardened centers are desired.

Net Weight, ⅜ Lb.

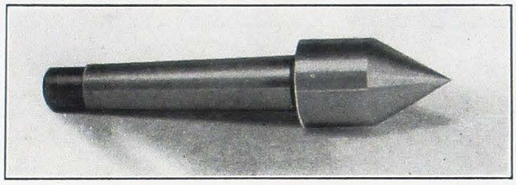

Fig. 105. Male Center.

CENTER AND CENTER CHUCK

The center for the headstock does not fit directly into the headstock spindle since the spindle is ground to suitable size and shape to receive the collets, but is inserted in a solid collet having a taper hole which in turn is held in the headstock spindle by the draw-in-spindle. The unit illustrated in Fig. 106 consists of a taper hole collet as shown in Fig. 50 and a soft male center as shown in Fig. 105 and is offered as a unit for convenience sake as both are required on an original installation if work is to be held between centers.

Net Weight, 1 Lb.

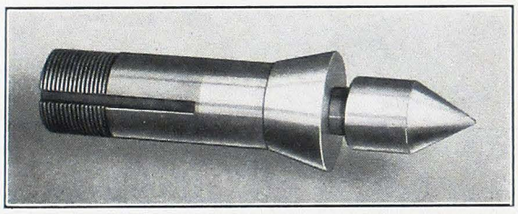

Fig. 106. Soft Male Center with Center Chuck.

BLANK CENTER

The head of the blank center is left unfinished and soft so that a customer may turn it to the form desired. Blank centers are used not only for making centers of special form or angles but also as mounts for drill chucks and special devices. They can be used also as 1" drill pads. The head is 1" diameter, 1⅜" long and the shank is the standard fitting tailstock spindle and headstock center chuck.

Net Weight, ⅜ Lb.

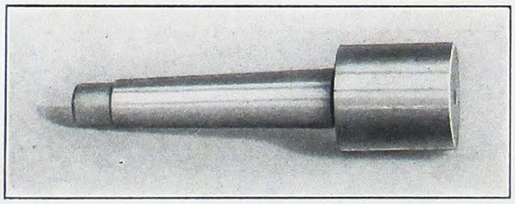

Fig. 107. Blank Center.

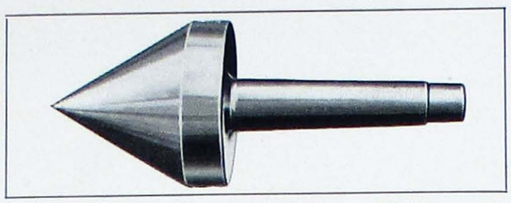

Fig. 108. Large Male Center-Hard.

LARGE MALE CENTER

This male center is hardened and has an extra large head 1½" diameter with 60° angle. It is used when turning tubing or pieces with holes too large to run on the standard centers. It fits both the tailstock spindle and headstock center chuck.

Net Weight, ⅝ Lb.

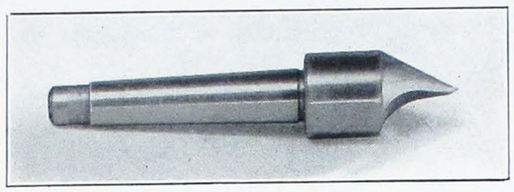

Fig. 109. Half Male Center.

HALF MALE CENTER

The half male center has a hardened head 27/32" in diameter, half cut away to leave only a small point, providing a clearance for the turning tool when facing the ends of bars or shafts. It is useful also when grinding externally as the wheel can pass the center on small work.

Net Weight, ¼ Lb.

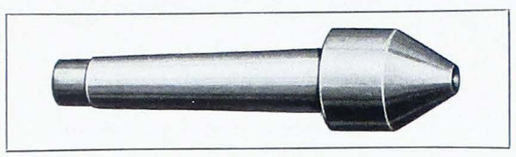

Fig. 110. Female Center.

FEMALE CENTER

The head of the Female Center is hard and 27/32" in diameter. Instead of having a sharp point, it has a 60° conical hole 3/16" in diameter at its large end. It is used for work which cannot have the usual center holes but does or can have a conical projection.

Net Weight, ⅜ Lb.

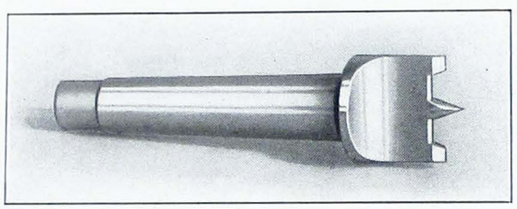

Fig. 111. Spur Center.

SPUR CENTER

The Spur Center has a conical center point and two knife points and is used principally in the headstock center chuck in wood turning, the points digging into the wood and driving it.

Net Weight, ¼ Lb.

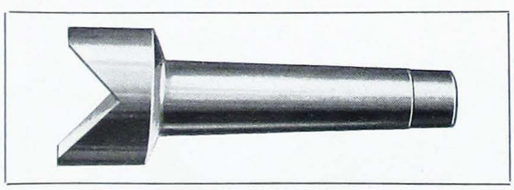

Fig. 112. Solid V Center.

SOLID V CENTER

The head of the V Center is 1 1/16" in diameter and has a 90° included angle ⅞" wide at its large end. This center is used in the tailstock for holding cylindrical work such as bars and shafts when drilling and spotting.

Net Weight, ½ Lb.

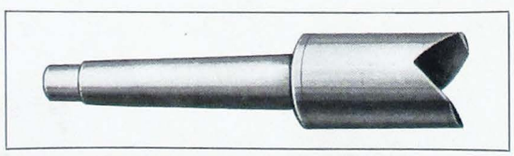

Fig. 113. Revolvable V Center.

REVOLVABLE V CENTER

The Revolvable V Center is the same as the solid V except that the head is free to turn on the shank, thus permitting the V immediately to position itself to the way the work is held in the hand.

Net Weight, ½ Lb.

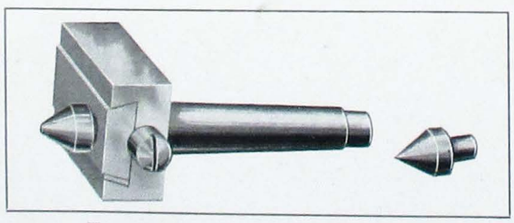

Fig. 114. Adjustable Off Center.

ADJUSTABLE OFF CENTER

On the Adjustable Off Center, the center point is carried on a slide, adjustable by means of a screw, allowing the center to be offset from the center line of the shank a maximum of ¼". By using it in the tailstock, tapers can be turned, and with adjustable off centers mounted in both headstock and tailstock, set with equal offsets, eccentrics can be turned or ground. It is furnished with removable male and female centers ½" in diameter.

Net Weight, ⅝ Lb.

DRILL PLATES

Drill Plates are made in four sizes 2", 3", 4" and 5" diameter mounted on shanks to fit both tailstock spindle and headstock center chuck. The plates are cast iron and the shanks are steel accurately ground. They are used as a back support for work being drilled with a drill in the headstock. By fastening guide and stop strips to the plate, duplicate parts can be as quickly and accurately drilled as if jigged.

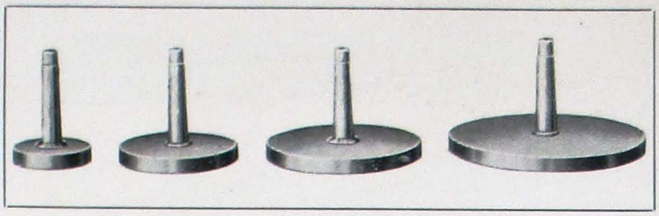

Fig. 115. Drill Plates 2", 3", 4", 5" in diameter

Net Weight 2", ½ Lb. 3", ⅞ Lb. 4", 1¼ Lb. 5", 2 Lbs.

STEADY REST

The Steady Rest is indispensable for supporting long cylindrical work held between the centers of the lathe when there is a tendency for the work to spring under a cutting tool, and also for supporting work when it is desired to perform an operation on one end which prevents the use of a tailstock center. An example is the boring and threading of a hole in a shaft. The body of the steady rest is a casting, planed to fit the top of the lathe bed, and provided with a T bolt and nut for fastening thereto. The three jaws are made of round brass ½" diameter, beveled at the ends, and slide in reamed holes in the main casting. Approximate adjustment is made by sliding the jaws by hand, but fine setting is by screw adjustment which makes it much easier to set the jaws on this attachment than on the usual steady rest having elongated holes in the jaws and nothing to prevent them dropping out of line as soon as they are loosened. The capacity of the steady rest is 3" diameter.

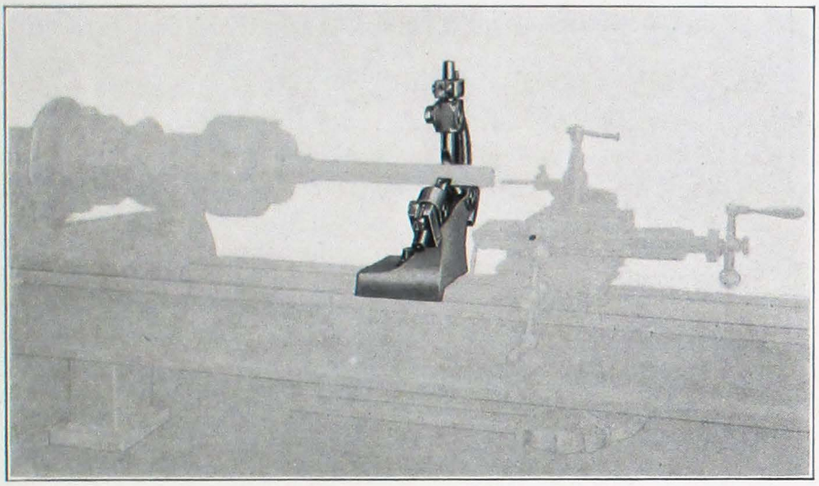

Fig. 116. Steady Rest.

Net Weight, 5½ Lbs.

TAILSTOCK LEVER ATTACHMENT

A tailstock with lever instead of screw movement is a considerable aid to production where there is a quantity of small pieces to be drilled, tapped, counterbored, etc. It has been customary when a lever tailstock was required to supply a complete tailstock, priced accordingly, but this simple and inexpensive attachment fits the standard tailstock so that a screw tailstock can be converted to lever tailstock and vice versa in a few minutes. To convert the screw tailstock to lever, remove handwheel, cap and screw. Thread into the tailstock spindle nut the spindle furnished with the lever attachment and replace the end cap. Remove tailstock spindle binder bolt and bushing and mount lever bracket on stud and insert in spindle binder bolt hole. Slip lever swivel bushing over spindle, and clamp in desired position by tightening hexagonal nut. The swivel bushing can be located to act as a forward stop to control distance that drill enters work and to insure uniformity of depth. When the tailstock spindle is moved back to its limit, the drill chuck or other tool is automatically knocked out making it possible to change tools quickly for a number of consecutive operations. Maximum travel of tailstock spindle is 3".

Net Weight, 3 Lbs.

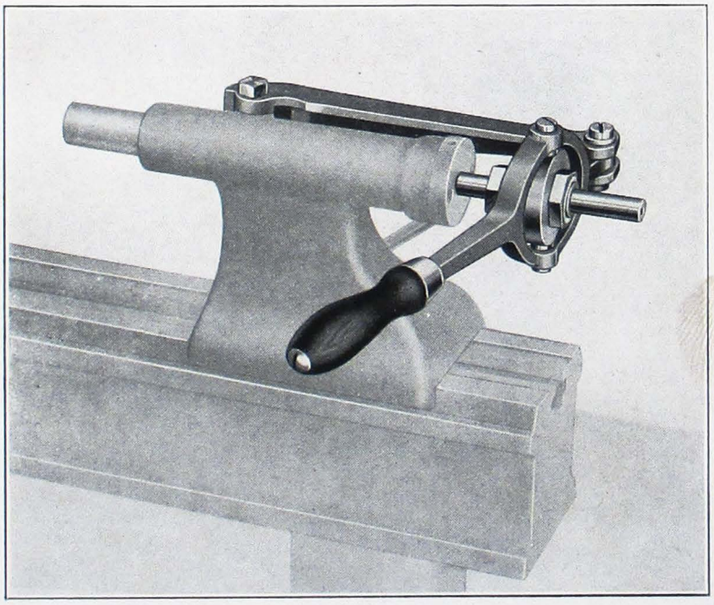

Fig. 117. Tailstock Lever Attachment.

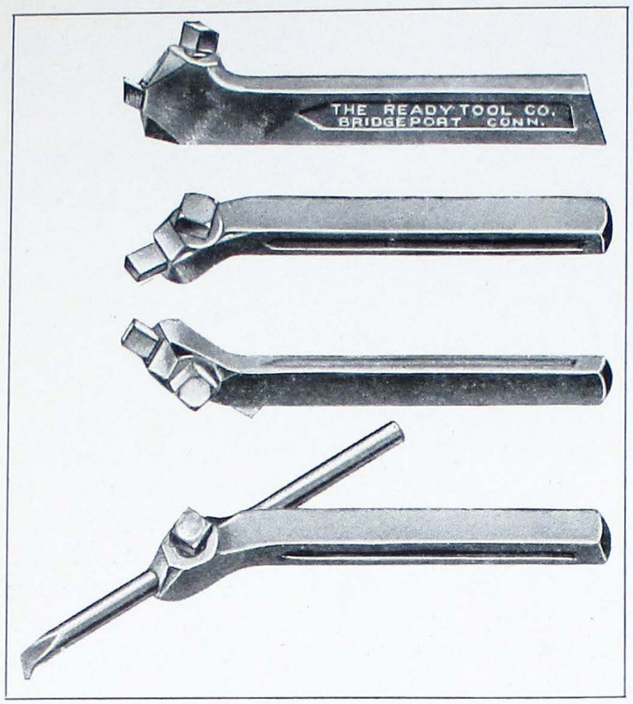

Fig. 118. Tool Holders.

TOOL HOLDERS

We offer the Red-E Style 00 Tool Holders, designed especially for use on bench lathes to give the same time and money-saving features that have made the larger holders so popular with engine lathe users. These holders are just the right size for bench lathes, 5/16″ x ½″ x 4″, made from a fine quality drop forging, broached with a true, square hole for the bit. Four shapes of holders are made, straight, right hand offset, left hand offset and boring, the first three taking 3/16″ square high speed steel bits which can be ground to any desired shape and used close up to the ends with little waste. Extra blank bits can be supplied at nominal cost. The boring tool requires a simple inexpensive boring bar. Any one who has used these handy adaptable holders, will never go back to old fashioned forged tools.

Net Weight—Holder, ¼ Lb.
Bits per doz., ¼ Lb.
Boring Bars per doz., ¾ Lb.

KNURLING TOOL

The Knurling Tool, having a shank 5/16″ x ½″, fits the rocker tool post of the slide rest. The knurls are hardened, ⅞″ diameter and 3/16″ wide. Three knurling rolls are furnished with fine, medium and coarse knurling, all 45° diagonal. The rolls are carried on a threaded stud making it easy to change the knurling rolls. Special rolls with straight and diamond cuts can be made on the milling attachment, described with Fig. 73.

Net Weight, ⅜ Lb.

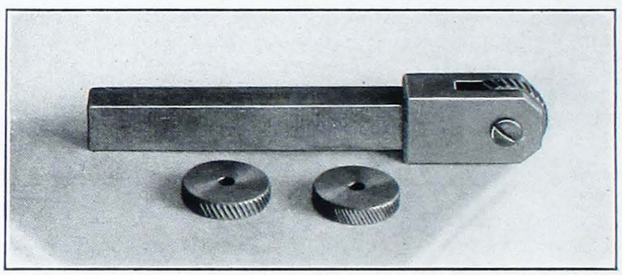

Fig. 119. Knurling Tool.

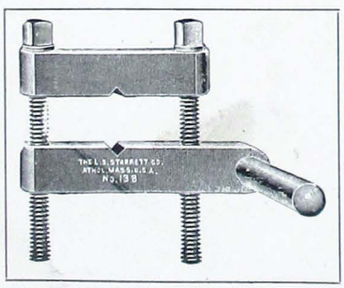

Fig. 120. Clamp Dog.

CLAMP DOG

The common variety of bent-tail forged dogs are too heavy for use on a bench lathe. We recommend, therefore, the clamp dog as illustrated in Fig. 120. It will take work up to a diameter of 1¼″, and the tail is located to engage properly in the slot on the driving plate. It is made of steel and case hardened throughout.

Net Weight, ¼ Lb.

Other Standard

Rivett

Products

"Precision" Plain Bench Lathes
"Precision" Back Geared Screw Cutting Lathes
Internal Grinding Machines
Radial or Ball Race Grinding Machines
Threading Tools
Collets

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