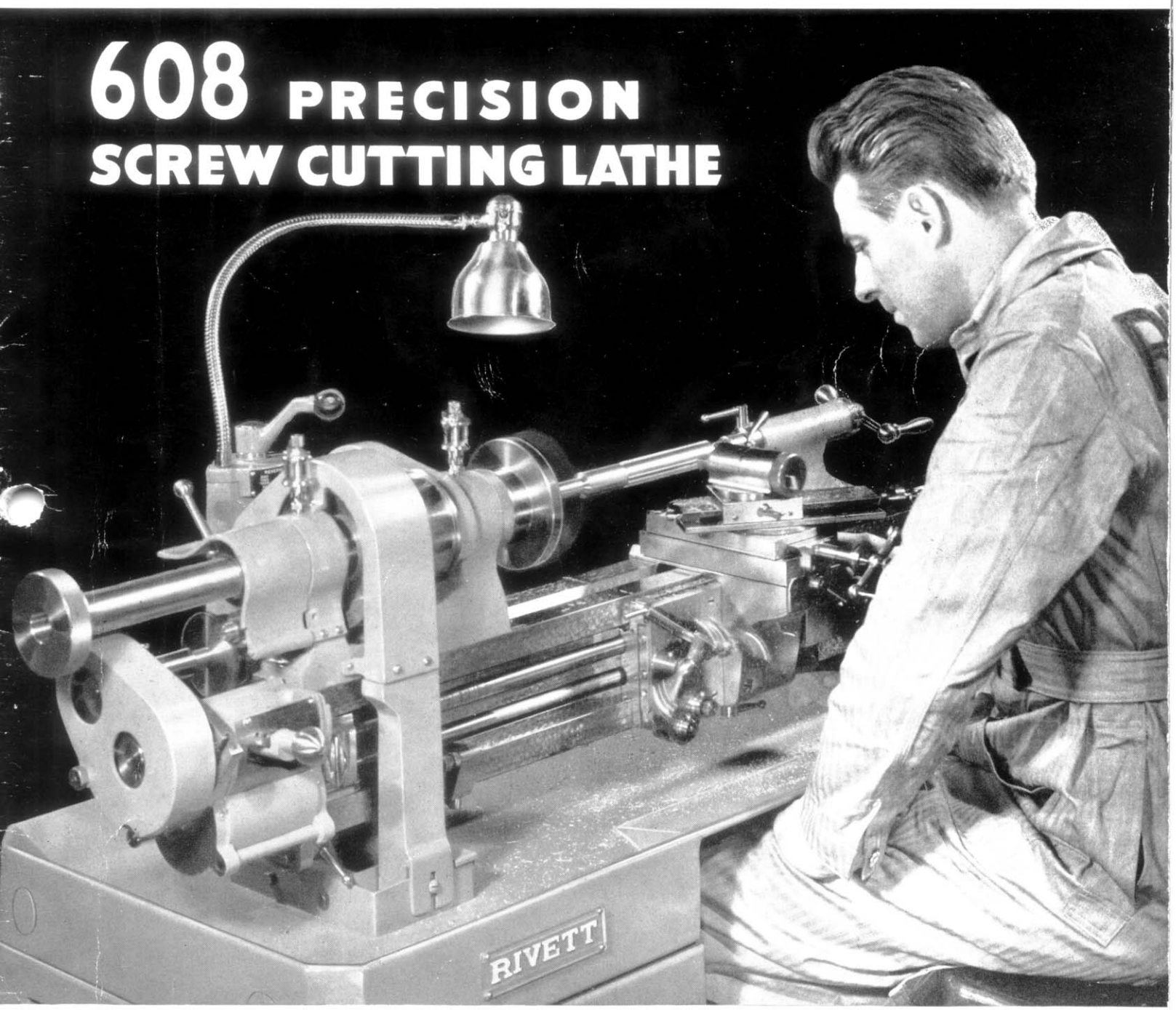
RIVETT

608 PRECISION SCREW CUTTING LATHE



RIVETT LATHE & GRINDER, Inc.

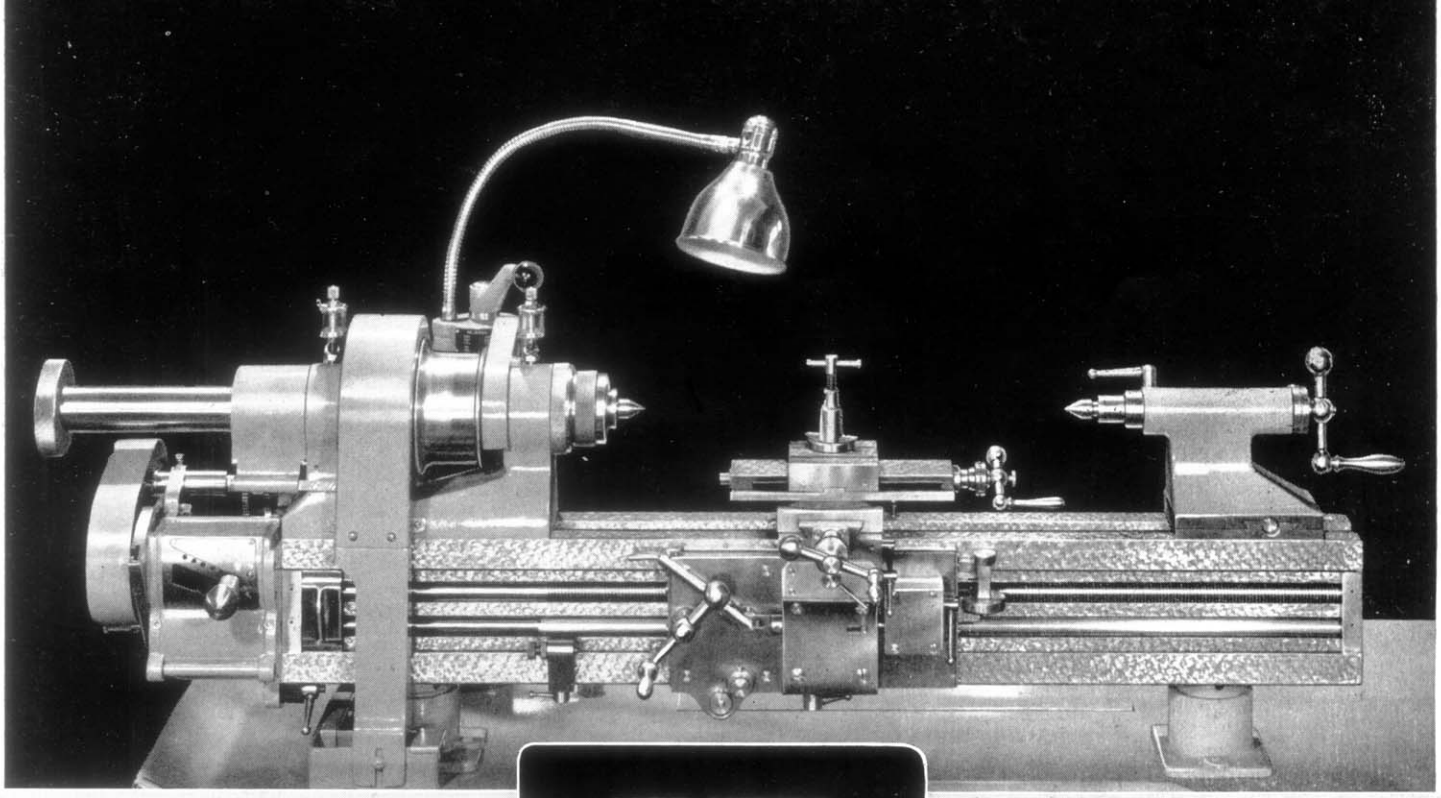
BRIGHTON 35 • BOSTON • MASS.

BULLETIN NO. 608F

The first Rivett precision screw cutting lathe was made in 1888. For sixty years its builders have sought to perfect its every feature in pace with the progress of the times. Long experience in service throughout the world and the demands for closer limits of accuracy than were dreamed of by our forefathers have dictated increasing fineness of workmanship. Improvements in available materials and in measuring and inspecting instruments have contributed to its development.

The aim of the engineers who sponsor it today is to offer a machine capable of producing in laboratory, on shipboard or in manufacturing department a very wide range of true precision parts — "The Master Workman's Master Tool."

But their ambition is not limited merely to making a lathe which when new will be the most accurate product of its type. A much less costly design would answer that requirement. The "608" is built today as in the past by expert mechanics. Every component part is rigidly checked. The assembly is critically tested for performance within the guaranteed limits and above all "608" is so proportioned as to retain its inherent accuracy through years of intelligent use — to embody long-life precision.



LATHE ASSEMBLY

Fig. 1

Manufacturers, governments and scientists employ the Rivett 608 for fine production, repair and experimental work. A greater number of modern mechanical marvels have been developed on this small lathe than on all other machine tools combined. Technical instructors of machine shop practice in engineer training departments and in vocational schools and colleges find "608" the finest demonstrator for teaching the construction, working principles and functions of lathes. In tool-making and instrument shops it will handle a great variety of jobs in minimum time. The super-finish of the lathe is not for appearance only but to inspire the high order of maintenance which it deserves.

Basically, "608" is a small but exceedingly powerful engine lathe. As such it is peculiar in having slide areas equal to those of other lathes twice its size. Its bronze-bearing spindle runs more smoothly and with greater truth than any anti-friction bearing spindle and is capable of heavy or light cuts and severe end thrusts. Finely-made attachments for milling, spiral cutting, slotting, relieving, taper turning, ball turning, grinding and forming enable its user completely to finish his work without recourse to other machines and throughout his entire series of operations to utilize the inherent precision of the lathe itself.

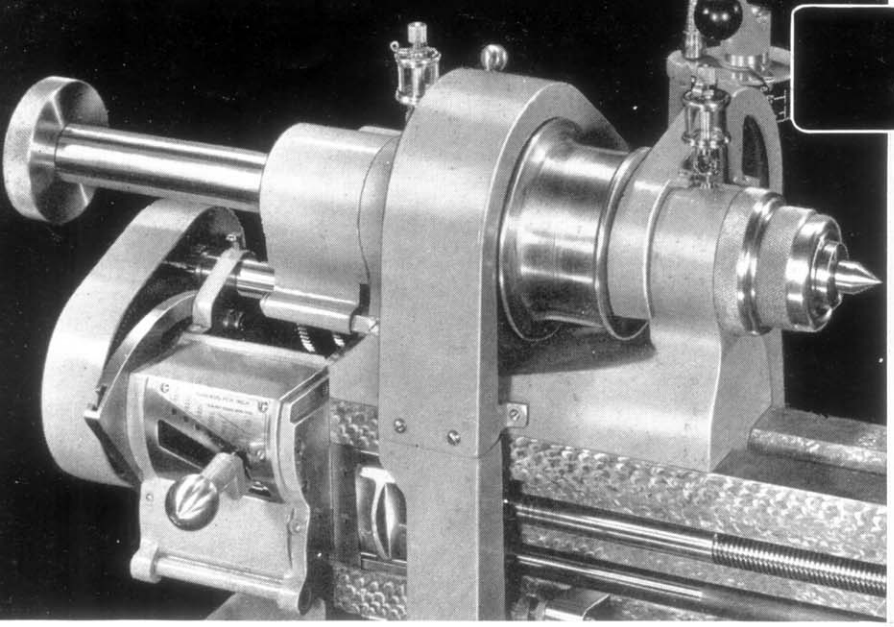
The "608" has safety interlock protecting the carriage from accidental engagement of both power feed and lead screw at one time and three-point support to assure against distortion.

The "608" is so rigidly designed, so powerfully constructed and so easily handled that it will produce not only small precision parts but surprisingly heavy work, usually put on large lathes, without the least injury to itself.

And when in the course of years it shows signs of wear, it can be entirely restored to its original perfect condition by rebuilding, for in fact it is a lathe for a lifetime.

Guarantee

The Rivett 608 will turn or bore within 0.0001″ in six inches work held in collet, and turn between centers within 0.0001″ in six inches. The Rivett 608 will face to eight inches diameter within a limit of 0.0002″ concave, 0.0000″ convex. The Rivett 608 will cut threads within 0.0005″ in twelve inches, or within 0.0003″ in any three inches, or within 0.0002″ in any inch of a specimen piece.



HEADSTOCK
VEE BELT DRIVE

Fig. 2

The headstock for vee belt drive is semi-enclosed. The finished surface to right of the guard permits holding the spindle by hand or turning to inspect or measure work. The front spindle bearing is bronze, double cone, having angles of 3° and 45° with the center line. Rear bearing is straight, tapered on the outside and split for convenient adjustment. The mouth, chuck seat and threaded nose are ground with spindle running in its own bearings. Collets mount directly in spindle mouth. Plates and attachments screw onto nose and lock against shoulder of spindle.

HEADSTOCK
FLAT BELT DRIVE

The cone pulley headstock for endless flat belt, of essentially the same design as the semi-enclosed headstock, may be driven from speed box or horizontal safety drive, which latter arrangement on oak cabinet or bench also provides power for relieving attachment and, with attachment drive, for slide rest grinding attachments, traverse miller and its thread milling and spiral milling attachments.

The "608" headstock is back-geared affording a wide range of selective forward and reverse spindle speeds through gearing or by open belt.

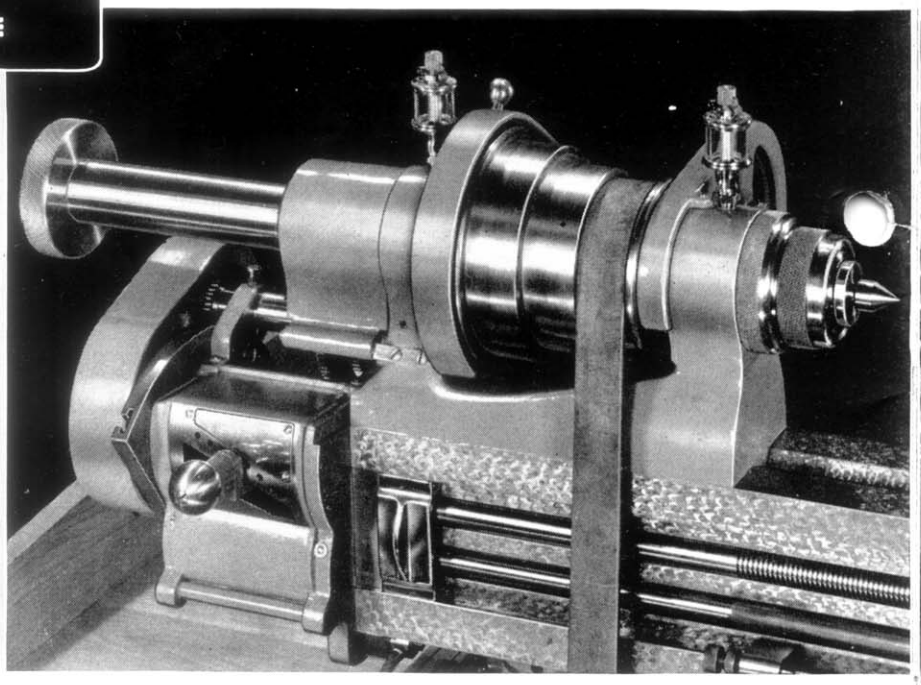
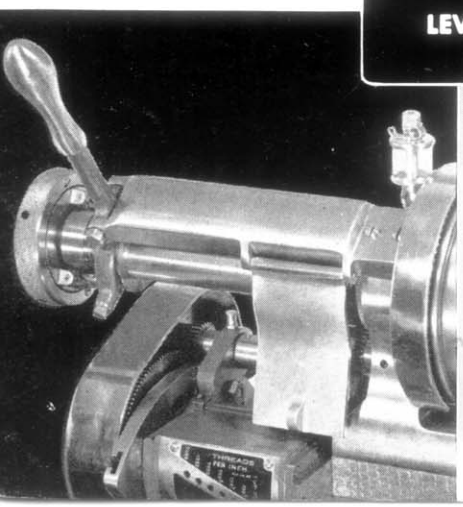


Fig. 3

LEVER CHUCK CLOSER



The lever chuck closer is used in place of screw draw-in spindle to operate collets and step chucks. It quickly and uniformly closes the collet or step chuck on the work and materially reduces wear on chuck and draw-in spindle threads as well as insuring uniform draw-in of duplicate parts having the same diameters. For toolroom and experimental work the screw draw-in spindle may be preferable, but for chucking duplicate parts the lever closer is far more efficient. It saves operator effort, productive time and spoilage.

Fig. 4

GEAR BOX

The quick change gear box is so mounted as not to interfere with vertical belt from underneath drive or telescopic driving shafts used with spiral and relieving attachments and may be replaced in the event of injury.

By sliding the stud and compound gears to detented positions and moving index lever to appropriate settings, thirty different threads from 10 to 144 pitch are available through gear box. By mounting pick-off gears on auxiliary quadrant provided, additional threads may be cut. Pick-off gears for 11½, 15 and 27 pitch threads are included with lathe — see table, Fig. 36. Metric translating gears are available — see table, Fig. 37.

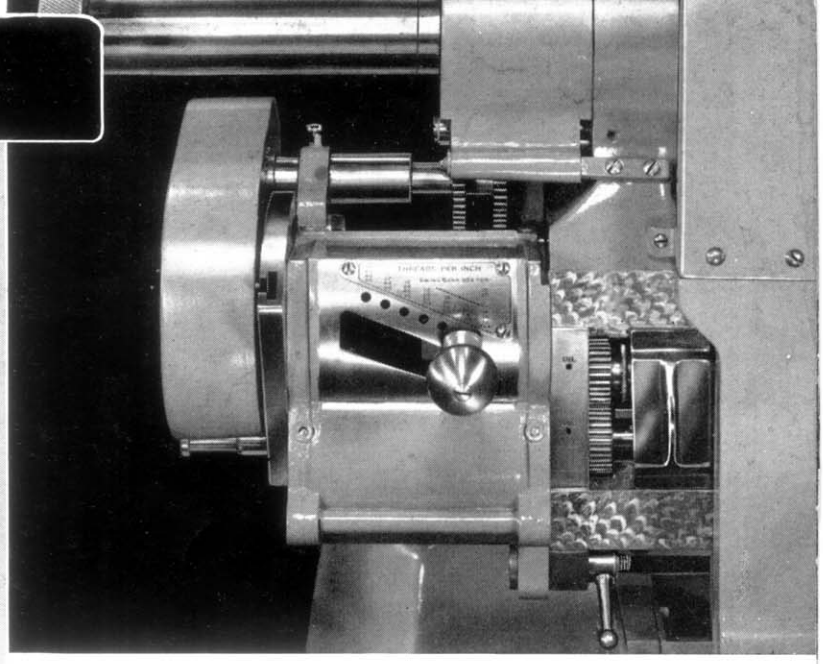
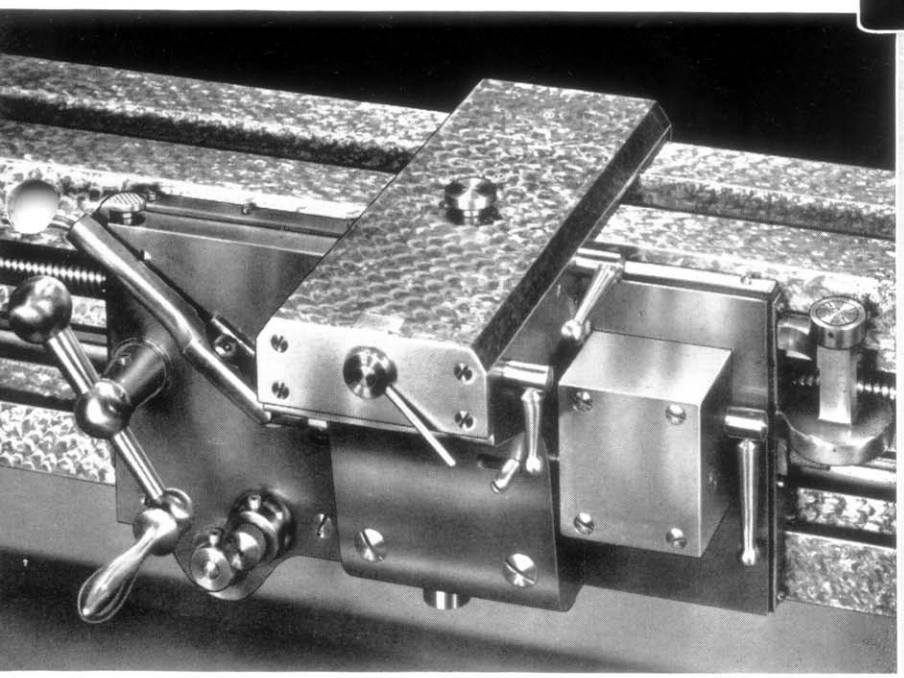


Fig. 5

CARRIAGE AND SADDLE



The carriage saddle has angular guideways scraped to provide positive and accurate mounting for the slide rest and attachments.

When cutting threads, a bronze half-nut, controlled by an eccentric lever, engages the lead screw. A threading dial is offered to pick up threads without reversing the lathe. Power longitudinal feed is from the feed rod through a friction clutch and gears to a rack. This clutch is controlled by a latched lever and may be released either by hand or automatically by an adjustable stop. Micrometer stop is available in place of standard screw stop.

Fig. 6

LATHE BED

The bed is made from a strongly-ribbed box casting of close-grained alloy iron. The top, central vee guideway, dovetail and plane surfaces on front, and plane surface on rear of bed are hand-scraped in most accurate possible relation to each other to assure equalization of bearing fundamental to long precision life. The lead screw has bearings in the end plates. An independent feed rod with a sliding gear provides power feed for the carriage without employing the lead screw, thus preserving the precision quality of the latter.

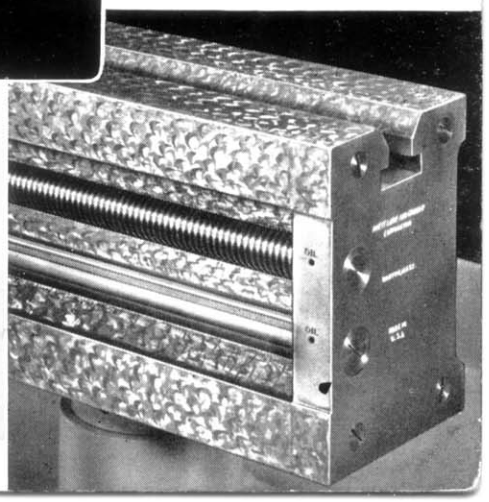
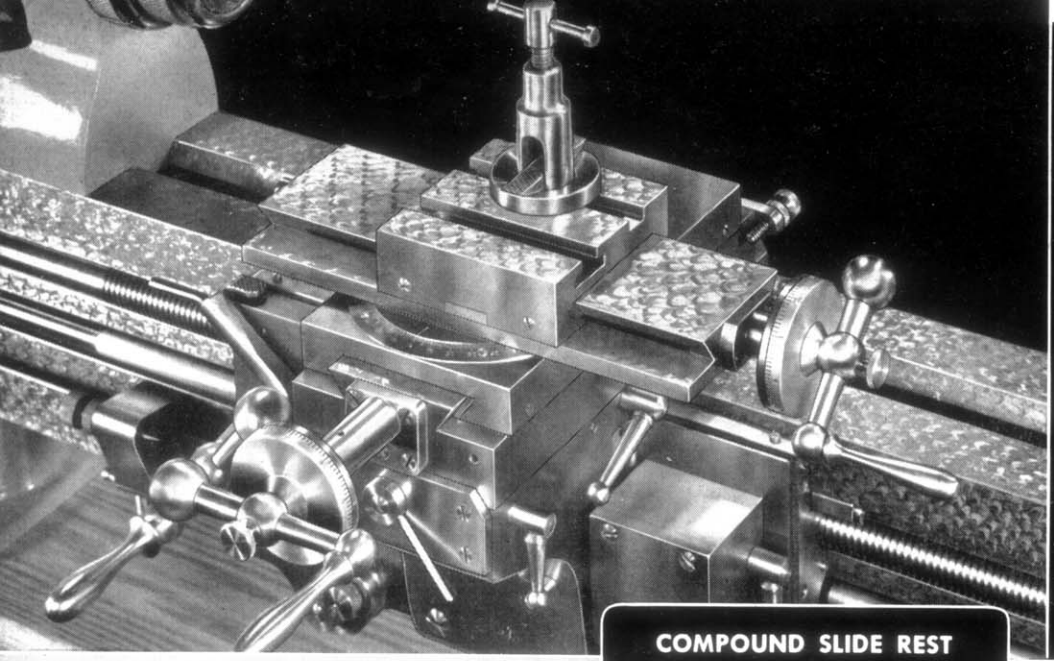
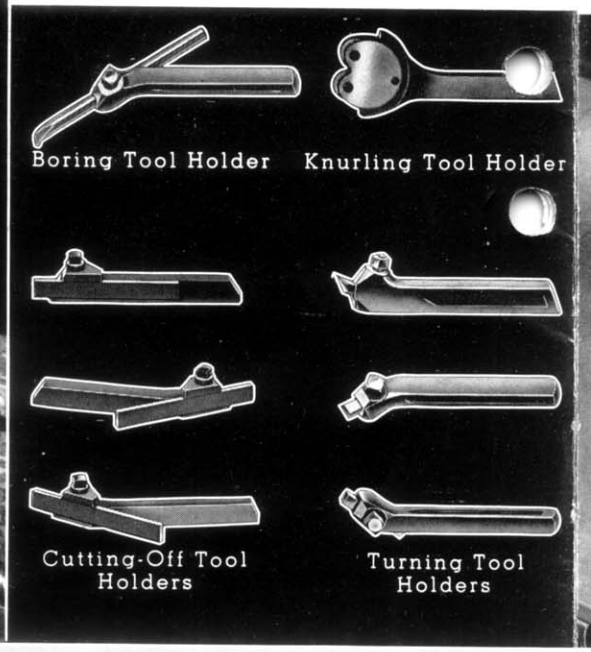


Fig. 7





COMPOUND SLIDE REST WITH ROCKER TOOL POST

Fig. 8

The compound precision slide rest consists of a base, an upper and lower slide with swivel between and feed screws to provide slide movements. It is removable as a whole from the lathe carriage to permit the use of dial gage, height gage, surface gage and other measuring and locating tools when setting-up and laying out work. With slide rest off, various attachments such as the thread tool, traverse miller, tee rest, slotting and milling fixture and universal milling attachment may be mounted on the lathe carriage. Swivel movement is registered on a bevel-edged dial graduated in degrees over the full circumference.

An adjustable stop for the lower slide is provided for thread-cutting and for repetition of sizes in turning and grinding. Provision is made at front of base to locate this stop for internal threading and duplication of boring sizes.

Slide rest may instantly be locked in any transverse location for straight boring by power feed, taper turning or boring with taper attachment, Fig. 12, and bevel turning by hand feed. For power cross feed, slide rest is located and locked flush with front of saddle, and the saddle cross feed gear is meshed with the cross feed screw driving pinion.

The eccentric tool holder attachment takes ½" round high speed steel tools and split bushing carried in an eccentric compressible sleeve. Rotation of the sleeve adjusts the height of the tool. Rotation of the tool in the sleeve gives proper rake and clearance angle settings. The attachment swivels on its binder stud and clamps in the tee slot of the slide rest top slide in place of rocker tool post. A split bushing for 5/16" square tool bits may also be used in eccentric sleeve. Straight cutter holder and angle cutter holder fit directly in 5/8" dia. of eccentric sleeve. Boring bar ½" dia. requires use of bushing.

ECCENTRIC TOOL HOLDER ATTACHMENT WITH TOOLING

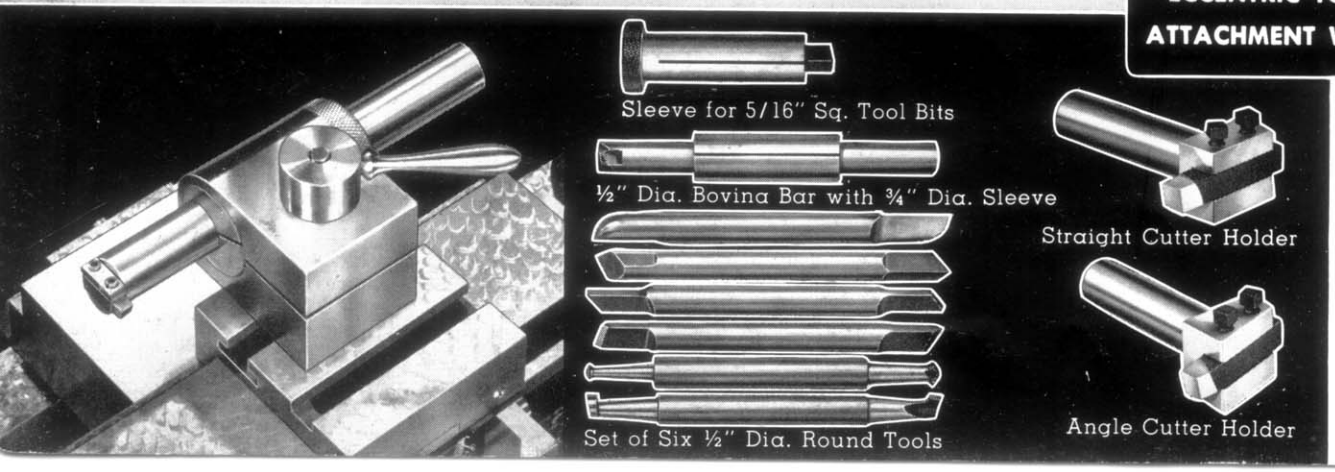
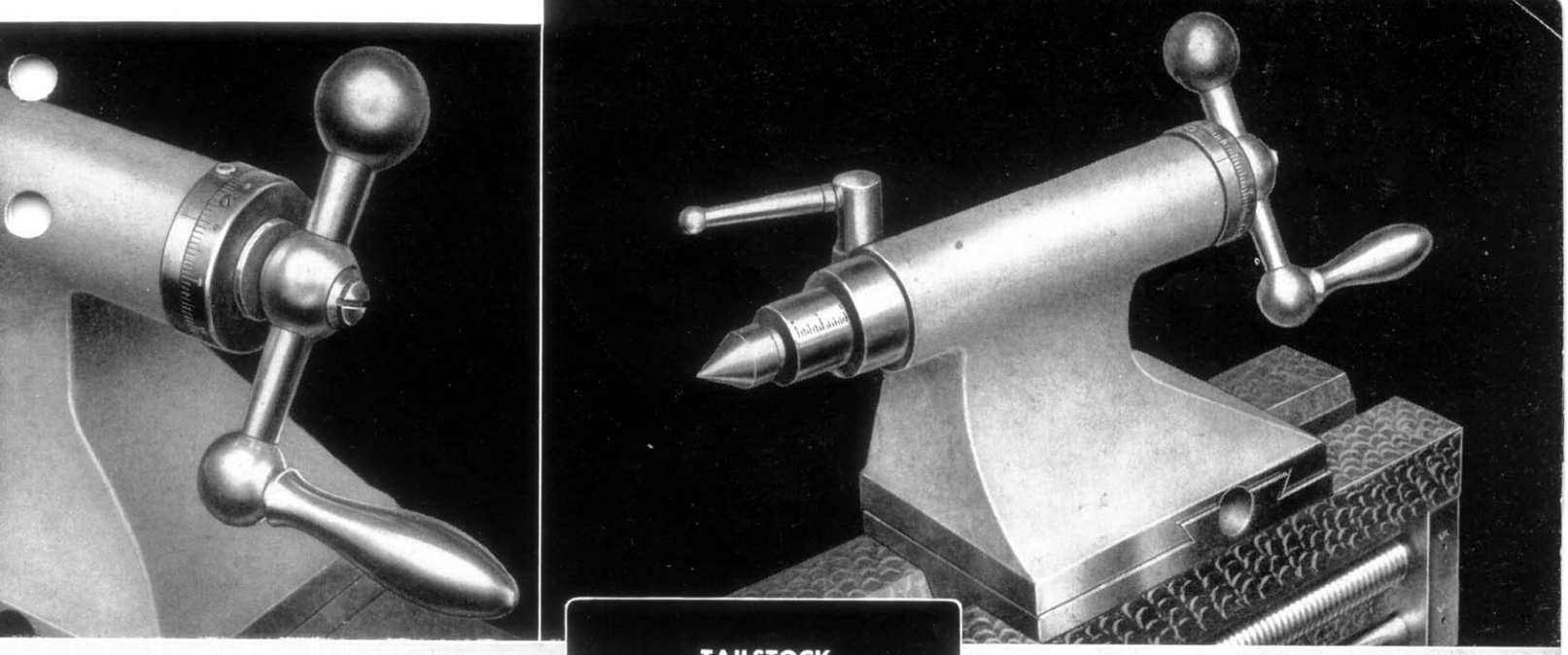


Fig. 9



TAILSTOCK

Fig. 10

The screw tailstock is offset set-over type with hardened and ground spindle traversed by a high carbon steel screw working in a bronze nut, operated by a ball handle. The tailstock frame is precision honed and is clamped in any position by an eccentric binder and T-bolt fitting a slot in the bed. Spindle movement is indicated by $\frac{1}{16}''$ graduation on spindle. For fine adjustment and duplication of setting, the spindle is fitted with a large adjustable dial graduated to .001″. The dial is provided with friction binder to permit resetting.

The set-over dove-tail slide and screw permits $\frac{5}{16}''$ movement forward. Set-over positions are used for occasional taper turning when taper attachment is not available. Conventionally, tailstock is fitted to point .00025″ higher than headstock center to provide for initial wear. The hole in the spindle is ground to Rivett special center taper gage, approximately 3° included angle. Center or other attachment is automatically ejected when spindle is fully retracted. Binder handle locks spindle.

All castings for "608" are relieved by scientific heat treatment before machining and after rough machining are seasoned for long periods of time to assure that the exacting standards of precision to which the lathe is built will not be defeated by distortion due to changes in temperature or normal shock or stresses in use.

The tailstock lever attachment takes the place of ball handle for quick and sensitive traversing of tailstock spindle, when drilling, tapping, reaming or using tailstock turret attachment, Fig. 27.

The device is typical of the many ingenious accessories which at low cost can solve a production problem where the quantity of parts required at one time does not justify putting in a special machine or even setting up a valuable automatic. The lever is easily operable while either sitting or standing.

LEVER TAILSTOCK

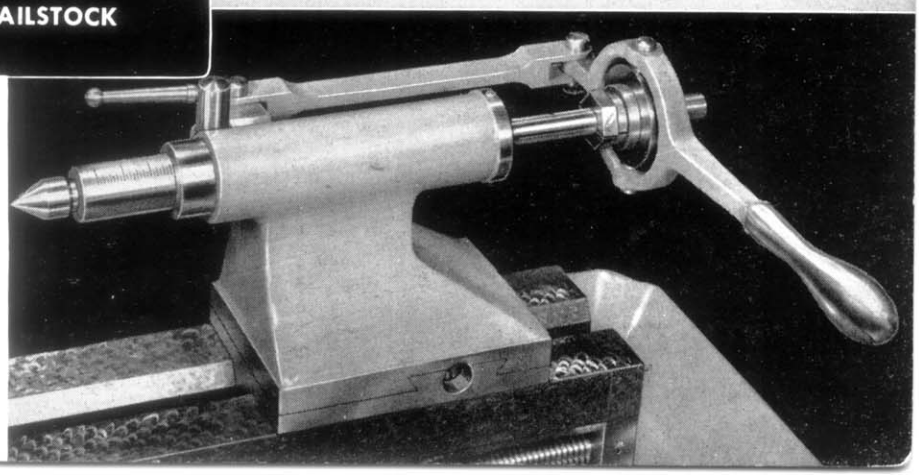


Fig. 11

TAPER ATTACHMENT

The taper attachment is extremely valuable for taper turning and boring with power feed. It affords the only means for accurate cutting of taper threads. Guide bar bracket is permanently fitted to lathe bed. Connecting yoke detachably mounts on the rear end of the slide rest cross slide. Dovetailed guide bar swivels and is graduated for setting to any angle up to 10° or 4″ per foot taper in either direction. Tapered work maximum 13″ long may be turned or threaded.

Fig. 12

GRINDING ATTACHMENTS BELT DRIVE

Slide rest grinding attachments, belt drive, are preferred to the unit motor drive attachment for lathe installations which include for other purposes either of the auxiliary overhead drives, Fig. 33 or Fig. 34.

The external attachment is for finishing straight or taper work. Spindle runs in hard bronze bearings carried in bracket having height adjustment. Bearings have take-up for wear. Grinding wheel is mounted directly on spindle and is held by a collar, flange and screw. Spindle takes wheels $\frac{3}{8}$″ hole, up to 3″ diameter x $\frac{1}{4}$″ face. Cross, longitudinal and angular feeds are by slide rest feed screws.

The internal attachment is used for grinding or lapping straight and taper holes, and for high speed drilling with tools held in drill chuck. Spindle has No. 4 P. & W. taper hole for insertion of wheel mount, wheel arbor or drill chuck.

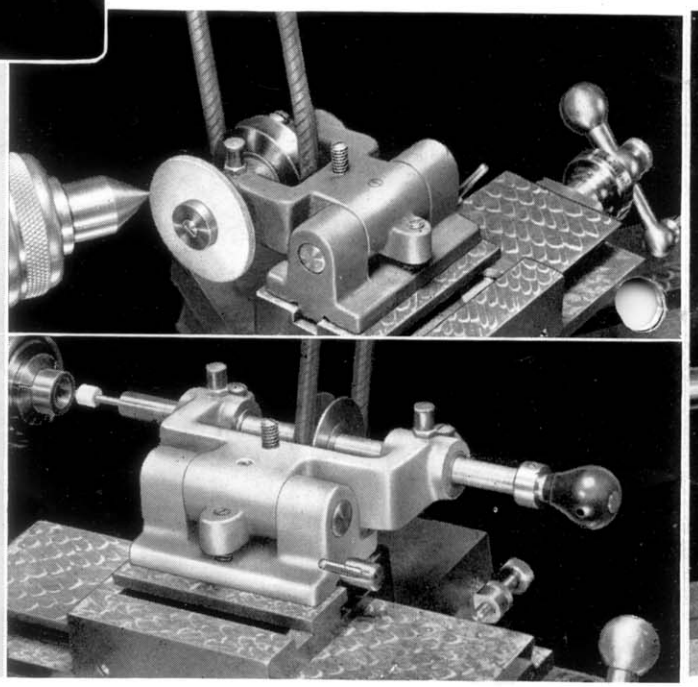


Fig. 13

GRINDING ATTACHMENT MOTOR DRIVE

The unit motor drive grinding attachment has ball bearing spindle with range 6900 to 30,000 r.p.m. Equipment includes $\frac{1}{8}$″ collet type chuck for mounted wheels, two plain wheels, three mounted wheels, motor, cord, switch and case. Motor is universal, single phase to operate on either 110-115 volts or 220-230 volts as specified.

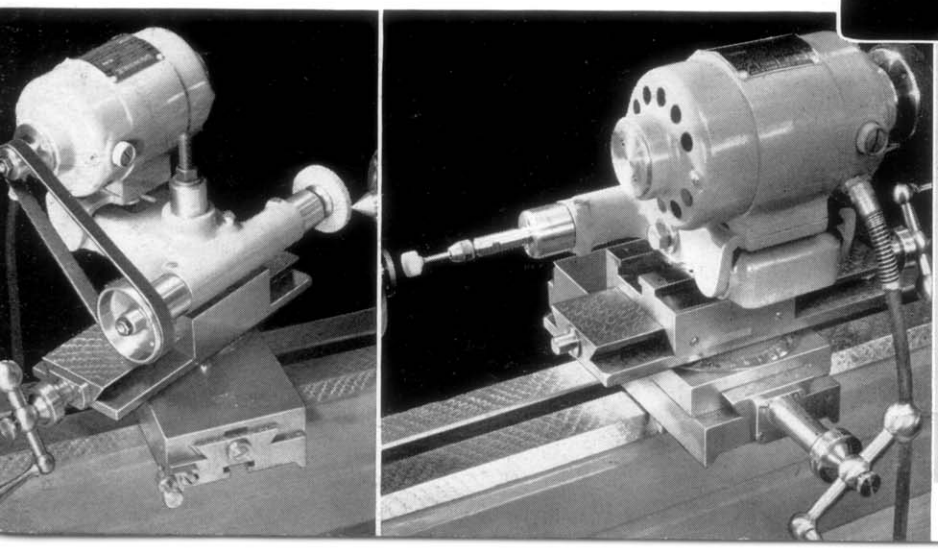


Fig. 14

BALL TURNING REST

The ball turning rest will accurately generate spherical surfaces 3″ max. dia., concave and convex. Valuable for machining ball reamers, cutters, punches, balled valve seats and discs, knuckles, universal and swing joints, knobs and hemispherical ends. It mounts directly on the bed. Lower slide has transverse screws for centering and tee slot for location of tool post. Feed screw adjusts tool position for radius. Adjustable dial graduated to .001″ is used for duplication of work.

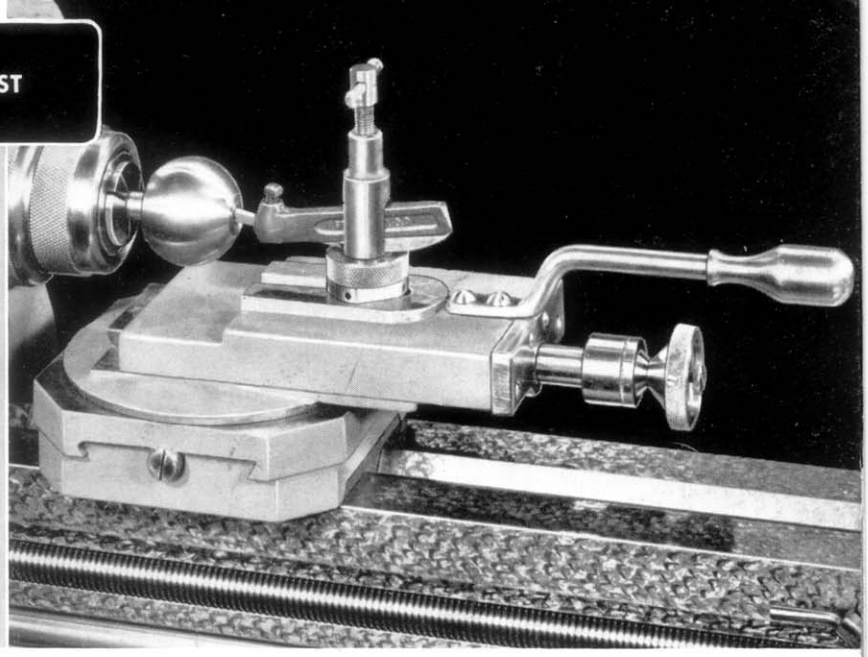


Fig. 15

THREAD TOOL

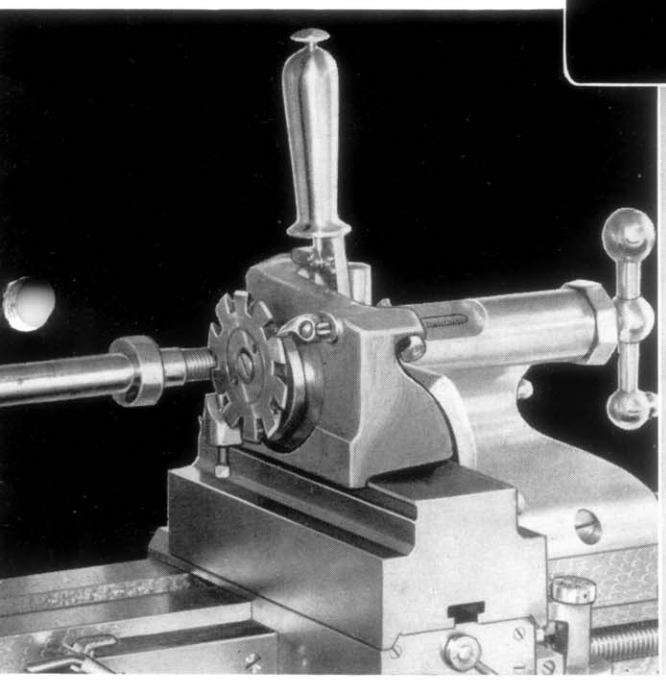


Fig. 16

The thread tool takes the place of single point tools generally used for cutting external threads on engine lathes. Base mounts on raising block on lathe saddle in place of slide rest. It carries a 10 tooth high speed steel cutter with means for indexing to present each of the teeth successively to the work and has fine screw adjustment to control final depth of cut. First tooth is widely topped and cuts only a very shallow groove. Second tooth cuts a little deeper but no wider and each succeeding tooth progressively deepens the groove. The tenth tooth takes a very light finishing cut to exact form and smooth finish. A separate cutter is required for each form and pitch of thread. Range of threads, six pitch or finer. Diameter 4″ max.

INDEXING ATTACHMENT AND SLOTTING ATTACHMENT

The indexing attachment divides work held in headstock spindle. Bracket mounts on headstock and carries finger which engages index plate; standard divisions 45, 56, 60, 64, 72, 80, 84 or 100.

The slotting attachment is used for cutting keyways, slots and holes of odd contour. Tool holder has vertical screw adjustment and secondary adjustment for cutting rake.

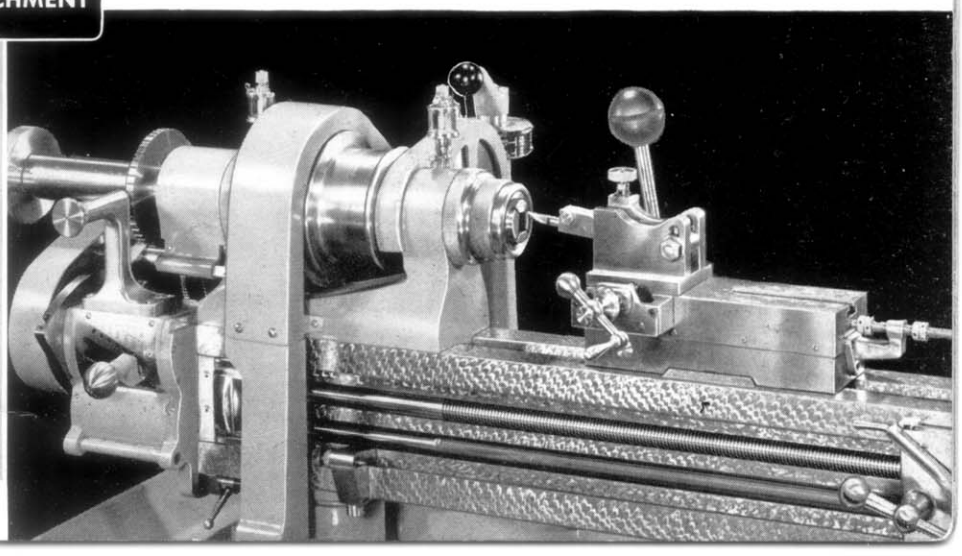
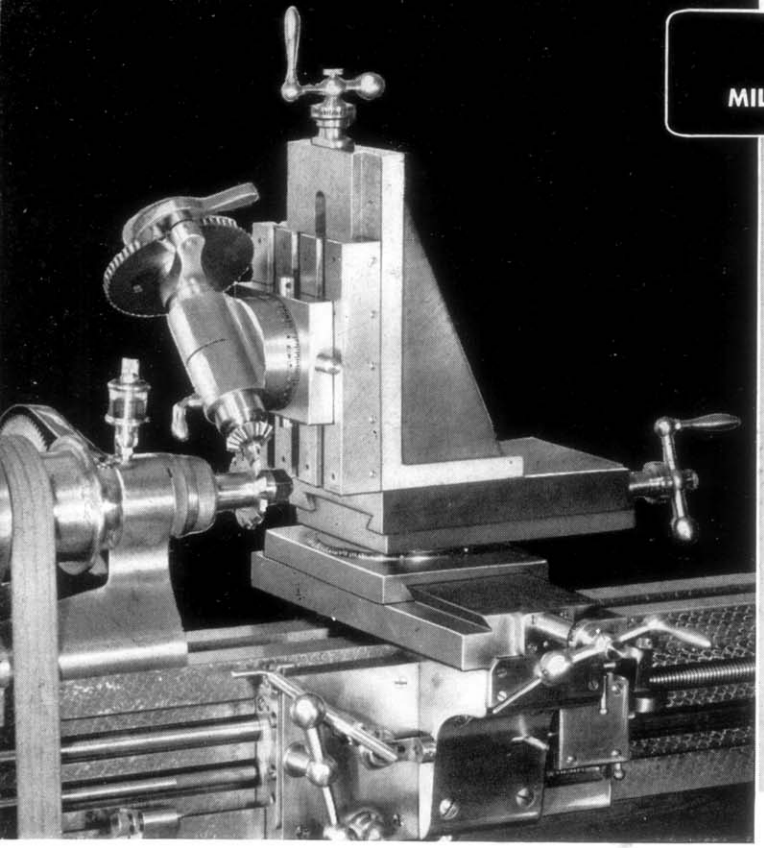


Fig. 17



CARRIAGE MILLING ATTACHMENT

The carriage milling attachment mounts on saddle in place of slide rest. Longitudinal power feed is by carriage travel. Power cross feed is from cross feed gear in carriage. Universal movements in three directions are by three feed screws and ball handles fitted with adjustable dials graduated to .001″. Range: 5½″ vertical, 2⅜″ longitudinal and 8½″ cross. Base is fitted with transverse slide carrying graduated swivel, on which mounts upper slide carrying vertical-faced knee. Swivel is locked by eccentric binder. Knee is fitted with a vertically-fed slide having three tee slots, for positioning top swivel in which mounts the spindle with index plate on rear. Top swivel swings to any position and carries spindle for 5C collets max. 1″ diameter.

Fig. 18

DOUBLE TOOL CROSS SLIDE

The double tool cross slide mounts two tools for forming plain or irregular shapes and for rapid cutting off. Base mounts on beveled shoe scraped to alignment with bed. Cross slide is traversed by rack and pinion max. 3½″. Circular forming tool block at front is mounted in a gibbed dovetail affording 1¼″ longitudinal adjustment. Cutting-off block at rear is clamped in slot affording transverse adjustment of 2″ and carries $^{3}/_{32}$″ x ½″ blade. Swing over cross slide 3⅛″. Adjustable stop at rear limits cross slide travel for duplication of sizes.

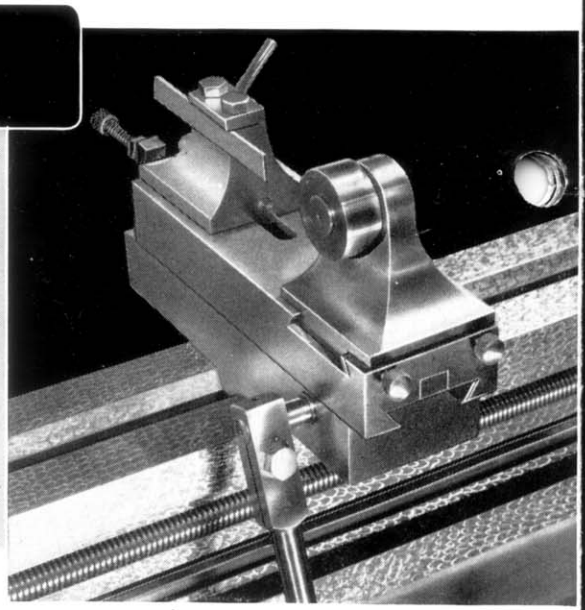
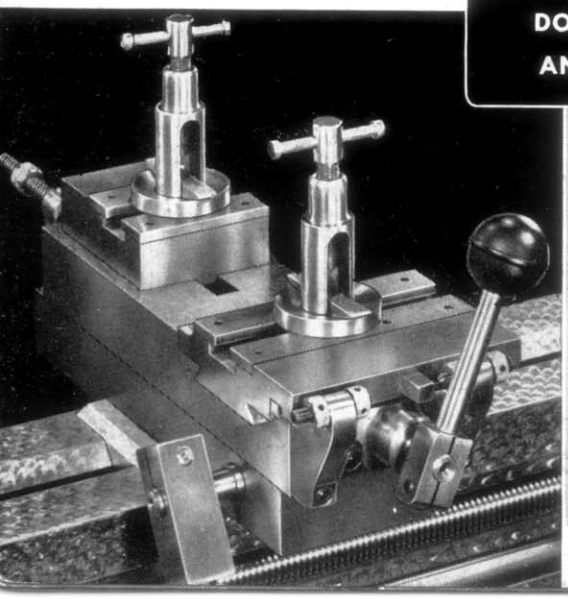


Fig. 19

DOUBLE TOOL CROSS AND TURNING SLIDE



The double tool cross and turning slide is used for straight turning to close limits and for rapid cutting off. Base mounts on beveled shoe scraped to alignment with bed. Cross slide is traversed by rack and pinion max. 2¼″. Rear tool block mounts in slot affording transverse adjustment of 2″. Front tool slide has longitudinal movement by rack and pinion max. 1½″. A single stop at rear of base and a two-way stop at front control all tool movements for duplication of sizes.

Either double tool cross slide may be used with turret attachment or singly.

Fig. 20

AUTOMATIC INDEXING TURRET

The "608" equipped with automatic indexing turret, double tool cross slide or double tool cross and turning slide and lever chuck closer is an efficient high precision hand screw machine. Turret head has six stations for holding tools with $\frac{3}{4}''$ diameter shanks and is carried on slide dovetailed and gibbed to base which mounts in any position on lathe bed. The turret automatically indexes with the slide movement and has six independently adjustable stops which are geared to and index with the turret head.

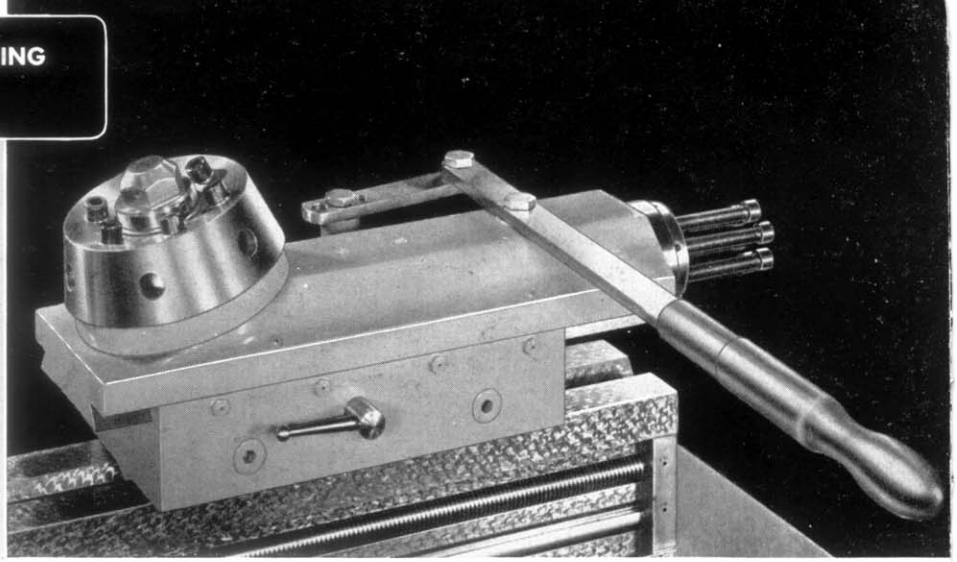
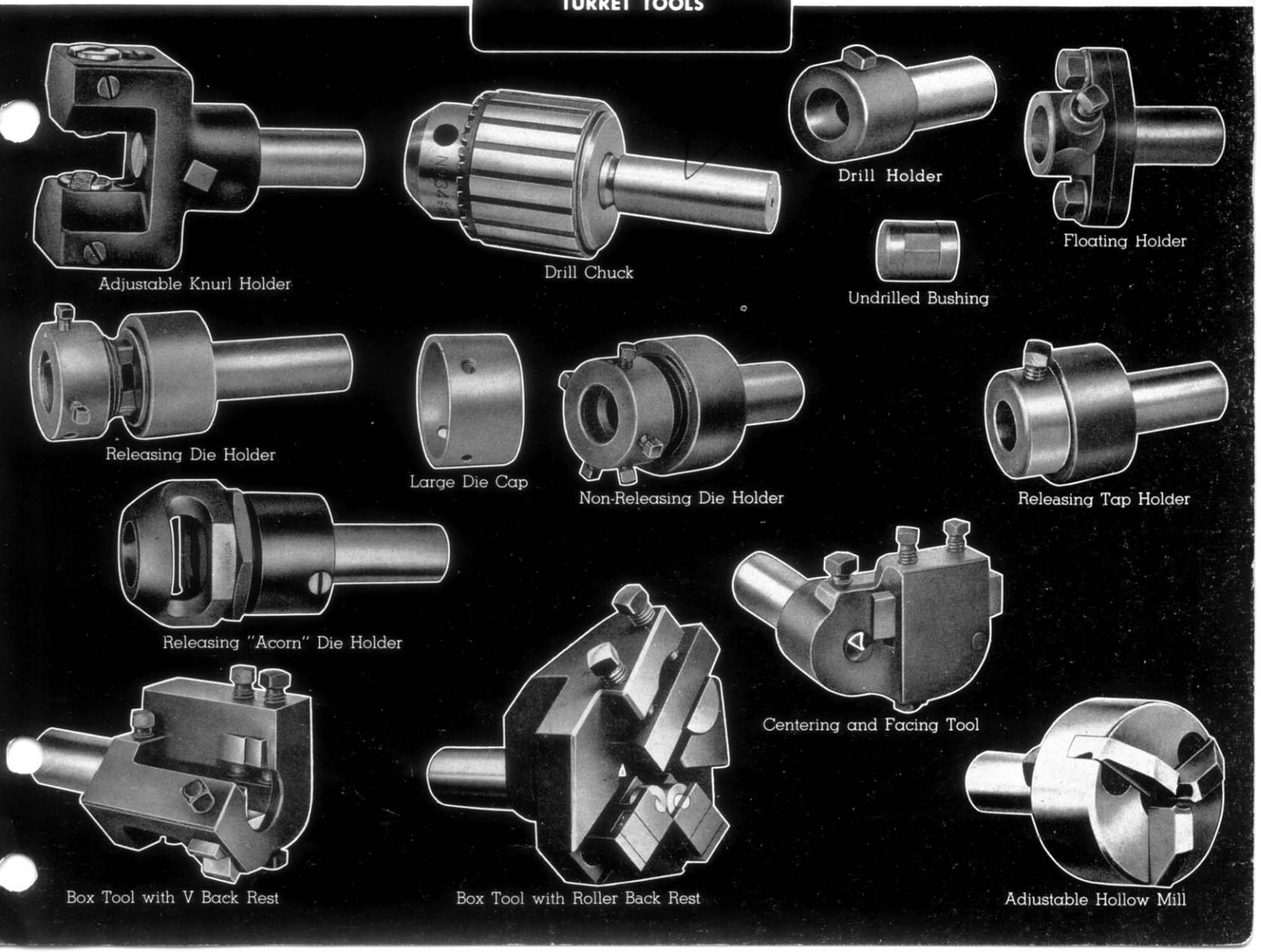


Fig. 21

TURRET TOOLS

Fig. 22



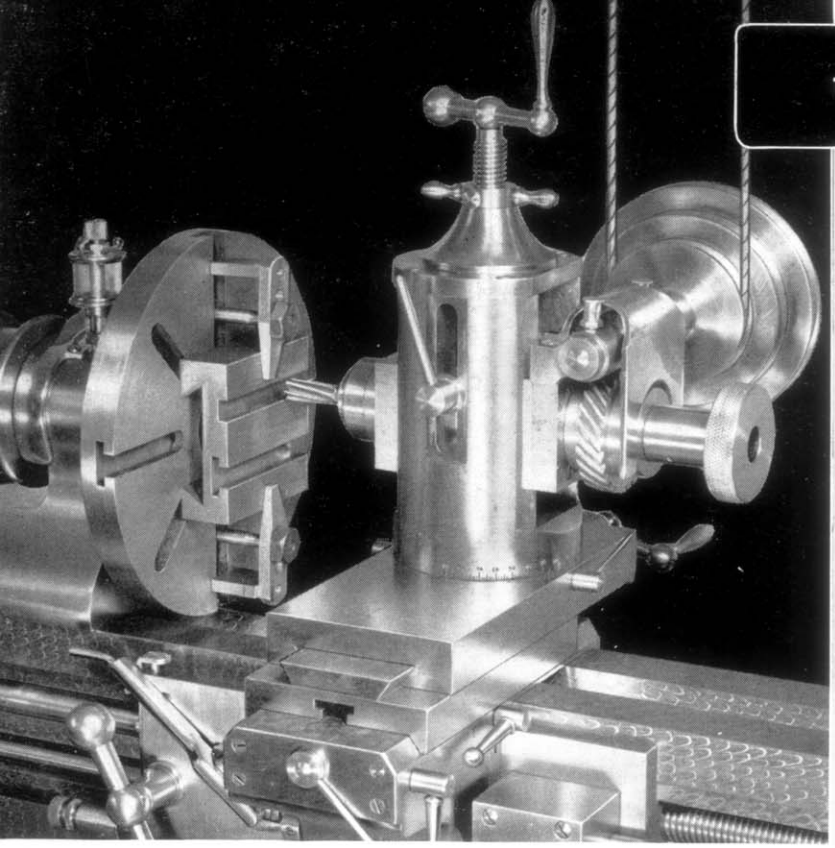


Fig. 23

TRAVERSE MILLER

The traverse miller is used for work carried on face plate or lathe centers. It mounts on carriage saddle in place of slide rest. Longitudinal feed is by feed rod or lead screw. Transverse movement is by cross feed screw, dial graduated to .001″. Column carrying cutter spindle swivels to any angle. Base is graduated 90° each side of center and locked by two binders. An adjustable set collar permits feeding to definite depth on duplicate work. Handle on side of column binds spindle slide in any vertical position. By use of Rivett 4N.S. collets, milling cutters or other tools with shanks up to $\frac{5}{8}$″ dia. are held in spindle. Arbors for cutters with holes max. 1″ dia. are carried in stock. Drive is by round belt from auxiliary motor overhead drive, Fig. 33, or auxiliary countershaft overhead drive, Fig. 34.

TRAVERSE MILLER THREAD MILLING ATTACHMENT

The thread milling attachment is used with the traverse miller for machining screws, worms and hobs through a wide range of pitches and thread forms. Drive for lathe spindle and lead screw, through change gearing, at proper relative speeds to mill desired pitches is from speed-reducing pedestal type countershaft. This countershaft is driven from horizontal safety drive or individual motor. The attachment is mounted on the traverse miller. The cutter is set by a dial graduated in degrees to correspond with the helix angle of the thread to be milled. Cutter is driven by traverse miller spindle through spiral gears to cutter arbor. The arbor takes cutters having $\frac{3}{4}$″ hole. A wide range of suitable cutter speeds is available.

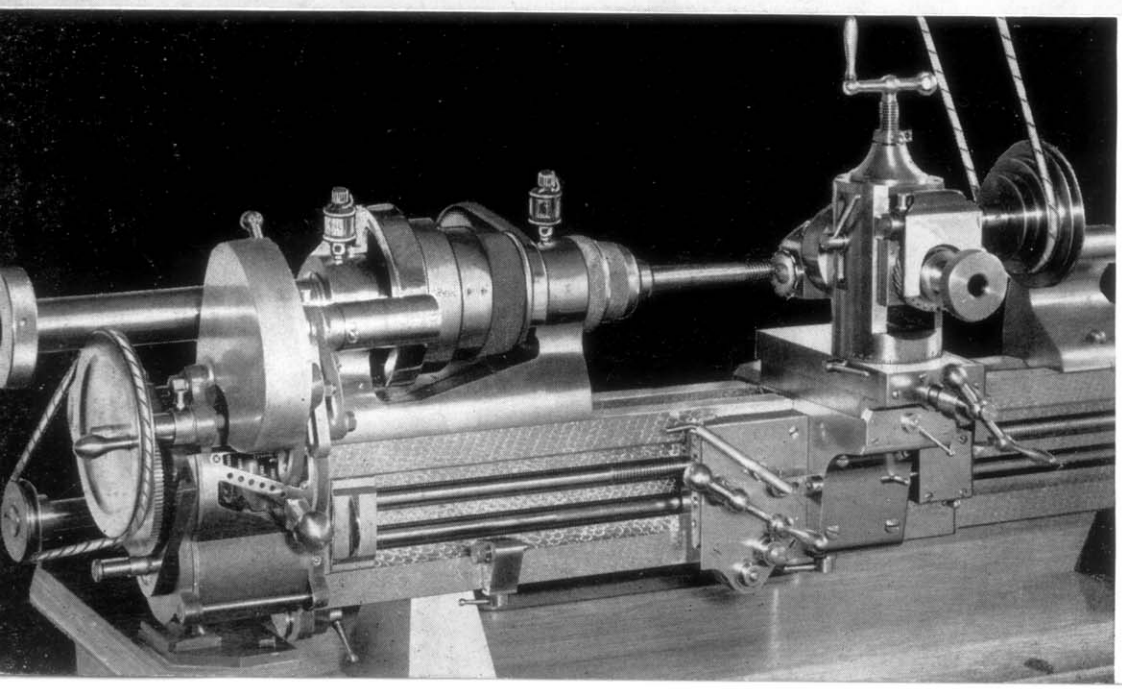


Fig. 24

TRAVERSE MILLER SPIRAL MILLING ATTACHMENT

The spiral attachment is used with the traverse miller for cutting flutes and other spiral grooves and slots. A dividing head with an adjustable indexing crank is interposed in the transmission. Two perforated index plates provide for cutting desired number of teeth or flutes. The dividing head and lead screw are driven through quick change gear box with auxiliary drive as described for thread milling attachment.

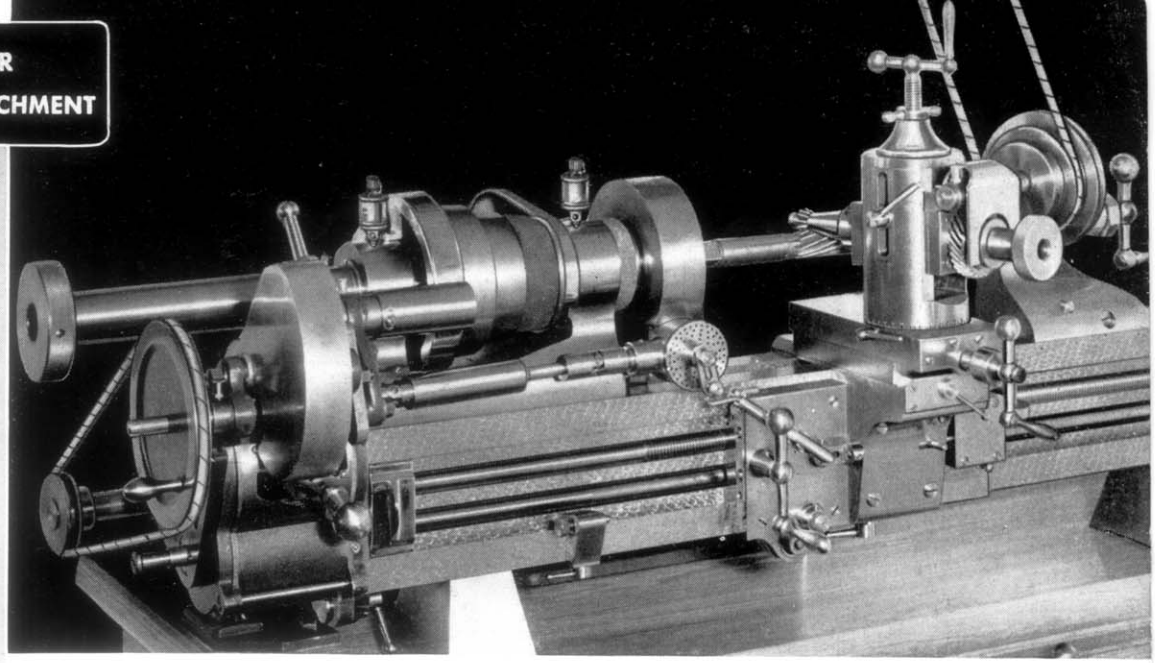


Fig. 25

RELIEVING ATTACHMENT

The relieving attachment is used to relieve, or back-off, right or left-hand taps, milling cutters, counterbores and similar tools having up to 30 straight or spiral flutes. It mounts on carriage saddle in place of slide rest. Tool slide swivels to any angle. Dial is graduated 90° each side of center. Tool slide throw is controlled by cam with adjustment up to $\frac{1}{16}''$ max. The tool block takes tools or tool holders with $\frac{1}{2}''$ square shanks. Feed screw and telescopic shaft to ram are driven through quick change gear box from same auxiliary drive as described for thread milling and spiral milling attachments.

A crank handle on the driven pulley is provided for setting up work.

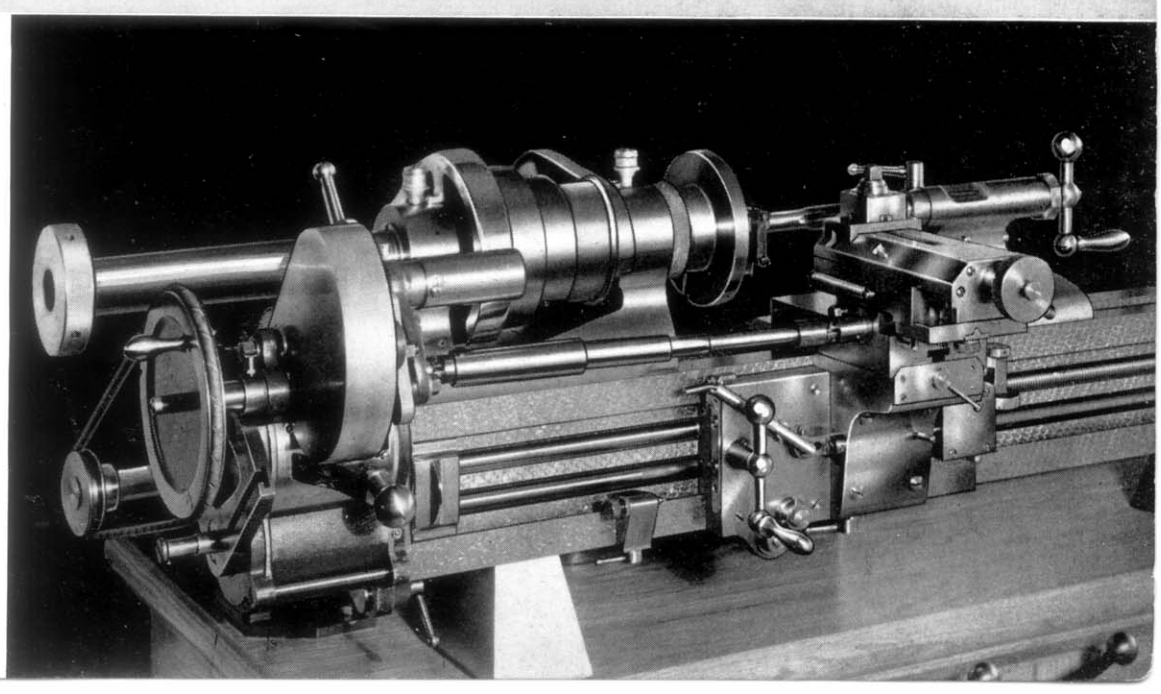


Fig. 26

ATTACHMENTS

Hinged steady rest, mounts on lathe bed, has three brass jaws with screw adjustment and lock screws, max. capacity 4″ diameter.

Plain tee rest, mounts on saddle in place of slide rest and carries standard 3″ tee. Base also used for L REST, 6″ TEE, TRIANGLE REST and SAW TABLE.

Hinged tee rest, mounts on saddle and is same as plain tee rest except upright swings away from work when not in use.

Follower rest attaches to base of slide rest. Used to support work held on centers. Brass jaws have adjustable capacity to 3″ diameter.

Angle iron, used on slide rest and universal milling attachment. Has tee-slots and vee-grooves for round work. Length 4¼″, width 3¼″, height 3″.

Tailstock knurling attachment for production diamond knurling, work held in collet. Cross slide carrying knurls is controlled by feed screw. Capacity 3/16″ to 5/8″ diameter.

Tailstock turret attachment, mounts in tailstock spindle by tapered shank, efficient on small parts. The head is rotated by hand and locked in position by index pin.

Slotting and milling fixture mounts on saddle. Vee block, adjustable for height, carries square holder for collets. Work, held in collet, advances against saw or cutter on arbor held in lathe spindle. Depth of cut, max. 1″, controlled by adjustable stop nuts.

Live center, ball bearing type, for tailstock.

Blank center, of annealed tool steel, 1″ diameter by 1⅜″ long. May be turned to any desired form.

Spur center, used for wood turning.

Half male center, has hard head, slabbed to provide clearance for turning tools when facing ends of work or external grinding small diameters.

Solid vee center, has soft head 1 1/16″ diameter and groove with 90° included angle.

Male center, has head with 60° included angle. Furnished hard for tailstock and soft for headstock.

Revolvable vee center, has soft head which turns freely on shank.

Female center, has hard head with 60° included angle and center hole with 60° included internal angle.

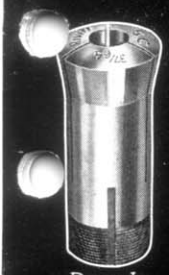
Large male center, has 1½″ diameter hard head with 60° included angle.

Adjustable off-center, has slide with max. ¼″ screw adjustment carrying ½″ diameter hard male and female removable centers.

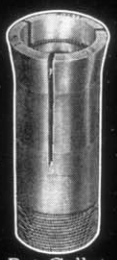
Center and center chuck, consists of soft male center with taper fit in center chuck. Solid center chuck fits headstock spindle and carries all forms of centers.

Fig. 27

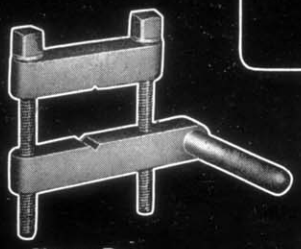
ATTACHMENTS



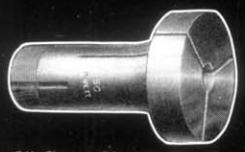
Draw-In Collet



Pot Collet

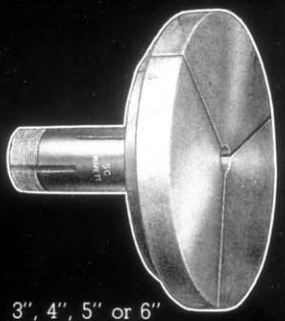


Clamp Dog

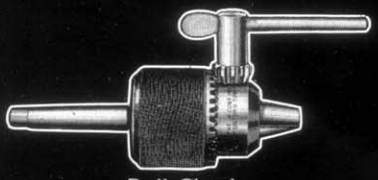


2" Step Chuck Blank

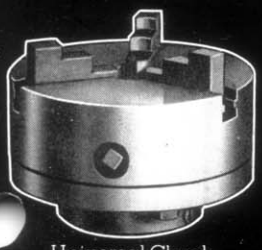
Closing Ring



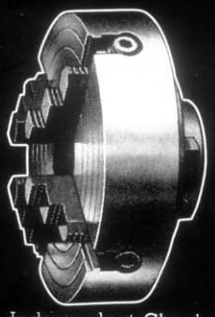
3", 4", 5" or 6" Step Chuck Blank



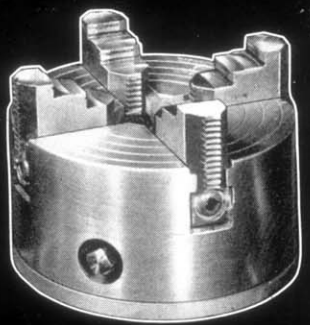
Drill Chuck



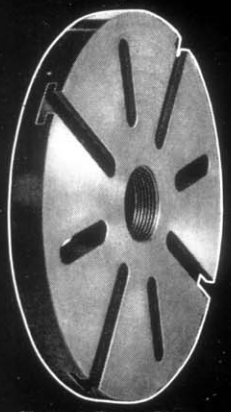
Universal Chuck



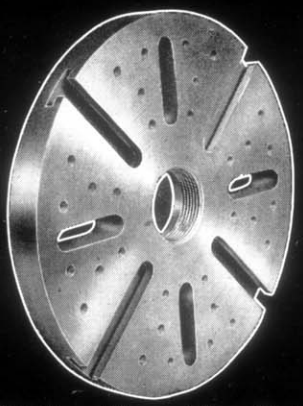
Independent Chuck



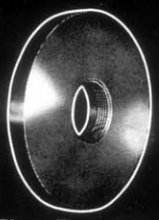
Combination Chuck



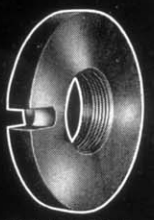
Slotted Face Plate



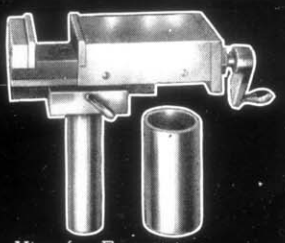
Slotted and Tapped Face Plate



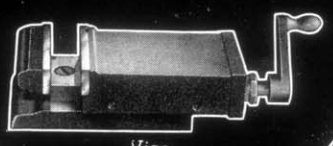
Plain Face Plate



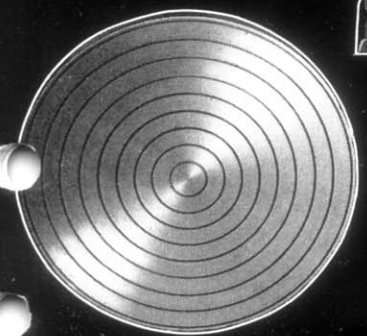
Driving Plate



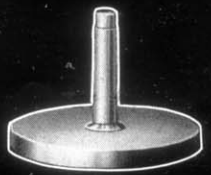
Vise for Eccentric Tool Holder Attachment



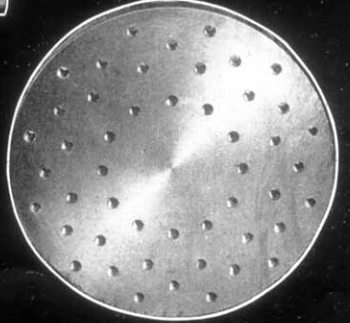
Vise



Emery Face Plate



Drill Plate



Tapped Face Plate

Draw-in collet, mounts directly in spindle mouth, is split, spring-tempered and ground.

Pot collet is split, spring-tempered and ground. Max. diameter and depth of hole limited by head dimensions.

Clamp dog, $\frac{3}{4}$" capacity, used for driving work held between centers.

2" step chuck blank, is soft, split, with $\frac{9}{16}$" dia. hole to be bored to desired diameters. Closes by drawing into spindle mouth..

3", 4", 5" or 6" step chuck blank, requires closing ring. It is soft, split, with $\frac{9}{16}$" dia. hole to be bored to desired diameters.

Closing ring, screws on threaded spindle nose and is furnished in two sizes, one for 3" and 4" step chucks and one for 5" and 6" step chucks.

Drill chuck, with taper shank for tailstock spindle or headstock center chuck or straight shank for collet or turret. Capacities: $\frac{1}{4}$", $\frac{3}{8}$" and $\frac{1}{2}$" diameter.

Universal chuck, 3-jaw geared scroll with inside and outside jaws. Mounts on threaded spindle nose. Furnished in 5" size.

Independent chuck, 4 reversible jaws. Mounts on threaded spindle nose. Furnished in 6" size.

Combination chuck, 4-jaw geared scroll reversible type, independent and universal movement. Mounts on threaded spindle nose. Furnished in 6" size.

Slotted face plate, 8" dia., has four plain and four tee slots.

Slotted and tapped face plate, 8" dia., has four plain and four tee slots and 32 holes tapped $\frac{1}{4}$"-20.

Plain face plate, $4\frac{1}{4}$" or $5\frac{1}{8}$" dia.

Driving plate, $3\frac{3}{4}$" dia., $\frac{3}{8}$" wide slot for lathe dogs.

Vise, for slide rest, mounts on top slide. Hardened steel jaws $1\frac{3}{4}$" maximum opening. Also used on angle iron and milling attachment.

Vise, for slide rest eccentric tool holder attachment. Also, with 1" collet, used in lathe spindle and milling attachment.

Emery face plate, 7" dia., has circular scoring for emery discs.

Drill plate, 2", 3", 4" and 5" dias. Fits tailstock spindle and headstock center chuck.

Tapped face plate, 7" dia., forty-nine holes tapped $\frac{1}{4}$"-20.

Fig. 28

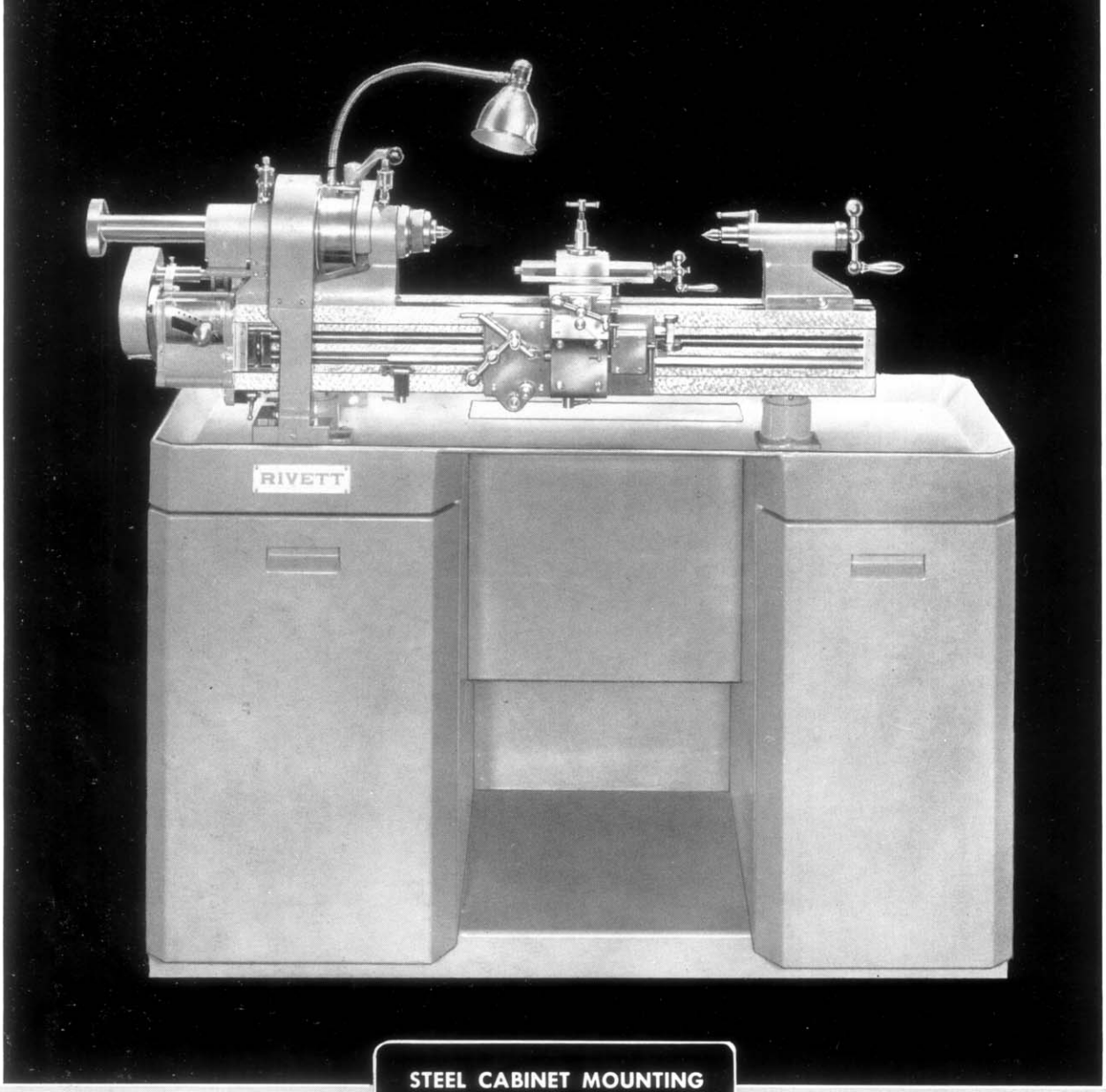
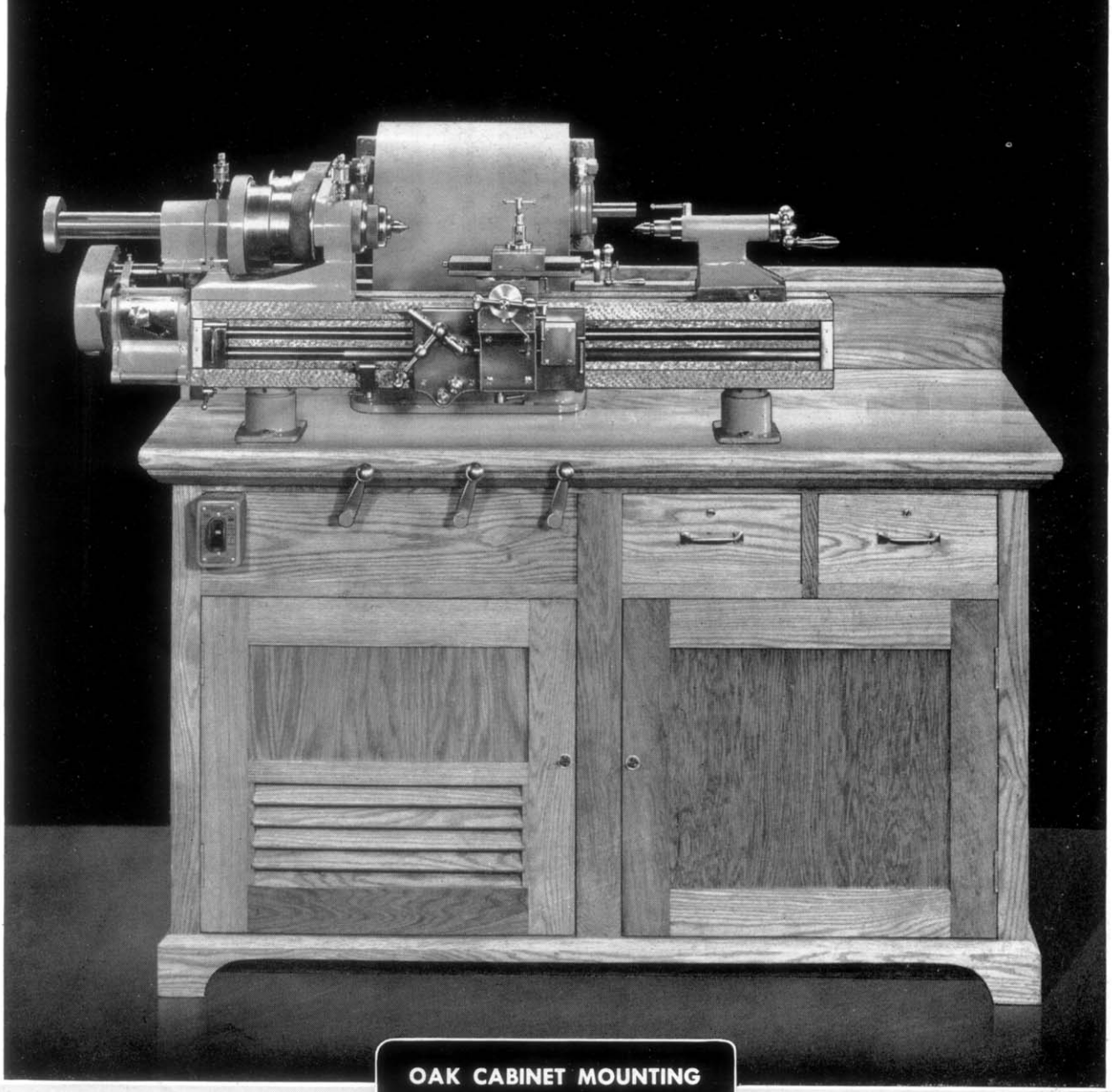


Fig. 29

STEEL CABINET MOUNTING MOTOR JACKSHAFT DRIVE

The knee-hole cabinet occupies the minimum floor space to provide adequate mounting for the lathe and drive. The welded steel plate construction constitutes a rigid and durable support. The drive compartment which houses the jackshaft assembly and motor on sliding base, directly bolted to foundation plate to isolate motor vibration from lathe, has ample louvres for ventilation. The door of this compartment is of sufficient height and width to allow removal of the entire drive, if necessary for repair — an important feature when cabinet is located against wall or back to back with another unit. The door at the left end affords access for inspection and service to a shallow compartment which contains magnetic starter and disconnect line switch. Right hand compartment provides storage for chucks on fitted shelves, collets on a sliding tray and other attachments and tooling below. Two holes at each end of cabinet allow use of lifting hooks. Pedestal at rear of headstock carries motor control lever, which operates drum switch interlocked with magnetic controller, and adjustable lamp. In conformity with the modern trend in design of machine tools the knee-hole cabinet permits an operator to sit in a restful position when performing simple operations.

The motor jackshaft drive for the 608 semi-enclosed vee sheave headstock lathe provides twelve spindle speeds 25 to 1500 r.p.m. using a two-speed motor. Control of motor is fully magnetic. All revolving parts are dynamically balanced and run on ball bearings. Jack screw affords height adjustment for spindle belt tension. Toggle releases tension of driving belt when shifting same on 3-step sheave. Motor slide has screw adjustment.

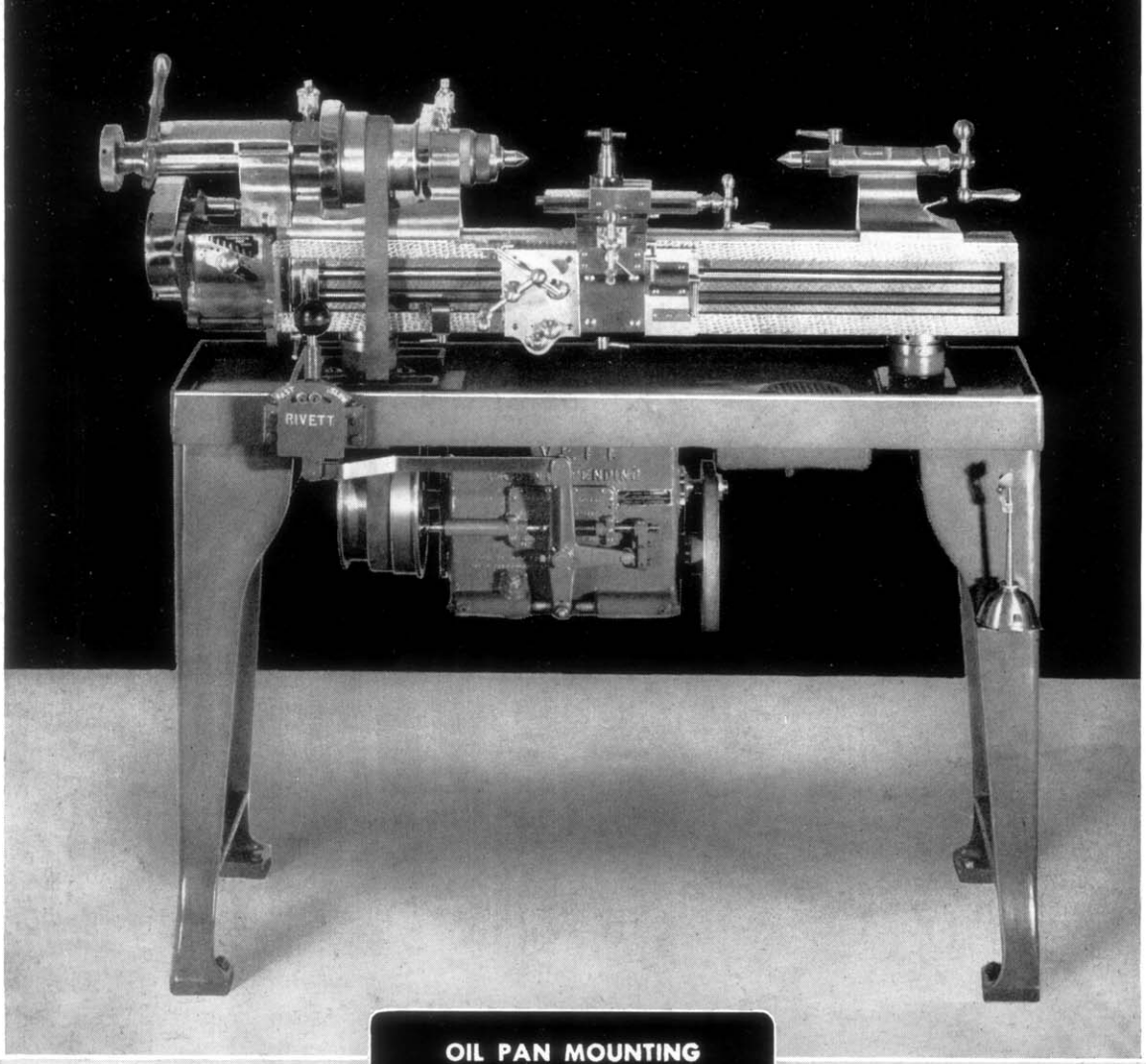


OAK CABINET MOUNTING HORIZONTAL SAFETY DRIVE

Fig. 30

The oak cabinet, substantially built of solid quartered oak with 5-ply laminated top, 57″ x 24″ and 34″ high affords not only an ample mount for "608" but ideal space, under lock and key, for storage of its many valuable attachments. One drawer contains a sliding board for a full set of collets. In the other, small items and tools may be lodged within reach of the operator. Shelves and floor of the compartment serve to accommodate accessories of every sort. With horizontal safety drive or speed box motor drive (see Fig. 31) the cabinet is a complete unit, ready to locate as received and only requiring connection of motor leads.

The horizontal safety drive for the 608 cone headstock lathe mounts in rear of lathe on cabinet or bench and provides twelve spindle speeds 45 to 1300 r.p.m. The standard motor, 1750 r.p.m., is located in motor compartment of cabinet or on motor plank of bench and is fitted with a single sheave and vee belt driving underneath jackshaft which is mounted on back plank of cabinet or bench. Motor runs continuously and reversal is by shift of crossed belt. Underneath jackshaft carries pulleys for three vertical belts. The opening for these belts is surrounded by a guard which pivotally supports the countershaft base. By means of a stud and nut at the front of the guard the countershaft base is swung on its trunnions. This single movement brings the three vertical belts and the horizontal headstock belt into proper initial tension and is later used to tighten the belts to compensate for stretch in service. After adjustment is made, base is locked to guard by two bolts. A removable sheet metal cover eliminates all danger.



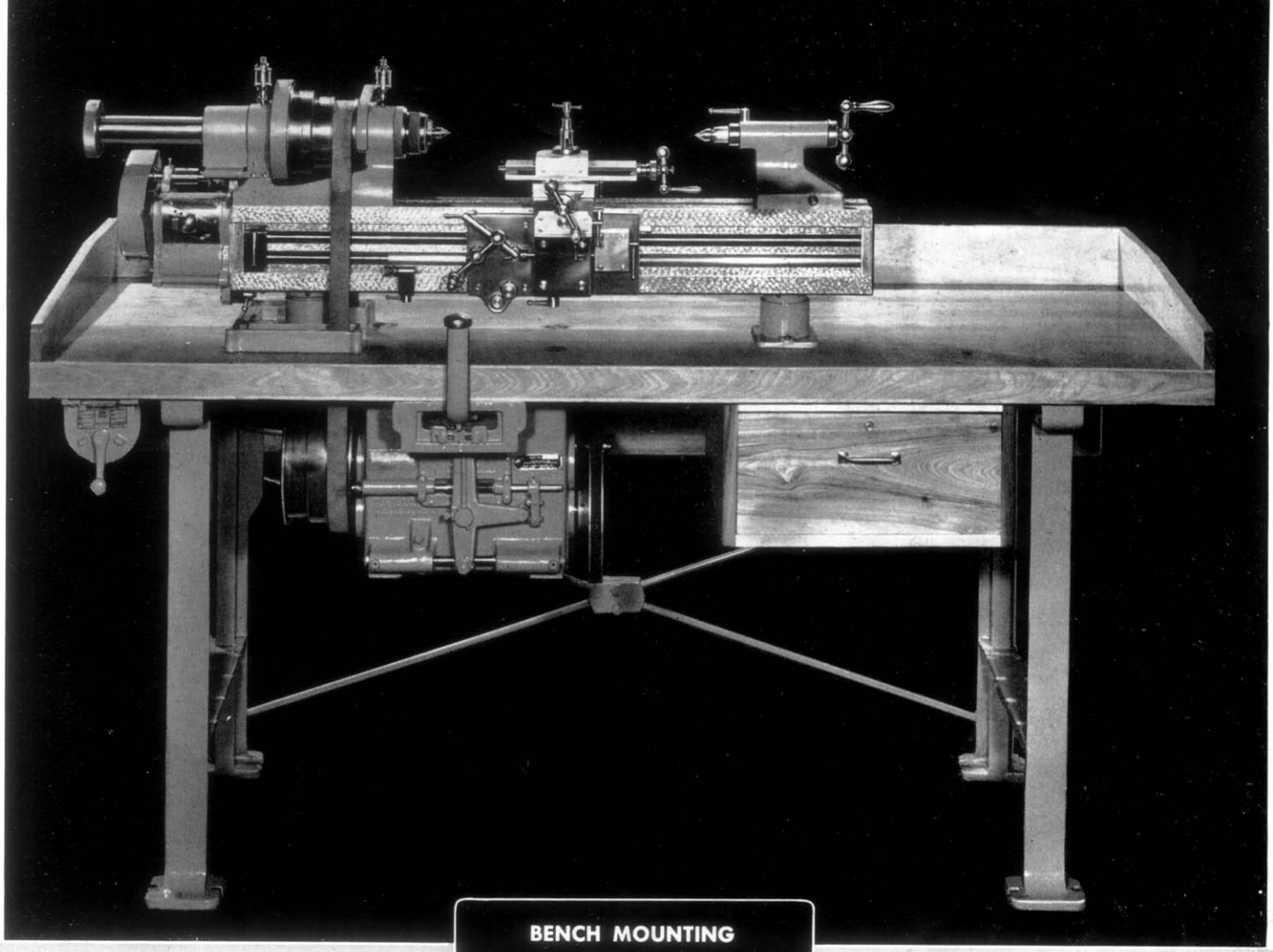
OIL PAN MOUNTING
SPEED BOX DRIVE

Fig. 31

The oil pan mounting consists of pan, with oil sump, strainer and curbed belt opening of U form, on sturdy legs. To replace endless driving belt it is merely necessary to pass its loop through this U-opening. The oil pan requires floor space approximately 50″ x 20″. If lathe is to be used with turret as a screw machine requiring cutting oil, the coolant pump and tank, Fig.35, may be attached to back of oil pan, mounted on a plank between the legs, or on the floor. Piping with flexible nozzle and shut-off cock is located at rear of headstock to direct coolant over cutting tool.

The speed box motor drive for the 608 cone headstock lathe is a self-contained unit affording twelve spindle speeds 45 to 1300 r.p.m. It consists of a constant speed motor, reduction gearing and cone pulley suitably designed to produce the required range of lathe spindle speeds. Motor is carried on a swinging plate pivoted to rear of speed box with screw adjustment for maintaining tension of vee belt driving lower shaft. Two pairs of helical-cut spur gears of different ratio, constantly in mesh, connect lower and upper shafts. Either pair may be selectively employed by action of a two-way multiple steel disc clutch operated by hand lever. (Latch foot treadles may be furnished in place of hand lever when used with bench or oil pan mounting if specified.) On release of control, spring action throws clutch to neutral and automatically applies a brake to driving cone pulley, instantly stopping lathe spindle.

The speed box transmission is quiet and free from vibration. Gearing is of modern design and mounted on large diameter heat-treated alloy steel shafts running in tapered roller bearings. All moving parts are dynamically balanced. All interior parts are splash lubricated. A cover plate, easily removed, gives access to the clutch for adjustment.



BENCH MOUNTING
SPEED BOX DRIVE

Fig. 32

The unit bench assembly consists of five-ply laminated maple top 72″ x 26″ x 2¼″ with back and end boards and a drawer having collet board, tool tray, lock and key. Heavy cast iron legs are lagged to the top, at once affording support and assurance against possible distortion of bench surface. Steel tie rods give rigidity to the unit. The woodwork is finished in shellac and wax and the legs painted machine tool gray.

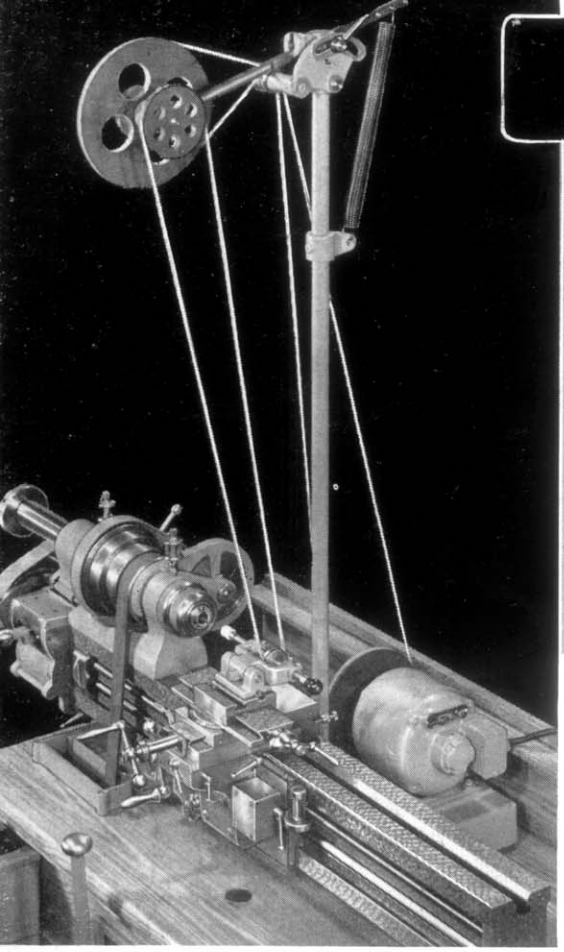
The speed box motor drive, as illustrated, bolts to underside of bench and is usually controlled by hand lever. Latch foot treadles are also available and will be furnished when specified.

The horizontal safety drive, Fig. 30, may also be used for driving lathe when mounted on bench, a motor plank then being bolted to leg cross-bars to carry motor. The jackshaft mounts on back plank. Hand belt shifters are usually used to operate this drive, but latch foot treadles are furnished when specified.

When lathe is driven by speed box motor drive, the auxiliary motor overhead attachment, Fig. 33, carried on bench at rear of lathe is used to drive grinding attachments or traverse miller. If lathe is run by horizontal safety drive, above attachments are operated from the auxiliary countershaft overhead drive, Fig. 34.

Although not a standard assembly, bench may also be furnished with motor jackshaft drive to run 608 lathe equipped with semi-enclosed vee-sheave headstock.

Bench assembly without drive is available if countershaft on wall, belted to overhead line shaft, is planned.

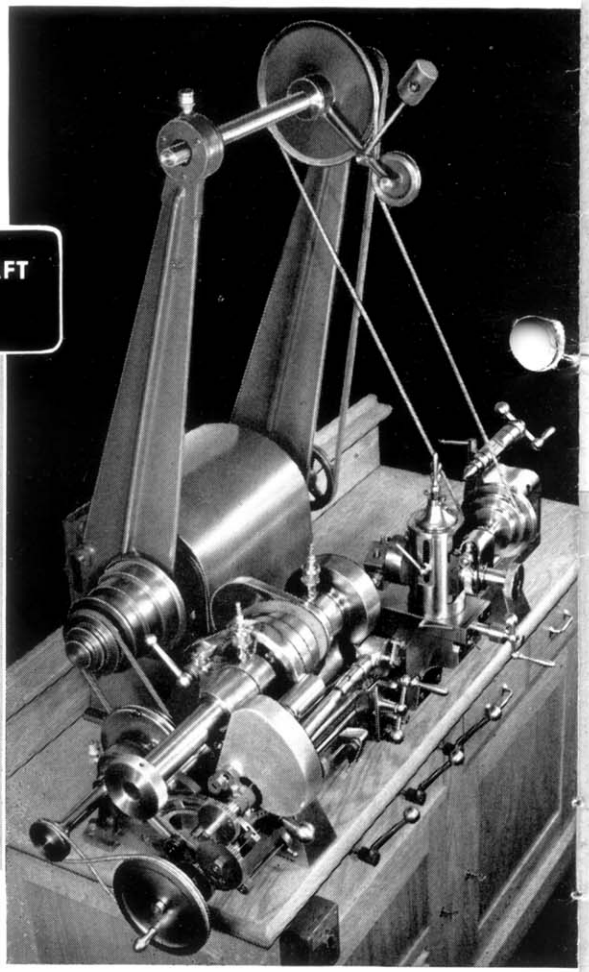


AUXILIARY MOTOR OVERHEAD DRIVE

When 608 lathe is powered by speed box motor drive or motor jackshaft drive, it is necessary to furnish an auxiliary motor overhead drive for belt-driven grinding attachments and traverse miller. The attachment consists of a stand with bracket, a ¼ hp, 110–115 or 220–230 volt, single phase, A.C. or D.C. motor, cord, switch and belting.

Motor carries three-step sheave. Countershaft has two-step driven sheave, two-step driving sheave and is equipped with belt adjustment and independent automatic spring tensioning for belt.

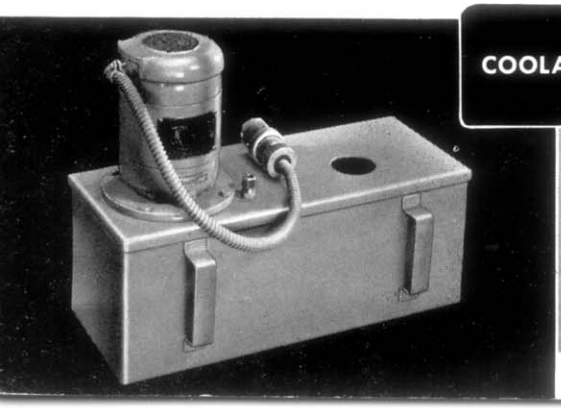
Fig. 33



AUXILIARY COUNTERSHAFT OVERHEAD DRIVE

When lathe is driven by horizontal safety drive, an auxiliary countershaft must be furnished to drive belt-driven grinding attachments and traverse miller. The shaft runs in ball bearings and is driven by vee belt from horizontal countershaft, with interchangeable sheaves overhung, whereby necessary speed ranges may be obtained. A weighted idler pulley swinging about the shaft, tensions the round belt which drives the attachment. The driving pulley with its idler may be set in any position on the shaft for alignment.

Fig. 34



COOLANT PUMP AND TANK

A unit motor immersion pump in three-gallon reservoir is available when coolant is required and may be bolted to back of cabinet or oil pan. Metal flexible gooseneck with nozzle and shut-off for coolant supply attaches to upright at rear of headstock.

Fig. 35

GEAR TABLE FOR ENGLISH THREADS

FORMULA FOR SPECIAL SET-UP - $N = \frac{PQSX}{4RU}$

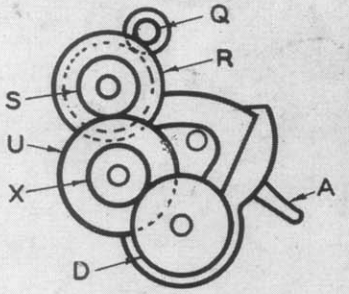
WHERE N = NO OF TEETH IN GEAR D

P = NO OF THDS PER INCH TO BE CUT

AND S-Q-R-U-X = NO OF TEETH IN GEARS S-Q-R-U-X RESPECTIVELY

LEAD SCREW - 8 PITCH

LATHE SCREW CONSTANT = 4



SET-UP FOR SPECIAL SCREW THREADS

THREADS CUT DRIVING THRU REGULAR GEAR BOX

NO OF THREADS PER INCH — POSITION OF LEVER "A" LEFT					RIGHT		STUD DRIVER	STUD DRIVEN	COMP'ND DRIVER	COMP'ND DRIVEN
10	11	12	13	14	16	18	30	60	70	70
20	22	24	26	28	32	36	18	72	70	70
40	44	48	52	56	64	72	30	60	28	112
80	88	96	104	112	128	144	18	72	28	112
SWING GEAR BOX TO ENGAGE 18T.						30	18	60	70	70
GEAR ON STUD WITH 60T SLIDING GEAR						120	18	60	28	112

THREADS CUT WITH SPECIAL SET-UP PER SKETCH - LEVER "A" IN NEUTRAL

THDS PER INCH	STUD Q DRIVER	STUD R DRIVEN	S DRIVER	T CONNECTING	COMP'ND U DRIVEN	COMP'ND X DRIVER	D LEAD SCR.
11½	30	60	48	90			69
15	30	60	48	90			90
17*	30	60	48	90			102*
25*	18	72	48	90			75*
27	18	72	48	90			81
34*	18	72	48	90			102*
38*	18	72	32*	90			76*
42*	18	72	32*	90			84*
50*	18	72	32*	90			100*
54*	18	72	32*	90			108*
60*	18	72	32*		80*	60*	90
68*	18	72	48		90*	45*	102*
76*	18	72	32*		90*	45*	76*
100*	18	72	32*		90*	45*	100*
150*	18	72	48		90*	45*	100*

* SPECIAL THREADS - GEARS NOT FURNISHED WITH STANDARD EQUIPMENT

Fig. 36

GEAR TABLE FOR METRIC THREADS

FORMULA FOR SPECIAL SET-UP - $N = \frac{MRD}{6Q}$

WHERE N = NO. OF TEETH IN GEAR S

M = MILLIMETERS LINEAR PITCH OF THREAD TO BE CUT

Q = NO. OF TEETH IN GEAR Q

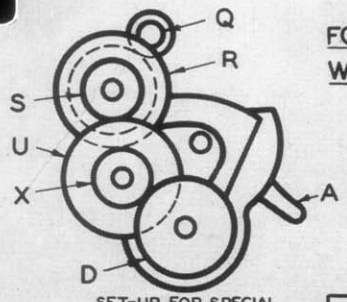
R = NO. OF TEETH IN GEAR R

T = NO. OF TEETH IN CONN. GEAR

D = NO. OF TEETH IN GEAR D

LEAD SCREW = 3M.M. PITCH

LATHE SCREW CONSTANT = 4



SET-UP FOR SPECIAL SCREW THREADS

THREADS CUT DRIVING THRU REGULAR GEAR BOX

MILLIMETERS PITCH — POSITION OF LEVER "A" LEFT						RIGHT	STUD DRIVER	STUD DRIVEN	COMP'ND DRIVER	COMP'ND DRIVEN
4.80	4.36	4.00	3.69	3.43	3.00	2.67	18	72	80	20
2.40	2.18	2.00	1.85	1.71	1.50	1.33	30	60	70	70
1.20	1.09	1.00	0.92	0.85	0.75	0.67	18	72	70	70
0.60	0.55	0.50	0.46	0.43	0.375	0.33	30	60	28	112
0.30	0.27	0.25	0.23	0.21	0.187	0.17	18	72	28	112
SWING GEAR BOX TO ENGAGE 18T.						0.80	18	60	70	70
GEAR ON STUD WITH 60T SLIDING GEAR						0.20	18	60	28	112

THREADS CUT WITH SPECIAL SET-UP PER SKETCH - LEVER "A" IN NEUTRAL

M.M. PITCH	STUD Q DRIVER	STUD R DRIVEN	S DRIVER	T CONNECTING	COMP'ND U DRIVEN	COMP'ND X DRIVER	D LEAD SCR.
0.15	18	72	30		120	40	100
0.35	18	72	42		100	50	90
0.40	18	72	72		120	40	90
0.45	18	72	30	90			100
0.70	18	72	28	90			60
1.25	30	60	30	90			72
1.75	30	60	42	90			72
2.50	30	60	60	90			72
3.50	30	60	42	120			36

Fig. 37

SPECIFICATIONS

HEADSTOCK

Max. dia. round hole in collet	1″
Max. size square hole in collet	$^{23}/_{32}$″
Max. size across flats, hex. hole in collet	$^{7}/_{8}$″
Max. dia. round stock held in jaw chuck, passed through spindle	$1^{1}/_{8}$″
Swing over bed, dia.	$8^{1}/_{2}$″
Height, top of bed to center of spindle	$4^{1}/_{4}$″
Swing over compound swivel of slide rest, dia.	$2^{5}/_{8}$″
Swing over bottom slide of compound slide rest, dia.	$4^{1}/_{4}$″
Swing over carriage, dia	$7^{1}/_{2}$″
Diameters of steps of cone pulley	3″, $3^{1}/_{4}$″, $4^{1}/_{2}$″
Width of belt	$1^{1}/_{4}$″
Threads on spindle nose	Form US
	O.D. $2^{1}/_{16}$″
	Pitch 10
Headstock bearing area on bed	sq. in. 35
Back gear reduction ratio	1 to $6^{2}/_{3}$

GEAR BOX

Range of rod feeds	
Maximum per revolution	0.0220″
Minimum per revolution	0.0028″
Range of threads: thirty-three (including $11^{1}/_{2}$, 15 and 27) see tables Fig. 36-37	10 to 144

CARRIAGE

Bearing area on bed	sq. in. 76

BED

Length of bed	40″
Distance between centers, tailstock flush	$18^{1}/_{4}$″
Distance between centers, tailstock overhung	$21^{1}/_{4}$″
Width	$3^{3}/_{4}$″
Depth	$5^{1}/_{4}$″

TAILSTOCK

Travel of spindle	$3^{1}/_{4}$″
Dia. of spindle	1″
Taper in mouth, Rivett special, approx.	3°
Dia. of hole at mouth	.541″
Scale graduations	3″ x $^{1}/_{16}$″
Dial graduations	.001″
Bearing area on bed	sq. in. 18

SLIDE REST

Travel of top slide	$5^{1}/_{4}$″
Travel of cross slide	$4^{1}/_{2}$″
Tool post slot	$^{1}/_{2}$″ x $^{3}/_{8}$″

SPEED RANGE — TWELVE SPEEDS

Horizontal safety drive	45–1300 rpm
Speed box motor drive	40–1300 rpm
Motor jackshaft drive	25–1500 rpm
Special variable speed drives	furnished if specified

FLOOR DIMENSIONS

Bench	72″ x 16″
Oil Pan	50″ x 20″
Oak Cabinet	57″ x 24″
Steel Cabinet	53″ x 26″

WEIGHTS

Lathe and standard attachments	375 lbs.
Lathe, bench and drive	800 lbs.
Lathe, oil pan and drive	900 lbs.
Lathe, oak cabinet and drive	950 lbs.
Lathe, steel cabinet and drive	1100 lbs.
Domestic boxing, lathe only, add	100 lbs.
Export boxing, lathe only, add	175 lbs.
Domestic boxing lathe, mount and drive, add	250 lbs.
Export boxing lathe, mount and drive, add	350 lbs.

CUBIC FEET, BOXED FOR EXPORT

Lathe and attachments only	16
Lathe, bench and drive	76
Lathe, oil pan and drive	54
Lathe, oak cabinet and drive	75
Lathe, steel cabinet and drive	75

BALL TURNING REST

Max. dia. concave or convex	3″
Dial graduations	.001″

CARRIAGE MILLING ATTACHMENT

Vertical Travel	$5^{1}/_{2}$″
Longitudinal Travel	$2^{3}/_{8}$″
Cross feed	$8^{1}/_{2}$″
Dial graduated	.001″

DOUBLE TOOL CROSS SLIDE

Width of base	3″
Length of base	9″
Travel of cross slide	$3^{1}/_{2}$″
Dia. of circular forming tool	$1^{11}/_{16}$″
Width of circular forming tool	$^{3}/_{4}$″
Size of cutting-off blade	$^{3}/_{32}$″ x $^{1}/_{2}$″
Swing over cross slide	$3^{1}/_{8}$″

DOUBLE TOOL CROSS AND TURNING SLIDE

Width of base	3″
Length of base	9″
Travel of cross slide	$2^{1}/_{4}$″
Travel of front tool slide	$1^{1}/_{2}$″
Swing over cross slide	$3^{1}/_{8}$″

GRINDING ATTACHMENT, BELT DRIVE

Internal — stroke max.	2″
spindle taper	P&W
speeds, with auxiliary countershaft, overhead drive	1100–8000 rpm
speeds, with auxiliary motor overhead drive	6500–11,500 rpm
External — wheel, max.	3″ x $^{1}/_{4}$″ x $^{3}/_{8}$″ hole
speeds, with auxiliary countershaft, overhead drive	850–6000 rpm
speeds, with auxiliary motor overhead drive	4800–7875 rpm

GRINDING ATTACHMENT, MOTOR DRIVE

Internal hole, dia.	$^{1}/_{8}$″ or larger
Collet chuck cap	$^{1}/_{8}$″
Mounted wheels — three furnished	$^{3}/_{4}$″ x $^{1}/_{4}$″
	$^{1}/_{2}$″ x $^{1}/_{4}$″
	$^{1}/_{4}$″ x $^{1}/_{4}$″
External wheels — two furnished	2″ x $^{1}/_{4}$″ x $^{1}/_{4}$″
	$1^{1}/_{4}$″ x $^{1}/_{4}$″ x $^{1}/_{4}$″
Spindle speeds	6900–30,000 rpm

RELIEVING ATTACHMENT

Tool holders, square shank	$^{1}/_{2}$″
No. of flutes, max.	30

SLIDE REST ECCENTRIC TOOL HOLDER ATTACHMENT

Hole dia.	1″
Dia. hole in sleeve	$^{5}/_{8}$″
Dia. hole in split bushing	$^{1}/_{2}$″
High speed steel tools, dia.	$^{1}/_{2}$″
Boring bar, dia.	$^{1}/_{2}$″
Straight cutter holder, dia.	$^{5}/_{8}$″
Angle cutter holder, dia.	$^{5}/_{8}$″

SLOTTING ATTACHMENT

Width of base	3″
Length of base	9″
Width of slide	3″
Length of slide	9″
Travel of slide	$3^{1}/_{2}$″
Traverse feed	2″
Vertical adjustment	$1^{1}/_{8}$″

TAPER ATTACHMENT

Max. angle, degrees	10
Max. angle per foot taper	4″
Max. length	13″

THREAD TOOL

Max. dia. of work	4″
Min. number of threads per inch	6

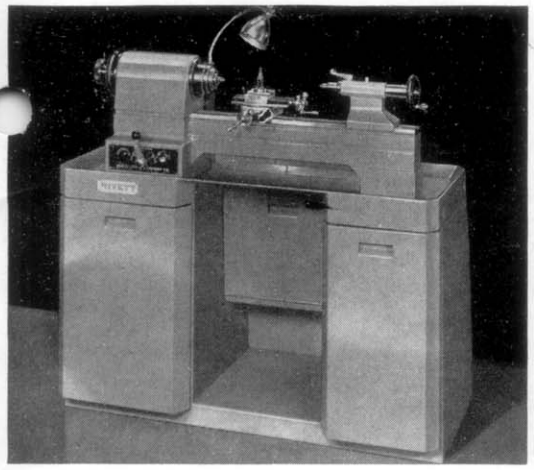
TRAVERSE MILLER

Vertical adjustment	$2^{3}/_{8}$″
Spindle speeds, with auxiliary countershaft overhead drive	150–1750 rpm
Spindle speeds with auxiliary motor overhead drive Thread Milling Attachment	200–1850 rpm
Cutter speeds, with auxiliary countershaft overhead drive	90–1200 rpm
Cutter speeds, with auxiliary motor overhead drive	120–1295 rpm

TURRET

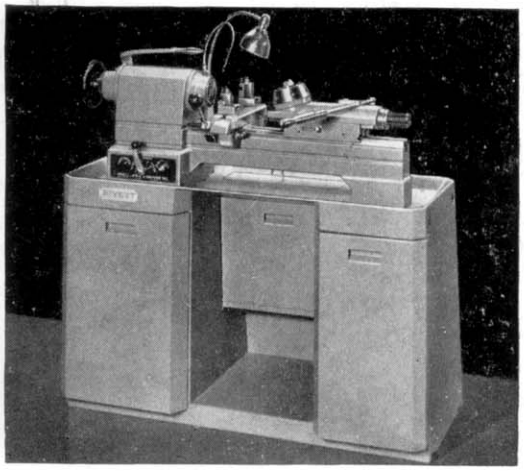
Length of base	11″
Travel of slide after indexing, max.	$41^{1}/_{16}$″
Number of tool holes in head	6
Diameter and depth of tool holes	$^{3}/_{4}$″ x $1^{1}/_{8}$″

OTHER RIVETT PRODUCTS

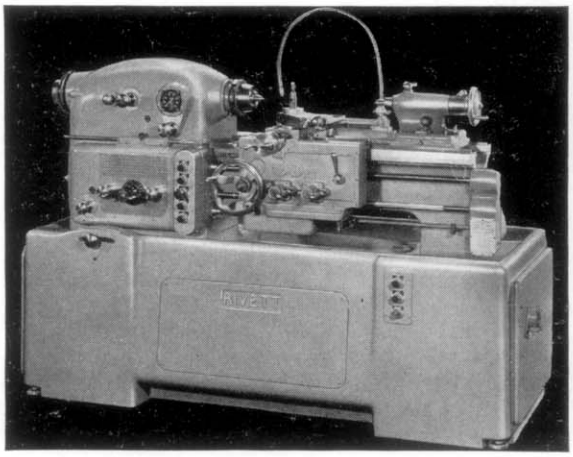


918S Precision Cabinet Lathe — 9″ swing, 1⅛″ collet capacity, 18″ center distance, any spindle speed 100 to 3750 r.p.m.

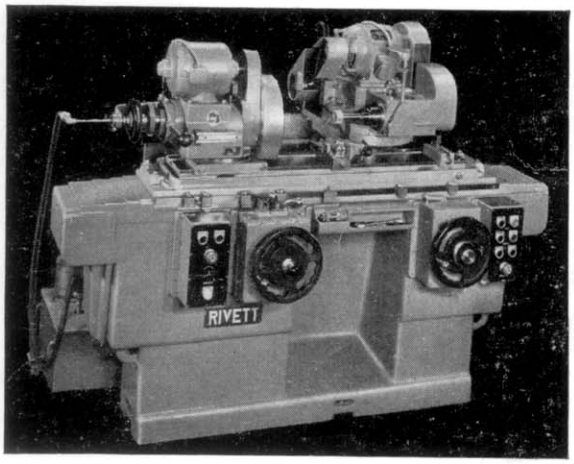
715 Precision Cabinet Lathe — 7″ swing, ¾″ collet capacity, 15″ center distance, spindle speed 200 to 3500 r.p.m.



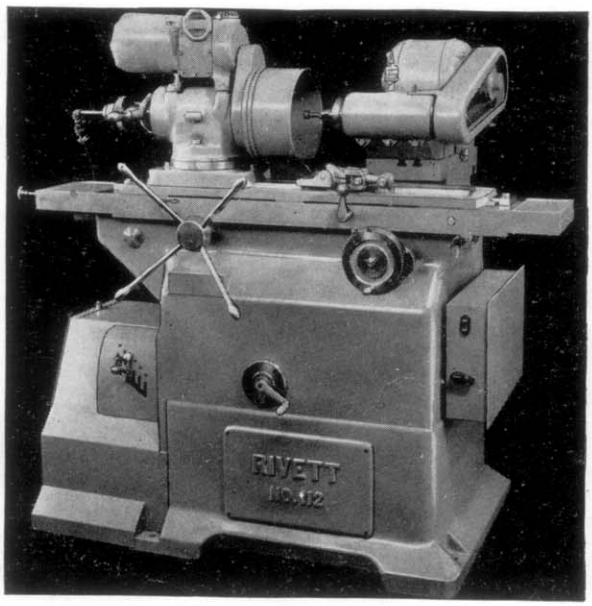
918S Cabinet Turret Lathe — 9″ swing, ⅞″ stationary collet capacity, 1⅛″ draw-in collet capacity, any spindle speed 100 to 3750 r.p.m.



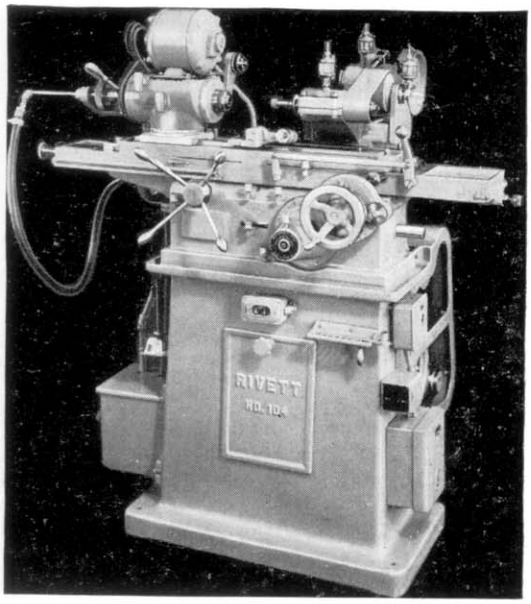
1020S Precision Toolroom Lathe—12½″ swing, 1⅛″ collet capacity, 20″ center distance, 84 thread and 72 feed changes through gear box, any spindle speed 25 to 2500 r.p.m.



1024 Precision Toolroom Grinder — hydraulic table reciprocation ⅜″ to 24″, internal grinding up to approx. 9″ dia., external grinding up to 12″ dia. by 18″ length.



112 Universal Grinder — mechanical table reciprocation ½″ to 8″, internal grinding up to approx. 8″ dia., external grinding up to approx. 8″ dia.



104 Internal-External Grinder — mechanical table reciprocation ½″ to 4″, internal grinding up to approx. 3″ dia., external grinding up to approx. 3″ dia.

RIVETT

LATHE & GRINDER

INCORPORATED