

Standard equipment furnished with 42" "American" Super-Productive Lathes, and included in the base price, is listed herewith.

Large Face Plate with renewable internal gear.

Compound Rest with six-stud Tool Holder.

Timken Bearing Spindle Mounting.

Quick Change Gear Mechanism.

Power Angular Feed to Compound Rest top slide.

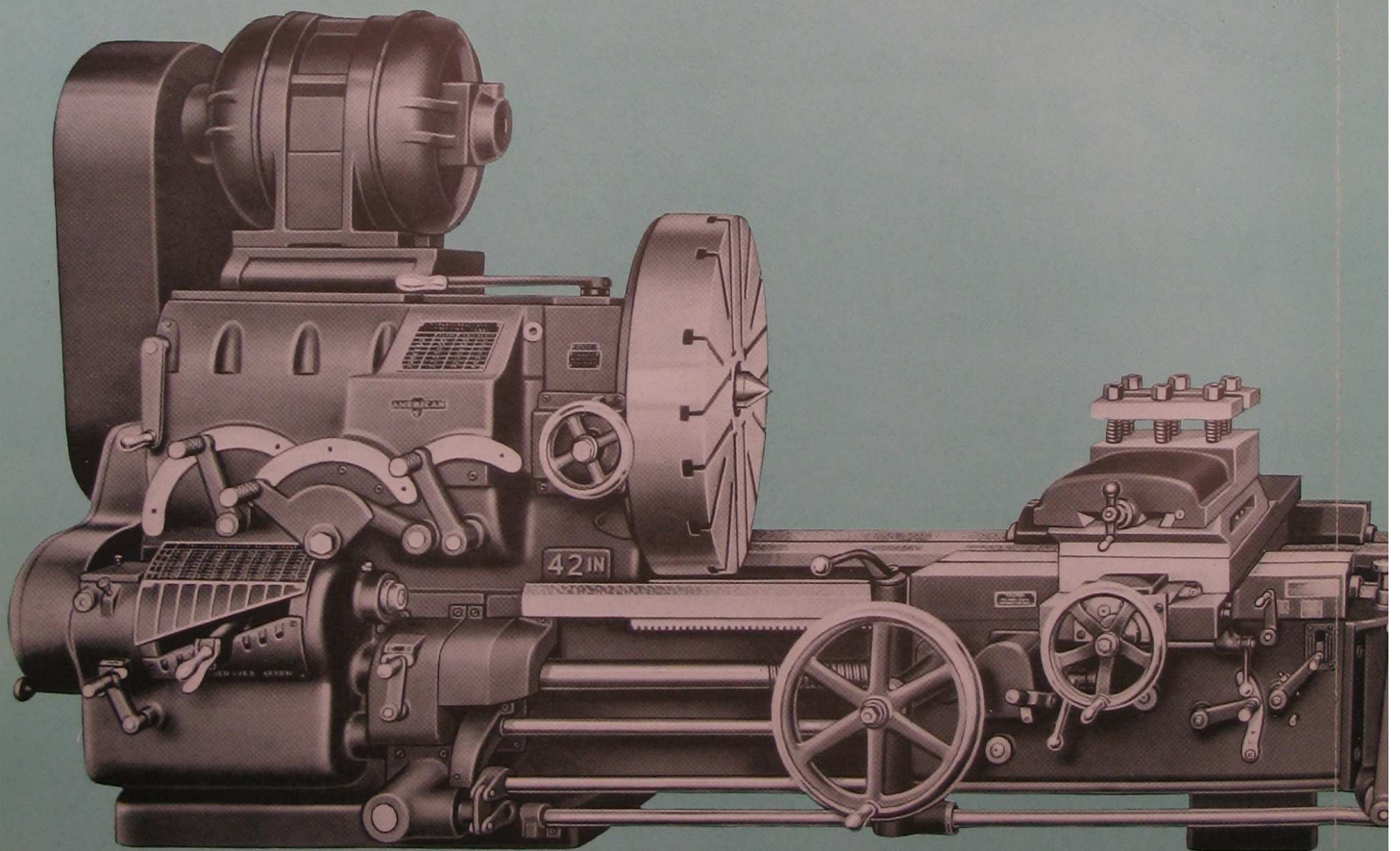
16-inch Capacity, iron body Steady Rest with four bronze tipped jaws.

Mechanical Apron Control.

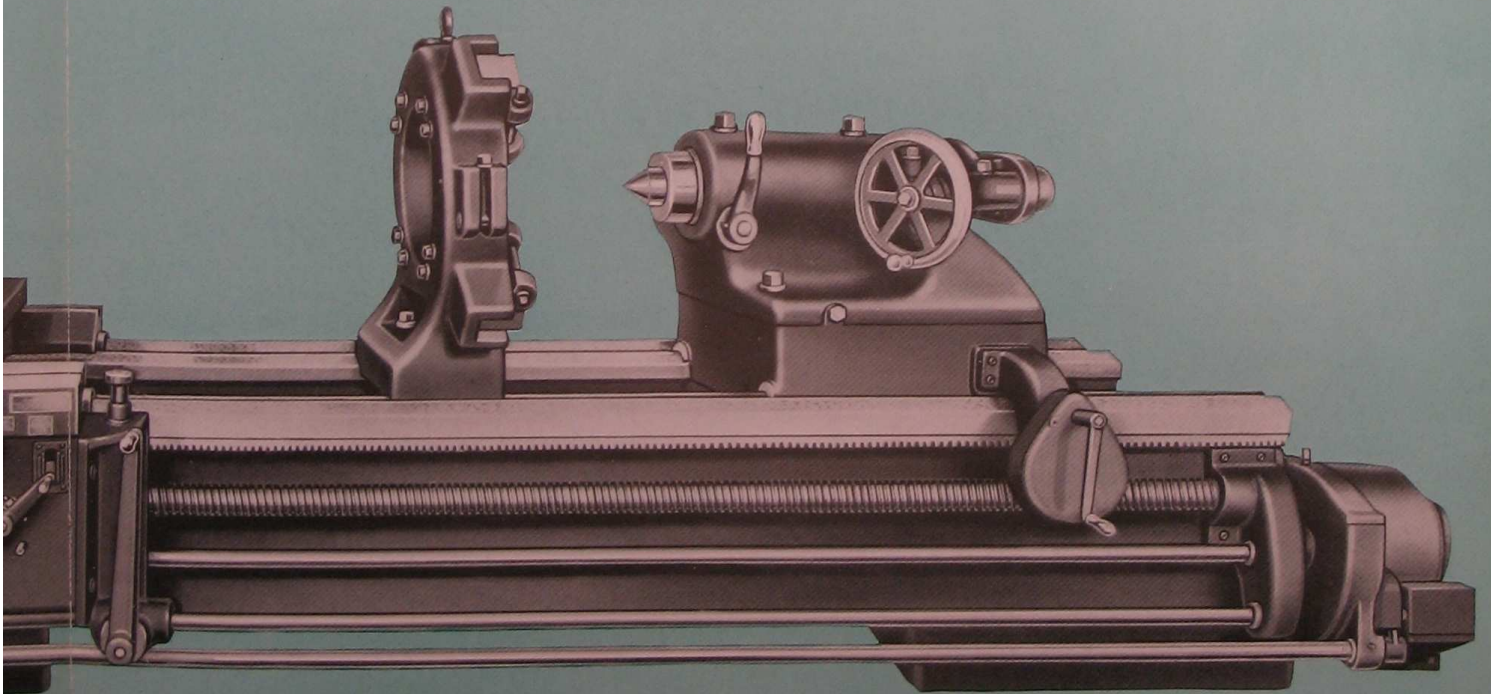
Multiple Vee Belt Motor Drive.

Thread Dial.

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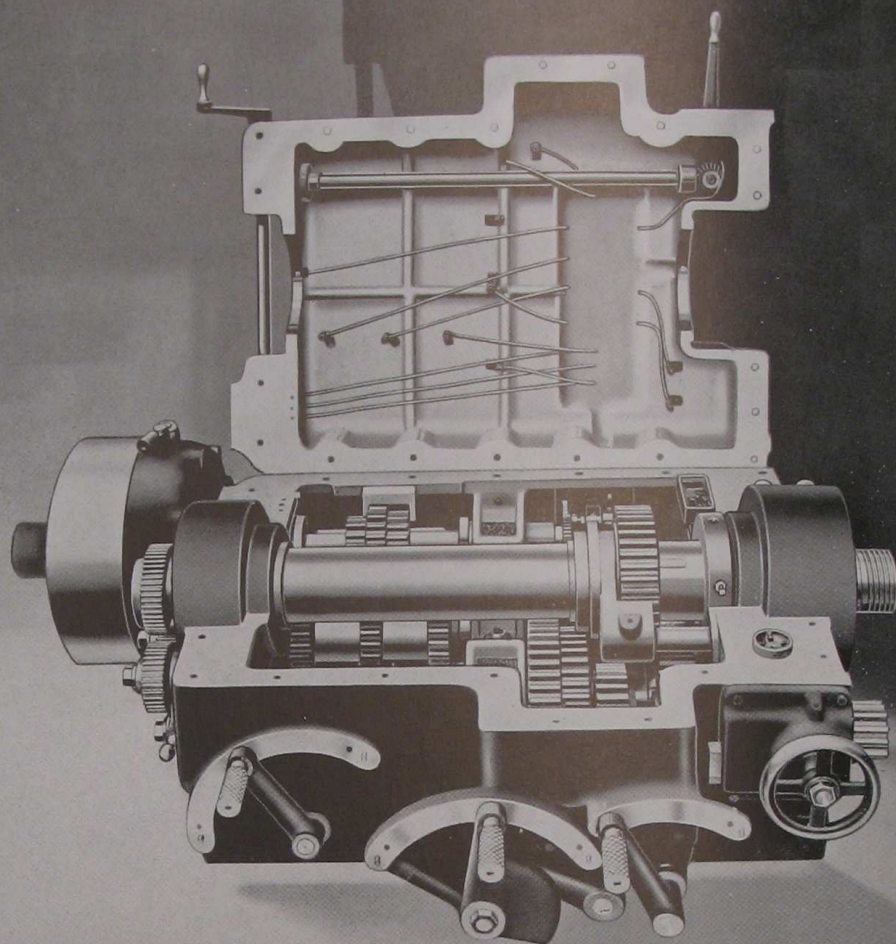
"AMERICAN"

Super Productive

42" LATHE



HEADSTOCK 18 SPINDLE SPEEDS



Interior of Headstock showing Transmission Assembly

The unit of paramount importance is the headstock. In excellence of design and construction the "American" is outstanding. The "American" geared headstock is simplified to the highest degree. The 18 spindle speeds are obtained through 16 gears, including the face plate internal gear and pinion, without the use of either friction or jaw clutches. All speed changes are made through slip gears, the only ones in operation at any time being those that are actually transmitting power, consequently there are no idle running gears or sleeves in the head to waste power or to stick or seize. Slip gears slide on ground multiple splines.

All gears, including the triple gear and the face plate pinion, are made of a high carbon chrome molybdenum steel, heat-treated and, excepting the large face plate internal gear, are hardened. After hardening, the bores are ground concentric with the pitch diameter. The average tensile strength of these gears is approximately 250,000 lbs., and the Brinnell hardness about 475. Our method of treatment produces gears which not only have an extremely hard surface, which will not chip, but also a very tough core, which is practically proof against crystallization.

Probably the improvement of greatest importance is the new face plate drive. This new design provides 12 of the 18 spindle speeds through the internal gear

face plate drive; only one-third or 6 spindle speeds are transmitted through the spindle gear, consequently for all severe turning operations the drive is through the powerful internal gear in the face plate. This feature cannot be emphasized too strongly. Its value will be better understood by comparing it with other designs, many of which transmit only one-third of the entire speed range through the internal geared face plate. As a consequence other designs are seriously limited as to the diameter of work which can be driven through the internal gear at economical cutting speeds. For example, the highest internal gear speed on the average lathe is approximately 10 R.P.M., while on the new "American" 12 speeds, up to and including $32\frac{1}{2}$ R.P.M. are secured through the internal gear. This maximum internal gear speed of $32\frac{1}{2}$ R.P.M. provides approximately 50' cutting speed on a 6" diameter, consequently it follows that all turning operations on diameters 6" or larger can be performed through the internal gear drive at 50' or greater cutting speed, the direct drive through the spindle being used only for comparatively light operations at high speeds. On other designs providing maximum internal gear speeds lower than $32\frac{1}{2}$ R.P.M., the smaller work diameters that can be turned on the "American" at economical cutting speeds must be handled either through the direct spindle drive or through the internal gear drive at a much slower and uneconomical cutting speed.

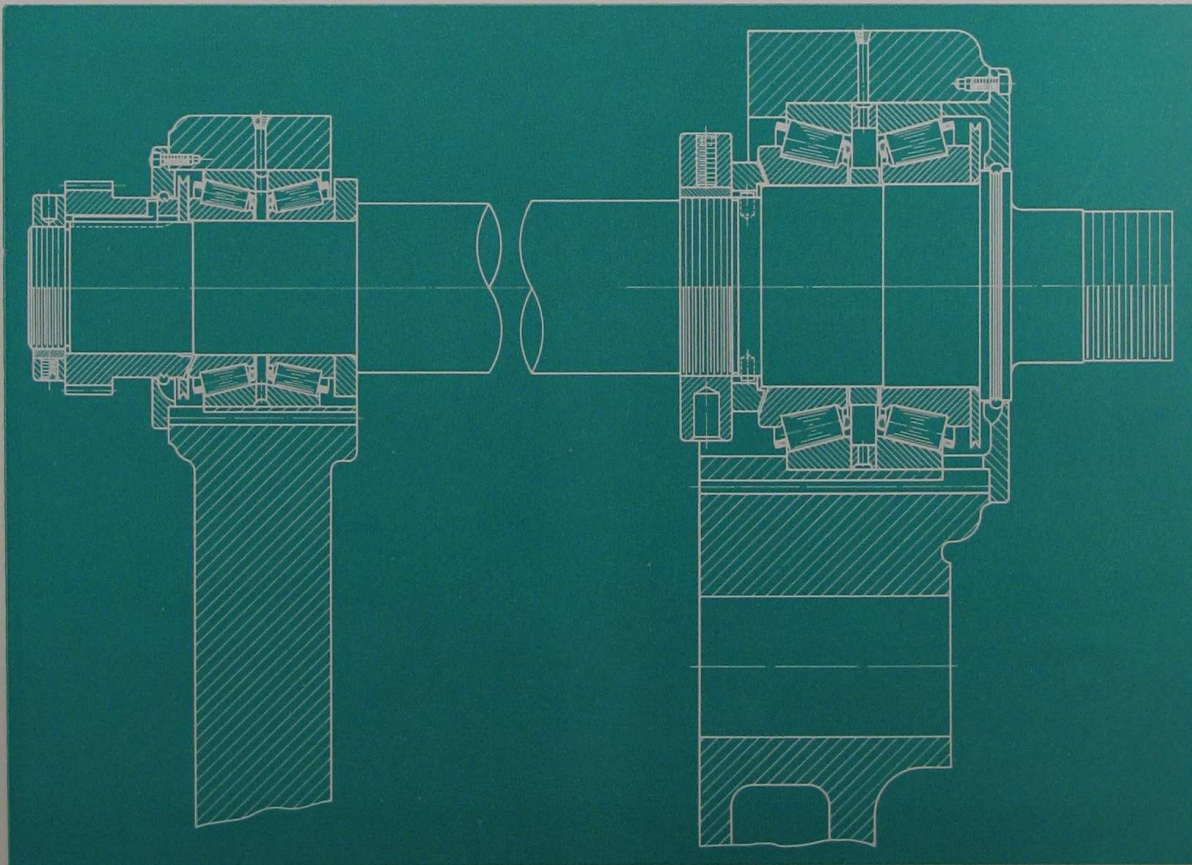


Diagram showing Anti-Friction Spindle Mounting

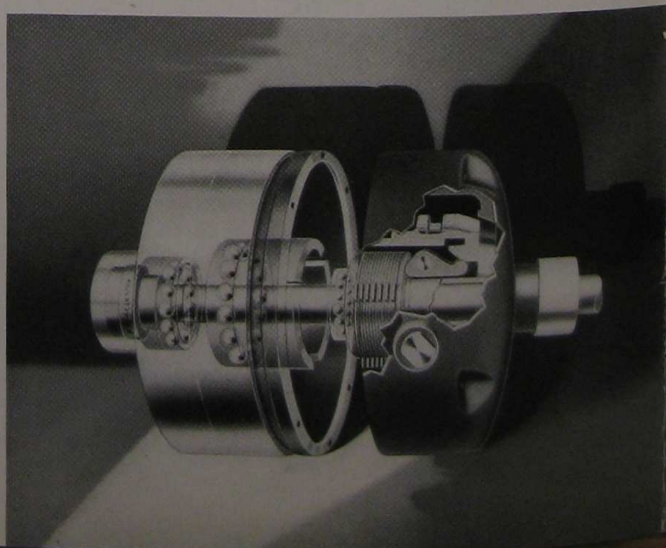
AUTOMATIC OILING

The headstock is 100% automatically oiled. The entire mechanism, including the starting clutch and brake unit, is oiled by the pump located in the head. The starting unit is oiled directly from the pump under pressure thru the hollow drive shaft, providing a constant supply of cool, filtered oil for this entire mechanism. All oil is forced through a metal oil filter before passing to operating mechanism, thus insuring the use of only clean, filtered oil and effectively guarding against the dangers of dirty oil. The pump delivers oil to the reservoir in the head cover which serves as a distributing tank for supplying oil to the bearings and gear teeth.

STARTING CLUTCH and BRAKE

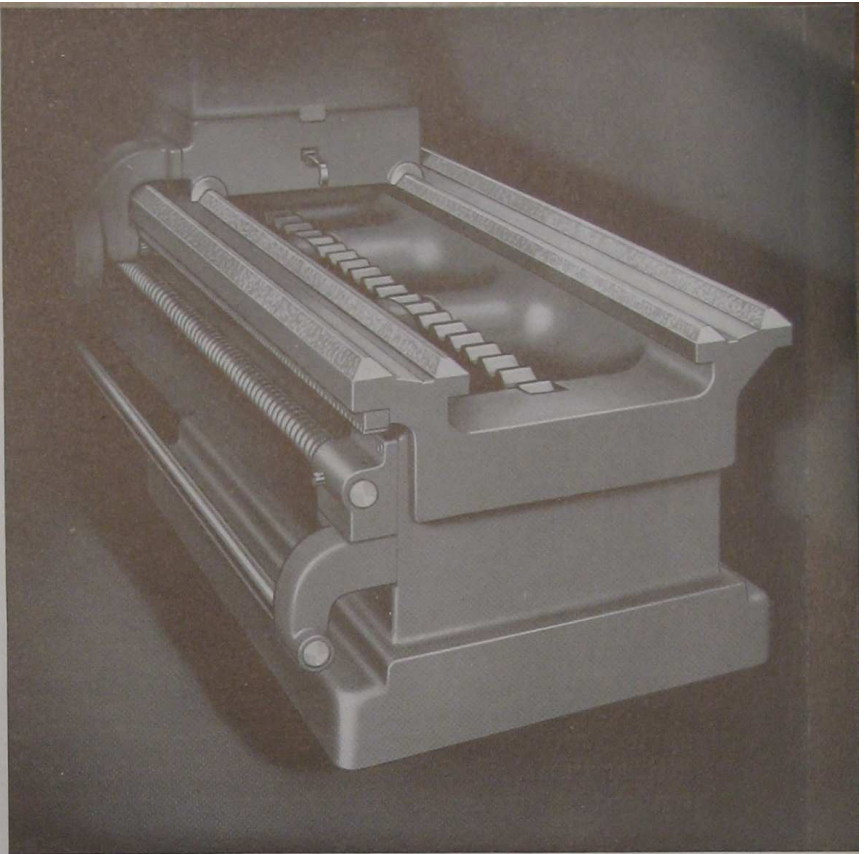
This very important unit is unquestionably an outstanding example of masterly machine tool design. It is a highly developed, complete and compact unit, mounted on anti-friction bearings. It is solidly bolted and doweled to the head, provides an outboard bearing for the initial driving shaft and carries a patented hard plate multiple disc driving clutch and cone type brake, operated by either of three levers, two located on the head, the other attached to and traveling with the apron. This entire unit is automatically oiled by means of the pump system with pure, filtered oil. The outstanding characteristics of this mechanism are its tremendous pulling power, its dependability and its extreme ease of operation. The clutch, itself, is composed of a series of plates made from hardened saw blade steel, with each alternate plate die formed to cause it to spring away from the mating flat plate the instant the pressure of engagement is removed. This action completely frees the adjacent plates of contact when the clutch is released and overcomes any tendency for the plates to drag and cause spindle creepage. This clearance of the plates also permits the oil to flow in ample volume to thoroughly lubricate the mechanism and to carry away any heat that might develop under severe service. Adjustment for the driving clutch is very convenient. The adjusting mechanism is located outside the headstock at the end of the initial drive shaft. The cone brake is self-adjusting for wear.

Patented Multiple Disc Clutch and Brake used in the initial Driving Unit of "American" Geared Heads





PATENTED 4-VEE BED



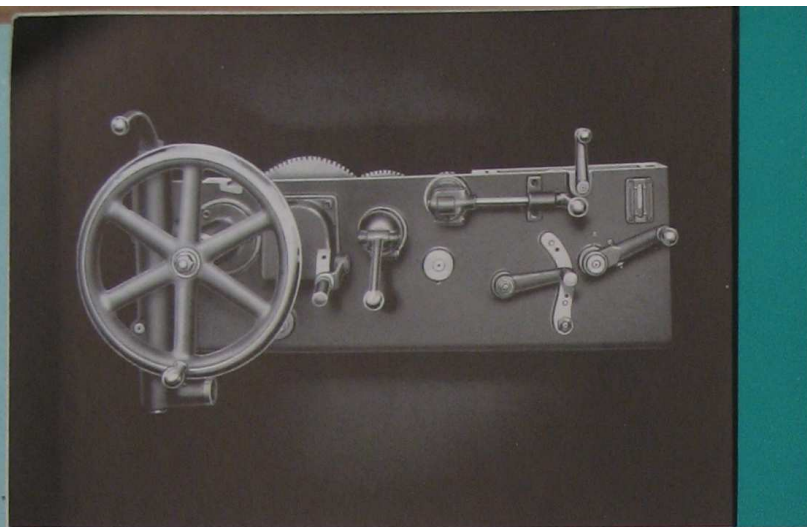
Patented 4-Vee Bed

The bed has been made unusually rigid by increased depth, thicker walls and heavier ribbing. A special mixture is used, containing 80% steel scrap and other ingredients, which produces a semi-steel of approximately 50,000 pounds tensile strength and a scleroscopic hardness of 35 to 38 degrees. The outstanding characteristic of this special metal is the close grained wear-resisting surface it provides for the carriage bearings.

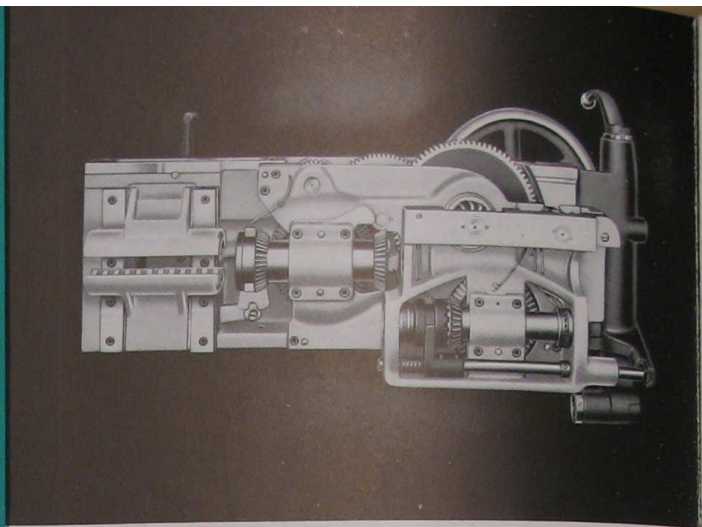
"American" Lathe beds provide 4 large vees for the carriage and tailstock guides, the two inner Vees being dropped below the outer Vees to provide greater swing over the bed and additional carriage bridge thickness. In our opinion, the vee bearing is much easier to keep clean and consequently offers greater resistance to cutting and wear than a flat bearing. When wear does occur, the 4-vee bed wears more evenly than one using a vee and a flat bearing, for it is perfectly obvious that a vee bearing and a flat bearing will not wear equally. The 4-vee bed, in providing vee guides for both the carriage and the tailstock, insures longer life for their alignments, resulting in the maintenance of accuracy over a longer period of service than is possible with any other type of bed.

APRON

The "American" Lathe apron is a substantial, compact unit using all heat-treated, carefully processed gears and providing outer supports for all studs. The control for both the cross and longitudinal feeds is through convenient and easily operated drop levers which actuate clutches of the well-known "automobile" con-



Double Plate Apron, Front View (Fig. No. 1)



Double Plate Apron, Rear View (Fig. No. 2)

APRON

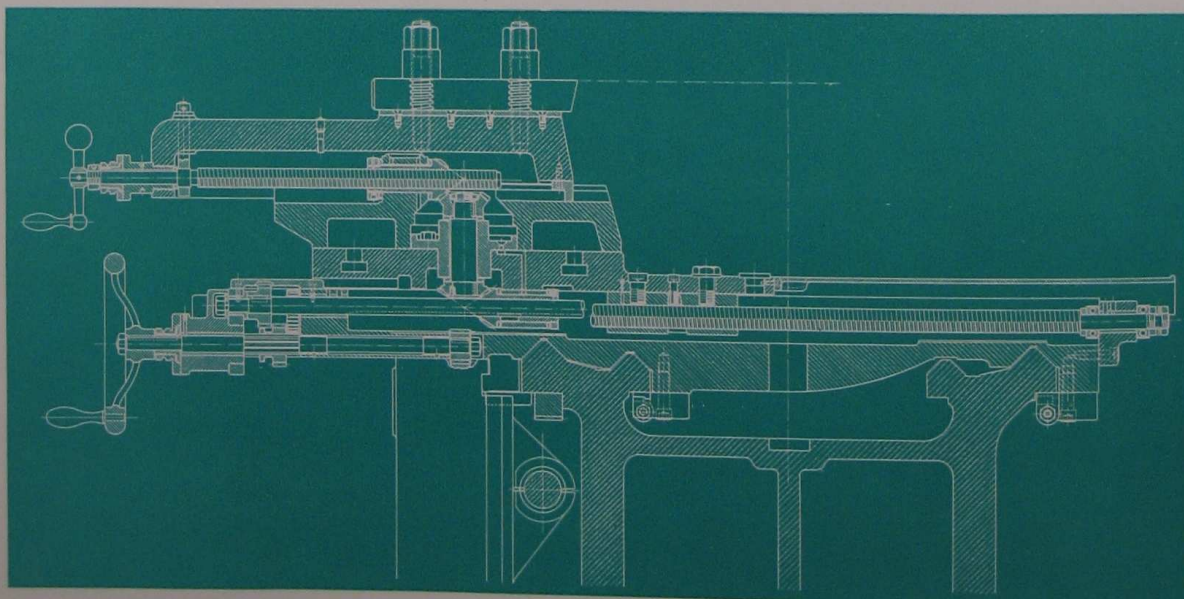
control type. The longitudinal friction is the cone type, while the cross feed is through a safety angular tooth type. Both units are held in engagement by a heavy coil spring the same as the automobile clutch and consequently rarely, if ever, require adjustment. Both are disengaged positively and instantly without effort even under the heaviest cuts by means of a cam actuated by the drop type control levers.

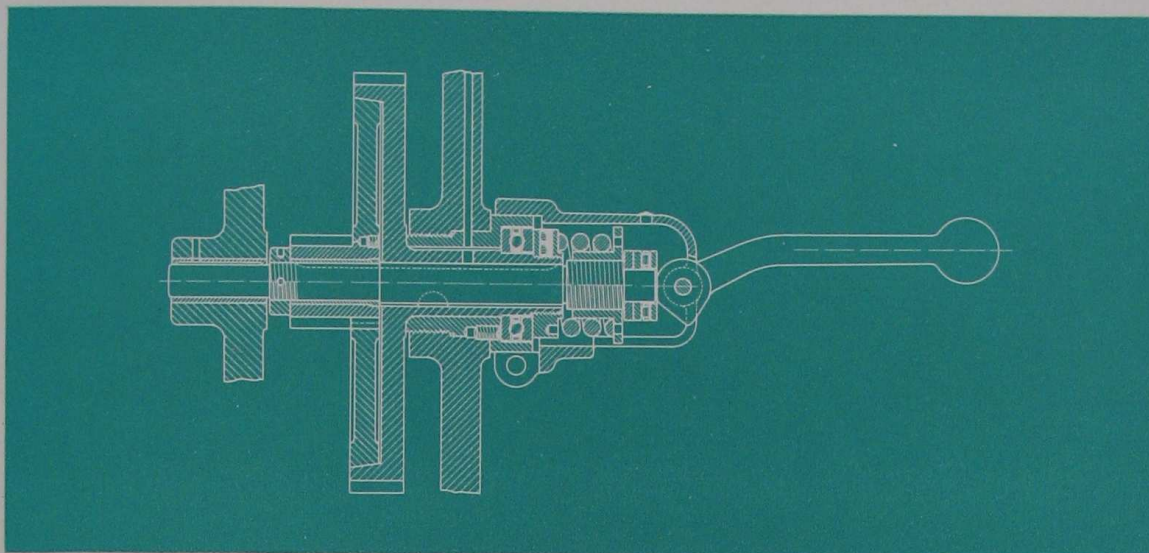
Both the longitudinal and cross-feed units are provided with overload safety features. The longitudinal friction will slip when overloaded, and the cross feed clutch will automatically disengage itself.

CARRIAGE

The carriage construction is one of the outstanding "American" features. It is unusually rigid, offering the greatest resistance to the cutting thrusts, yet is surprisingly easy in its movement along the bed.

Hardened Anti-friction Cross-Feed Screw and Extra Large Automatically Oiled Compensating Nut (Fig. No. 3)





Longitudinal Feed Clutch

CARRIAGE

It has three vee bearings on the bed. This design provides a very large bearing area for the carriage and insures long maintenance of original alignments and equal wear on all bearings. Due to the patented Drop Vee Bed, the carriage bridge can be made very deep which, coupled with its large area of contact on the wide angle bed vees, accounts, in a large measure, for its strength and rigidity. The dovetail has been materially increased in width, giving the compound rest a most substantial mounting which, coupled with its very wide bearing on the widened bridge, provides a substantiability of mounting rarely encountered in other makes.

For rigidly securing the carriage to the bed, clamps are provided at the front and rear with a full length taper gib at the rear for maintaining the proper contact with the bed vees.

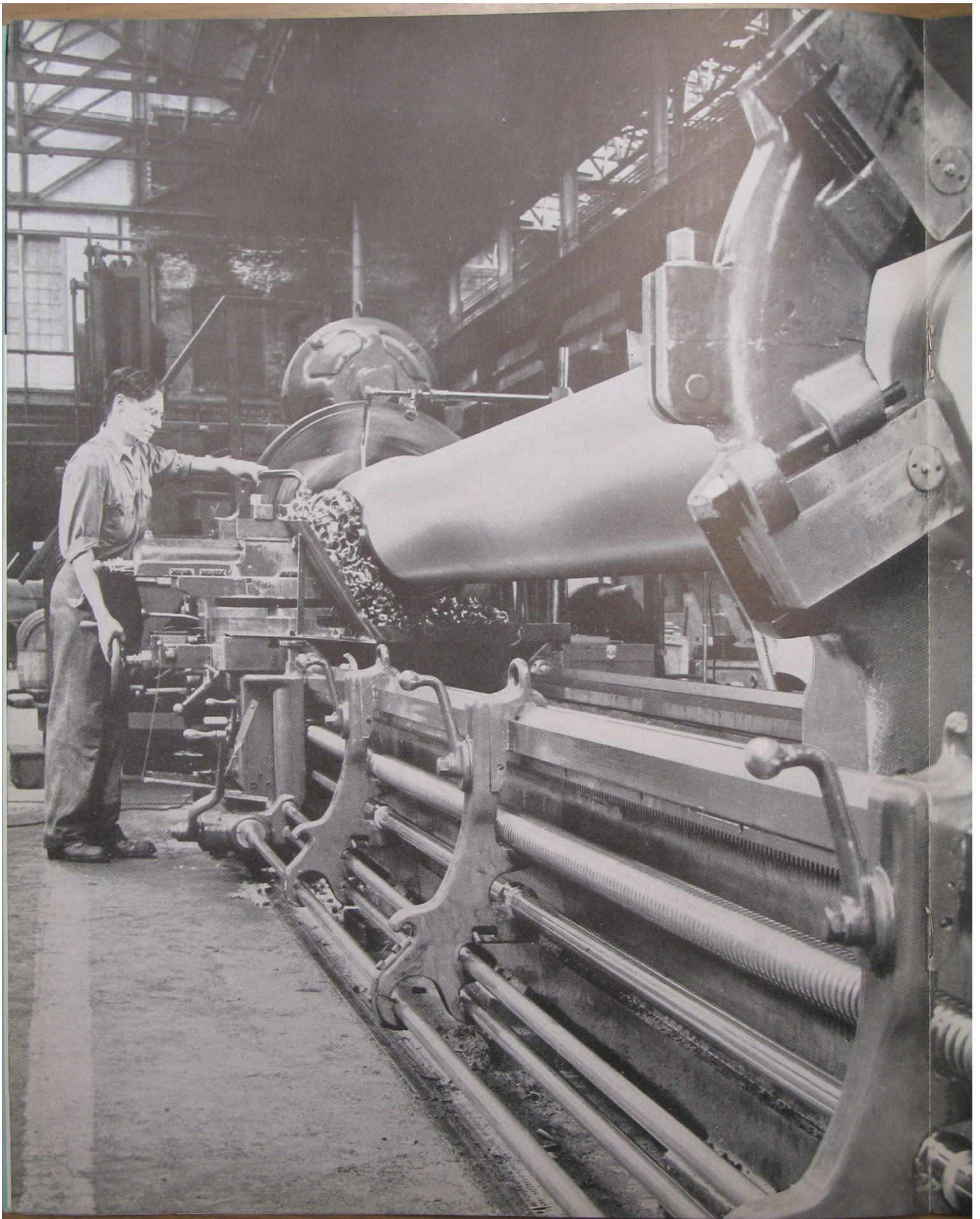
The cross feed screw is *surface hardened to about 70 scleroscope* in such a manner that the original accuracy is retained. It is equipped with ball thrust bearings and a large automatically oiled, bronze compensating cross feed nut, which is quickly adjustable for wear.

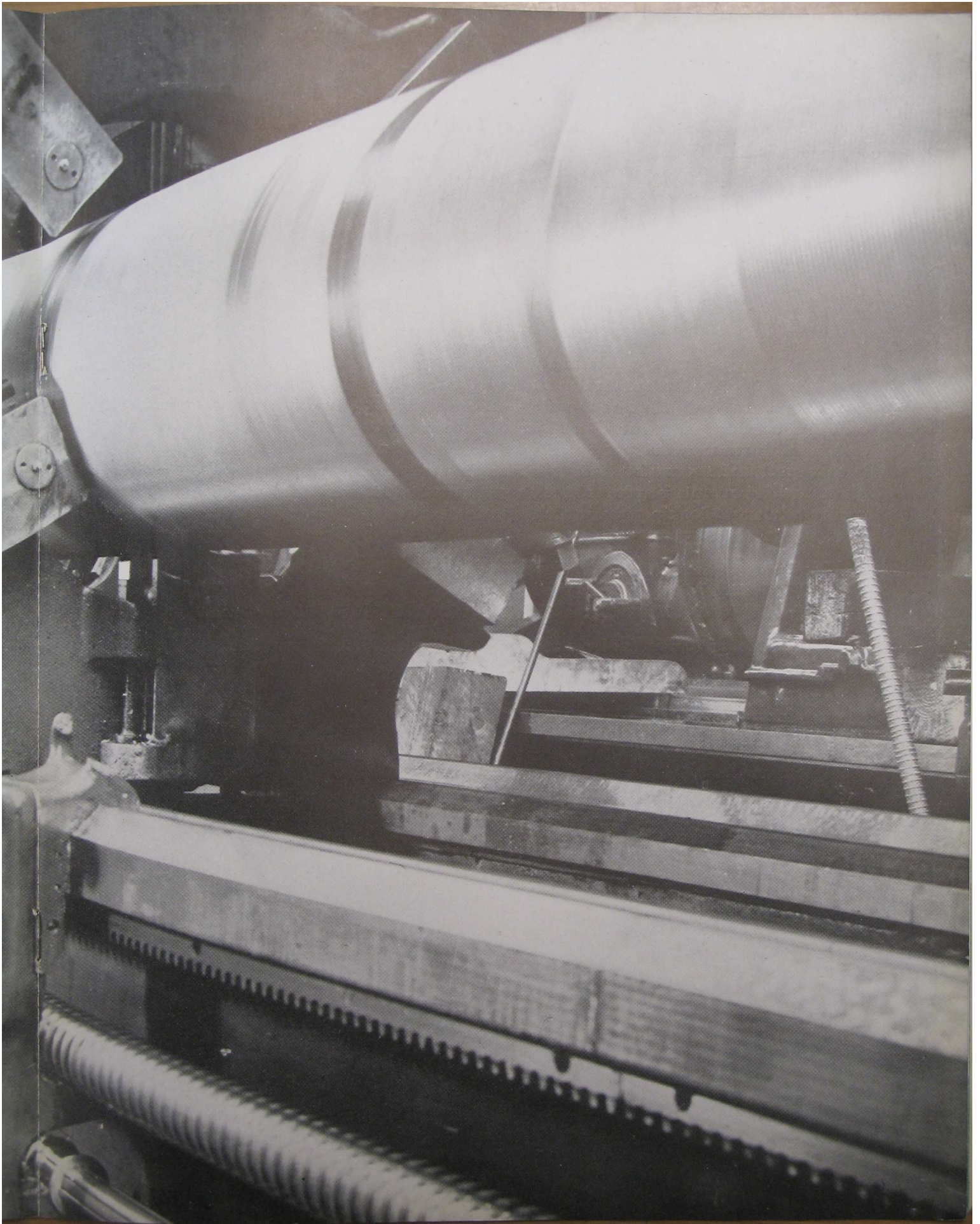
FORCED FEED CARRIAGE AND APRON LUBRICATION

(PATENTS PENDING)

A greatly improved oiling system has been adopted for the carriage and apron. A manually operated pump, located in the apron, forces the oil in large volume from the oil reservoir in the apron to all of the operating mechanism of the apron and all bearing surfaces of the carriage, insuring adequate lubrication, especially for the rear carriage vee which is all too often neglected by other systems. A few actuations of the control lever at the front provides sufficient oil distribution for an entire day's run.

In order to prevent the oil from being forced past the carriage vees, especially





constructed trap wipers are provided at each end of the carriage wings which trap the oil and prevent leakage.

As a further safe-guard, means is provided in the rear carriage wing to indicate to the operator that the oil has reached that area.

There is no question but that this new and improved oiling system will definitely reduce bed cutting to an absolute minimum.

QUICK CHANGE GEAR MECHANISM

Every standard thread ordinarily used is provided by the "American" quick change mechanism. It has an unusually wide range, yet is simple in design and easy to operate. Only 17 gears are used, all of which are steel and 10 of which are cone and tumbler gears cut with 20° cutters to produce a pointed tooth, which is easily and instantaneously meshed without fear of clashing. The tumbler lever is cast steel and bronze bushed, is located in its various positions by a notched plate, which prevents improper meshing, after which it is locked in position by a spring latch and locking pin, which eliminate vibration and wear between the cone and tumbler gears.

Provision is made for cutting the following range of 48 threads: $\frac{1}{2}$, $\frac{9}{16}$, $\frac{5}{8}$, $\frac{11}{16}$, $\frac{23}{32}$, $\frac{3}{4}$, $\frac{13}{16}$, $\frac{7}{8}$, 1, $1\frac{1}{8}$, $1\frac{1}{4}$, $1\frac{3}{8}$, $1\frac{7}{16}$, $1\frac{1}{2}$, $1\frac{5}{8}$, $1\frac{3}{4}$, 2, $2\frac{1}{4}$, $2\frac{1}{2}$, $2\frac{3}{4}$, $2\frac{7}{8}$, 3, $3\frac{1}{4}$, $3\frac{1}{2}$, 4, $4\frac{1}{2}$, 5, $5\frac{1}{2}$, $5\frac{3}{4}$, 6, $6\frac{1}{2}$, 7, 8, 9, 10, 11, $11\frac{1}{2}$, 12, 13, 14, 16, 18, 20, 22, 23, 24, 26, 28.

The 48 feeds provided cover a range of .006" to .338" per revolution, each feed rate being six times finer than its corresponding thread.

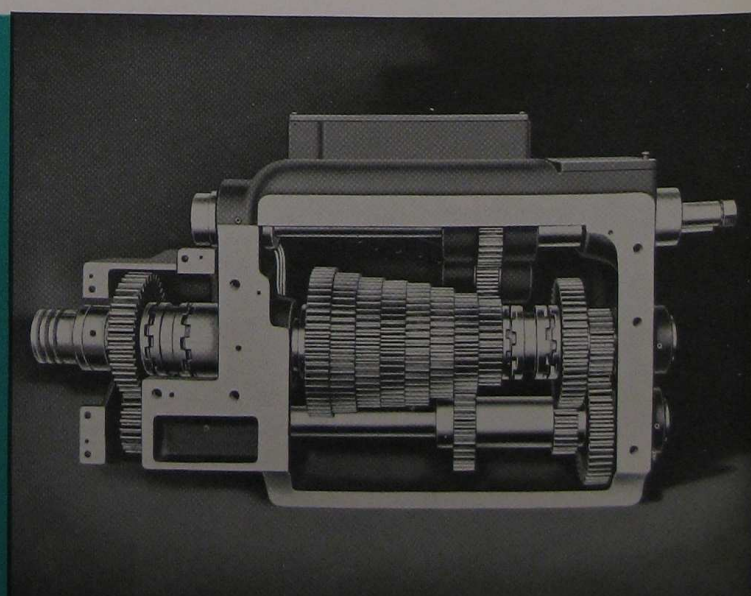
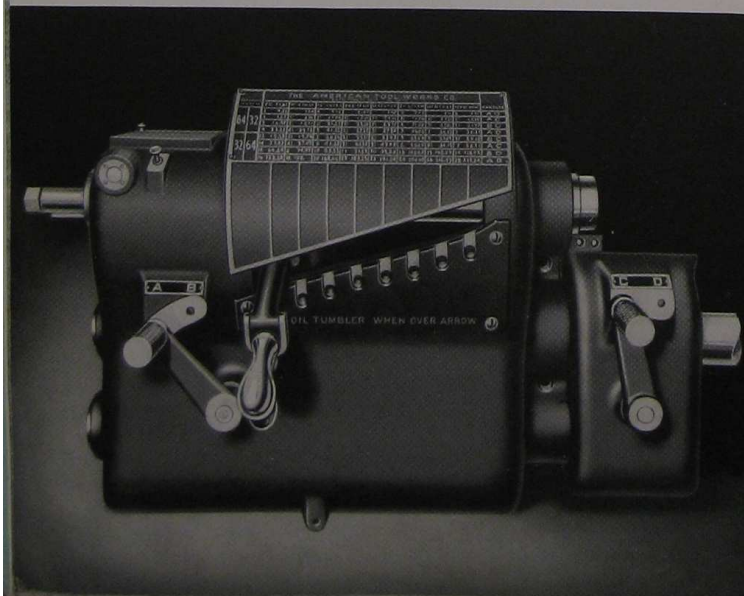
LEADSCREW

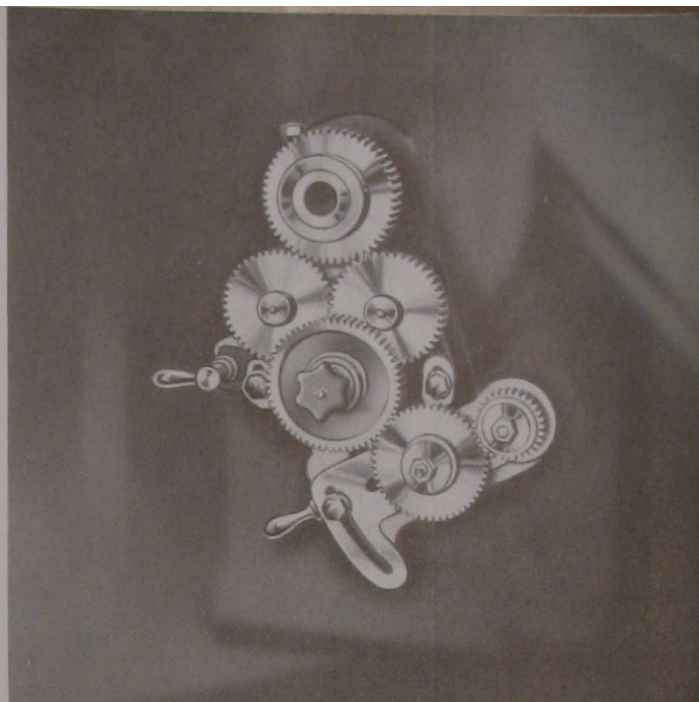
The leadscrew is 3" in diameter, 1 thread per inch. It is made from a high carbon special screw stock, which is ground to size before machining. The

(Fig. No. 1)

Quick Change Gear Box, front and rear views

(Fig. No. 2)





Quadrant Construction

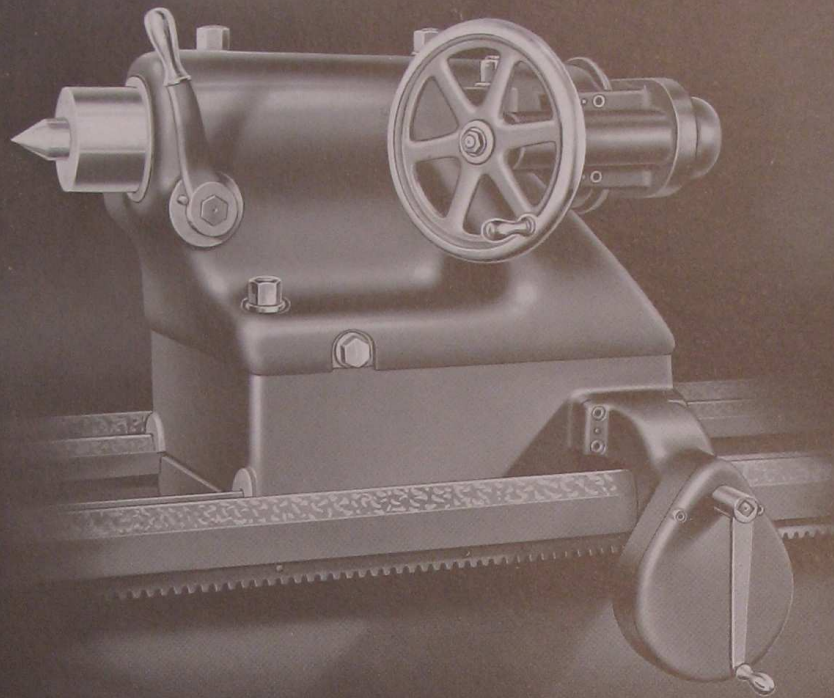
threads are first roughed out to within .015" of their finished size, after which the screw is laid aside to season. It is then finished from a master screw in a special leadscrew lathe, and is guaranteed to be accurate to within a limit of .002" per foot for its entire length.

SPECIAL THREADS

The quadrant at the head end of the bed provides means for substituting special gears for those regularly furnished, in order to cut special threads and pitches not regularly included in the standard thread range. This is a valuable characteristic, as it affords a practically unlimited range for threading operations.

ONE-SHOT OILING for quick change gear box

The oiling of the quick change gear box is accomplished by means of an instantaneous "one-shot" oiling system. Actuation of the plunger supplies sufficient oil to the distributing reservoir to thoroughly lubricate the entire mechanism for a day. The "one-shot" system delivers an adequate supply of oil, but does not supply it in wasteful abundance.



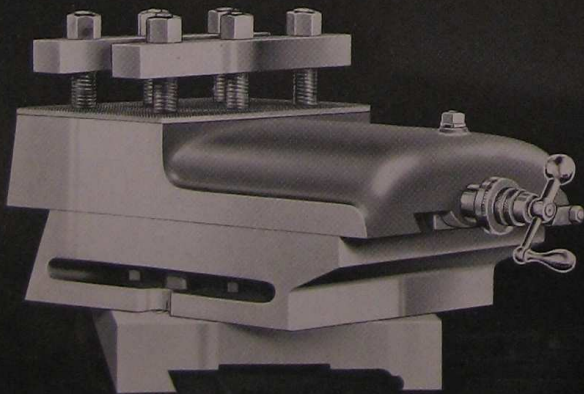
Heavy Duty Tailstock (Fig No. 1)

TAILSTOCK

The tailstock has an extension barrel, giving clearance to the carriage bridge for short work. It is provided with four clamping bolts for binding it securely to the bed, two rear bolts being carried to top of the barrel for convenience in clamping. The barrel is solid, spindle being clamped by a double plug binder which clamps without affecting the spindle alignment. Tailstock screw is provided with a ball thrust bearing for absorbing thrusts.

COMPOUND REST

Compound Rest (Fig No. 2)



The compound rest is extremely rigid and is regularly supplied with power angular feed to the top slide. The swivel is rectangular in form and has greater bearing contact with bottom slide than is possible with the circular swivel used on many designs. It is also graduated on both sides to facilitate setting. Full length taper gibs are used on both the compound rest top and bottom slides, and are located on the right-hand side, where they are free from the tool thrust under normal working conditions. The top slide is regularly equipped with six (6) studs, two (2) straps and a serrated steel plate for rigidly clamping the cutting tools.

MECHANICAL APRON CONTROL

This unit, which is furnished as standard equipment, provides means for instantly starting and stopping the lathe spindle from the apron. The apron control handle is located at the right-hand side of the apron and operates the multiple disc clutch in the initial driving unit, as well as a powerful brake. On motor driven lathes we can supply, at slight additional cost, an electrical apron control in addition to the mechanical control, which, instead of start, stop and brake, provides start, stop and reverse through the motor. When an adjustable speed, direct current motor is used the electrical apron control also provides electrical speed adjustment from the apron.

THREAD DIAL

A thread dial is regularly furnished, thus obviating the necessity of using a reversing motor for thread cutting. This dial is conveniently placed at the right of the apron where it can be easily seen and read by the operator.

POWER RAPID TRAVERSE for CARRIAGE

Power Rapid Traverse to the carriage is a necessary feature on long bed lathes, and especially for turning long shafts. THIS POWER RAPID TRAVERSE MECHANISM IS NOT REGULARLY FURNISHED, BUT IS OFFERED AS AN ATTACHMENT. It can be applied only when the machine is being built. Application after machine is shipped is impossible.

It is of the motor driven type, the motor being mounted at the tailstock end of the bed and functions only while the carriage is being traversed by means of the rapid traverse mechanism. When the power rapid traverse is not in use this motor does not run. A very valuable safety feature is included in this mechanism which automatically disconnects the large traverse handwheel when the power traverse mechanism is in use, thus guarding the operator against accident from a revolving wheel.

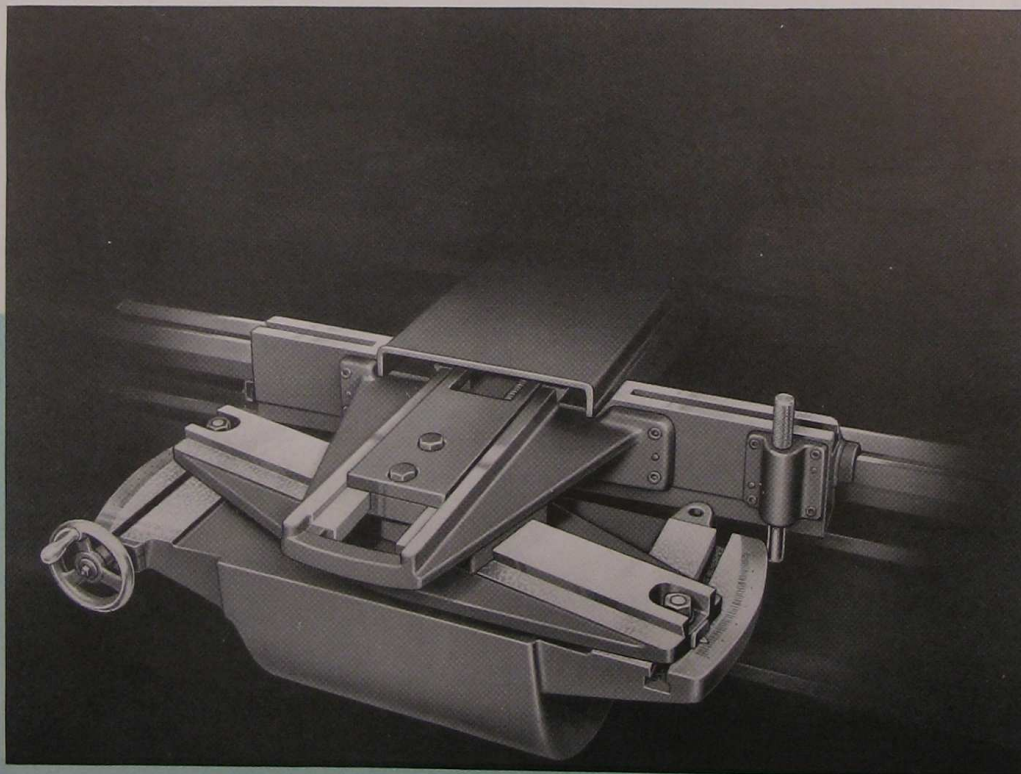
A further safety feature in the form of an adjustable raybestos faced disc clutch is incorporated in the initial drive between the motor and drive pinion which prevents damage to the mechanism from shocks or overloads.

TAPER ATTACHMENT (TELESCOPIC SCREW TYPE)

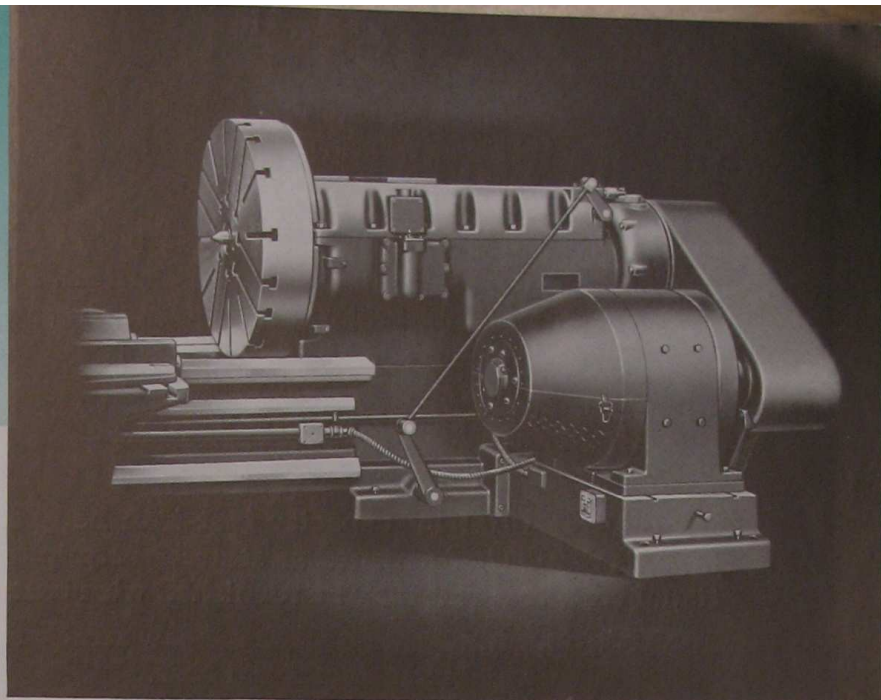
Owing to the necessary size and bulk of the taper attachment for this size Lathe, it is supported on the bed instead of on the carriage as on smaller sizes. This mounting relieves the carriage of the main weight of the attachment and thus permits easier movement of the carriage and, in addition, affords protection to the bed vees by minimizing carriage bearing pressure thereon.

The main supporting bracket is adjustably mounted on planed strips cast integrally with the rear bed wall and is positioned along the bed to correspond with the work.

This attachment is provided with a ball bearing mounted telescopic cross feed screw which gives the operator control of the cross feed screw for chasing taper threads and boring taper holes which require adjustment of the tool rest through the cross feed screw. In order to maintain the original accuracy of this adjustment, the cross feed screw is surface hardened to approximately 70 scleroscope and the cross feed nut is of the compensating type, automatically oiled and quickly adjustable to compensate for wear between it and the screw.



Bed Type Taper Attachment



Back Mounted Motor Drive

MOTOR DRIVE

The standard type of motor drive consists of either A. C. or D. C., constant speed motor, mounted on top of the headstock, and connected to initial driving unit of head by multiple vee belts. Other types of motor mountings, such as chain connection to driving unit with motor mounted on headstock or on a pedestal attached to the rear of the head-end cabinet leg, can be supplied when desired. When maximum size motors are used, it is often desirable, because of their size, to mount them on a substantial pedestal bolted to the headstock leg. This mounting is recommended therefore when large frame motors are used. All types of motor mountings include a hinged or adjustable motor plate to permit motor adjustment to compensate for belt stretch. For the maximum horse-power motor recommended, see specifications, page 21.

GUARANTEED ACCURACY

If properly set up and leveled, "American" Lathes are guaranteed to bore and turn true within .002" per foot on work held in chuck or face plate jaws. The material entering into their construction is also guaranteed in every essential to be the very best obtainable for the purpose used. We guarantee to repair any breakages or damage to machine due to defective material or faulty workmanship.

STANDARD EQUIPMENT

Standard equipment regularly furnished with lathe includes compound rest with power angular feed to top slide and six (6) stud tool holder, steady rest, thread dial, large face plate with renewable internal gear, mechanical apron control and wrenches.

EXTRA EQUIPMENT

At extra cost we can equip these lathes with improved Taper Attachment, Special Tool Rests, Electrical Apron Control, Power Rapid Traverse for Carriage, Pan, Coolant Pump, Follow Rest, Extra Gears and Index Plates for special fine, coarse or metric threads.

STEADY RESTS...Plain jaw type

A substantial 16" capacity cast-iron body steady rest, with 4 bronze tipped jaws, is regularly furnished as standard equipment. When desired, and at additional cost, this rest may be furnished with cast steel body.

The following larger capacity 5-jaw steady rests, with either cast-iron or steel bodies, are available at additional cost.

Medium capacity 16" to 24" opening. Large capacity 24" to 30" opening.

These larger than standard rests are regularly equipped with 5 bronze tipped jaws.

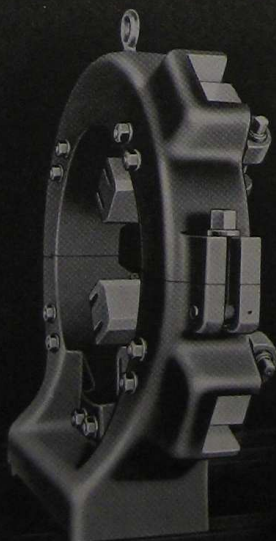
STEADY RESTS...Roller jaw type

When machining work at the high surface speeds permitted by cemented carbide cutting tools, plain jaw steady rests are often found to be inadequate, consequently, we have developed and are prepared to furnish anti-friction mounted, roller jaw steady rests with capacities as follows:

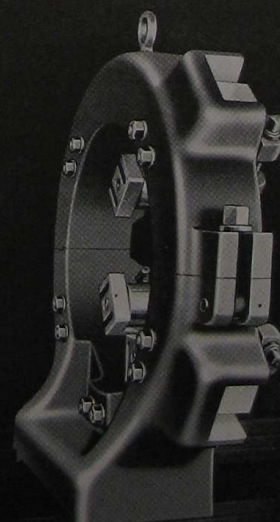
Standard 5" to 16" opening—4 jaws. Medium 16" to 24" opening—5 jaws.

Large 24" to 30" opening—5 jaws.

Plain Jaw (Fig. No. 1)



Roller Jaw (Fig. No. 2)

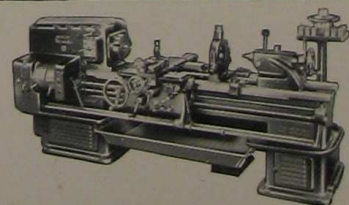
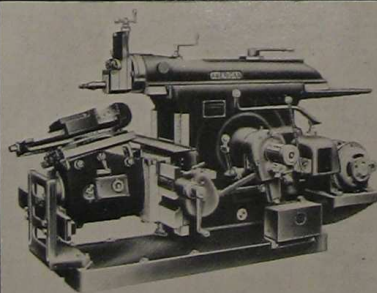
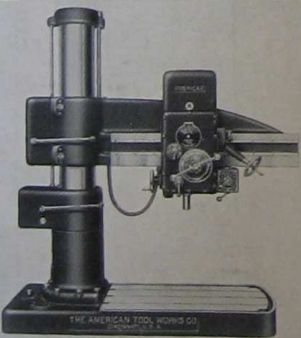
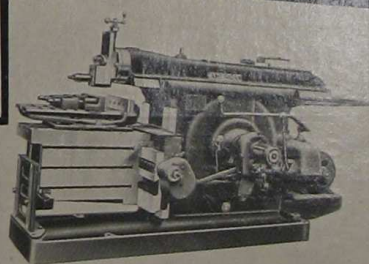
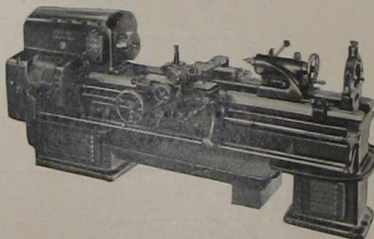
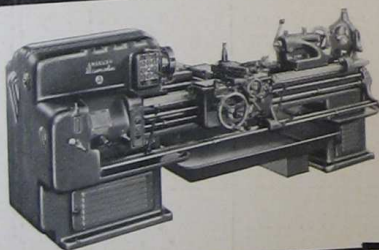
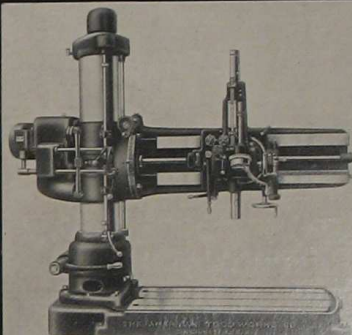
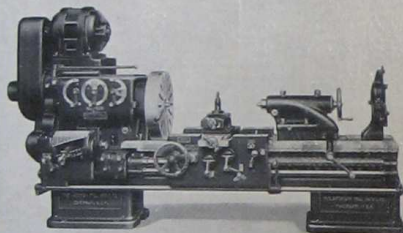
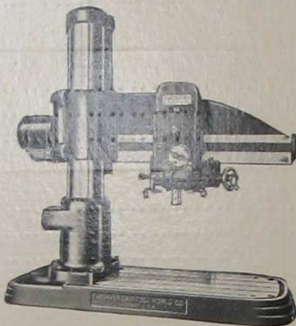
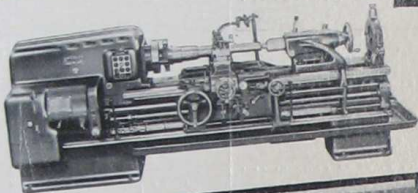
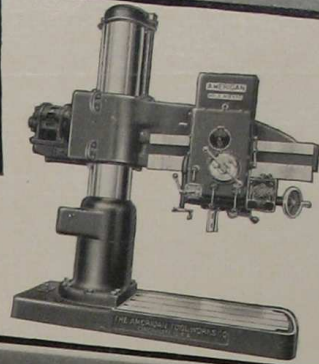
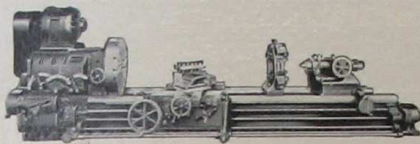


SPECIFICATIONS

SIZE OF LATHE		42-inch
Swing	{ Over carriage wings.	44½"
	{ Over compound rest.	29½"
	{ Over taper attachment.	29½"
Distance Between Centers	{ Tailstock, flush (either plain or roller bearing center).	60"
Quick Change Gear Box	{ Range of threads per inch.	½ to 28
	{ Range of feeds per spindle revolution.006" to .338"
	{ Number of thread and feed changes.	48
Tailstock	{ Length on bed.	28½"
	{ Spindle, diameter.	6½"
	{ Spindle, travel.	18½"
Carriage	{ Length on bed.	48½"
	{ Bridge width.	18"
Motor	Largest motor recommended.	50 H.P.
Spindle	{ Front bearing.	TIMKEN
	{ Rear bearing.	TIMKEN
	{ Nose diameter and threads per inch.	5⅞"—2 Thd.
	{ Hole diameter.	2⅝"
Spindle Speeds	{ Normal range.	1.8 to 157
Centers, Morse taper.		No. 6
Leadscrew, diameter and threads per inch.		3"—1 Thd.
Steady rest, capacity, standard.		2" to 16"
Follow rest, capacity.		1½" to 9"
Compound rest, top slide travel (manual or power).		15"
Large face plate, diameter.		42"
Tool post, takes tool with shank (maximum size).		2" x 2"
Weight— Motor Drive	{ Net (base machine). pounds	28800
	{ Crated (base machine). pounds	29800
	{ Boxed (base machine). pounds	32800
Weight, each additional 24" between centers (shipping). pounds		1950
Cubic Feet	{ Shipped } Base machine, boxed.	625
	{ Knocked } Each additional 24" between centers.	58
	{ Down }	



"AMERICAN"



THE AMERICAN TOOL WORKS CO.

CINCINNATI, OHIO U.S.A.

Lathes • Radials • Shapers