CATALOG No. 5

"AMERICAN"

PRECISION TOOL ROOM LATHES

THE AMERICAN TOOL WORKS COMPANY
CINCINNATI, U. S. A.
LATHES - RADIALS - SHAPERS

"AMERICAN"

PRECISION TOOL ROOM LATHES

DESIGNED AND BUILT EXPRESSLY FOR THE
RAPID AND ECONOMICAL PRODUCTION OF
PRECISION TOOL ROOM WORK

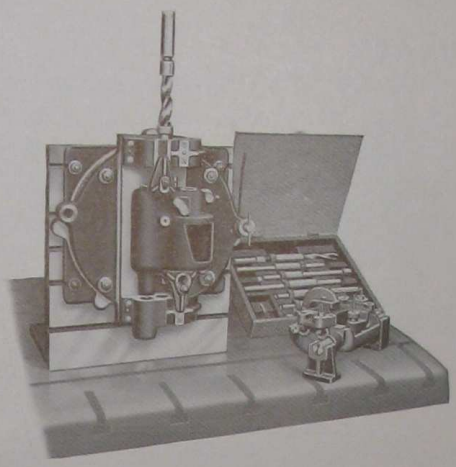
CATALOG No. 5
2nd EDITION

THE AMERICAN TOOL WORKS COMPANY
CINCINNATI, U. S. A.
LATHES - RADIALS - SHAPERS

"American" 12-inch Precision Tool Room Lathe

ACCURACY

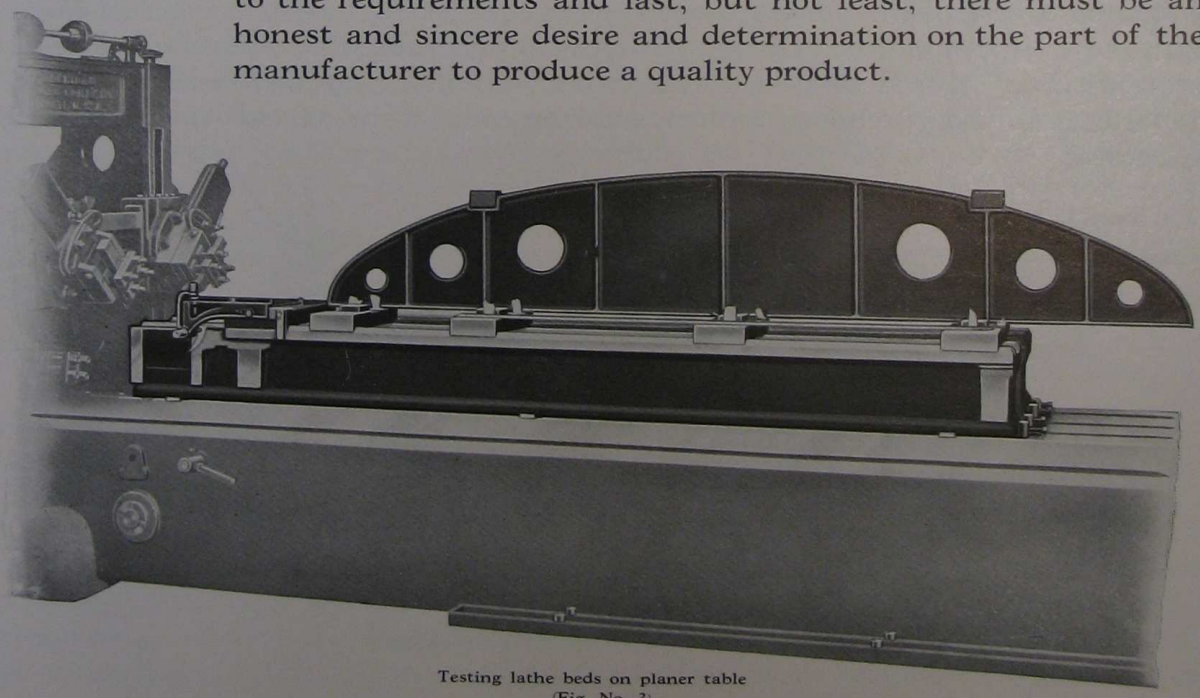
Hardened and lapped master for spindle noses and face plates
(Fig. No. 1)



Drilling jig for quick change gear boxes
(Fig. No. 2)

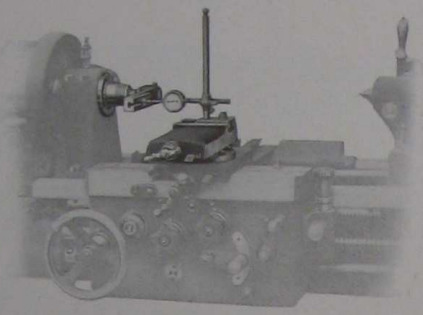
Accuracy is unmistakably the outstanding essential of a high quality tool room lathe; not merely accuracy of alignments, but inherent accuracy of each and every piece that goes into the machine—accuracy of machining, accuracy of bearings, accuracy of fitting—the kind of accuracy, in fact, that lasts, and guarantees high quality and dependable service for a reasonable period of years.

The first requisite for the production of a high quality product is an organization that understands the meaning of quality and knows how to secure it. The next essential is an equipment of modern machinery, of jigs, templates, gauges, aligning and measuring instruments and a knowledge of their uses. Then there come the selection and use of the various materials best suited to the requirements and last, but not least, there must be an honest and sincere desire and determination on the part of the manufacturer to produce a quality product.

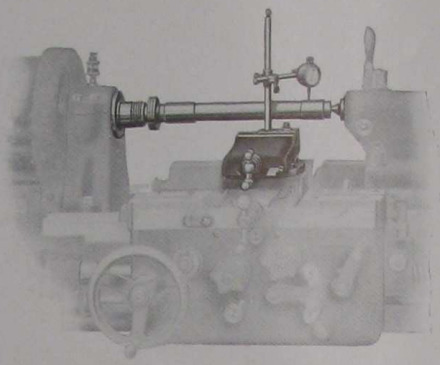


Testing lathe beds on planer table
(Fig. No. 3)

ACCURACY



Testing cross slide alignment
(Fig. No. 1)

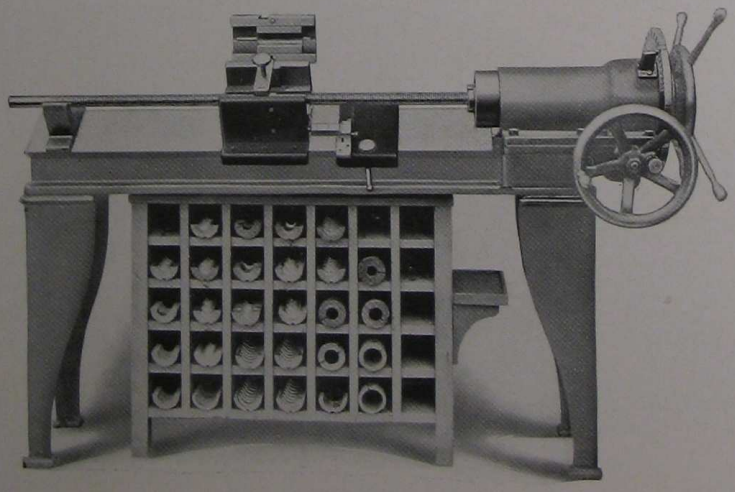


Testing headstock and tailstock alignments
(Fig. No. 2)

That none of these qualifications is lacking in The American Tool Works Company is conclusively evidenced by its many years of successful participation in the tool room lathe industry, by its maintenance of leadership and by the character of its clientele, including, as it does, the largest, the most successful and the most prominent units of the metal working industry, both in this country and abroad. The American Tool Works Company's organization extends over a period of fifty odd years. It has been developed with discretion and care and is eminently qualified, from the standpoint of sincerity of purpose, knowledge and experience, to produce the very highest standard of quality product.

PRECISION LEADSCREWS

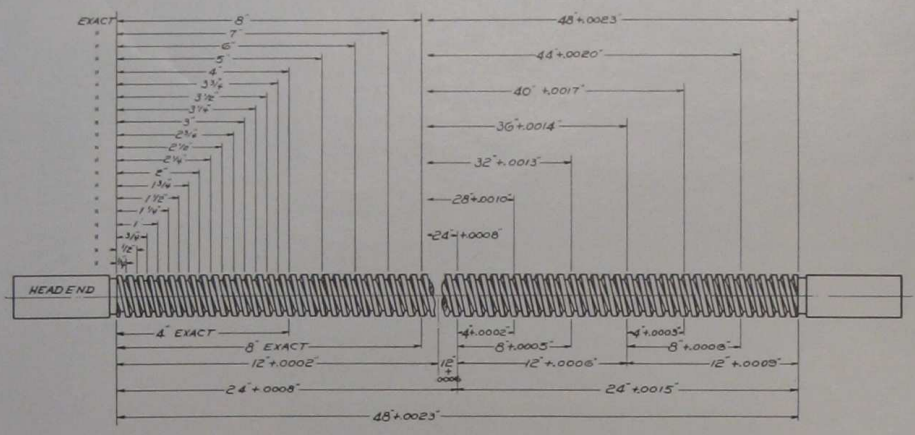
One of the major requirements of the modern tool room lathe is a precision threading mechanism. This requirement is met in the "American" Tool Room Lathe by a precision quick change gear threading mechanism including precisely cut and accurately machine-lapped gears and, as regular equipment without additional cost to the purchaser, a precision, minimum error, tested and guaranteed leadscrew.



Leadscrew testing machine
(Fig. No. 3)

PRECISION LEADSCREWS

Our precision leadscrews are produced on a highly specialized, recently developed, super-accurate leadscrew lathe which has been engineered, designed and developed for the express purpose of producing leadscrews of great precision. The utmost care is exercised in the production of these screws, and an exhaustive accuracy test is made upon completion, a record of which is retained for reference and upon which our accuracy guarantee is based.



Record of "American" Precision Leadscrew test made by the U. S. Bureau of Standards.
(Fig. No. 1)

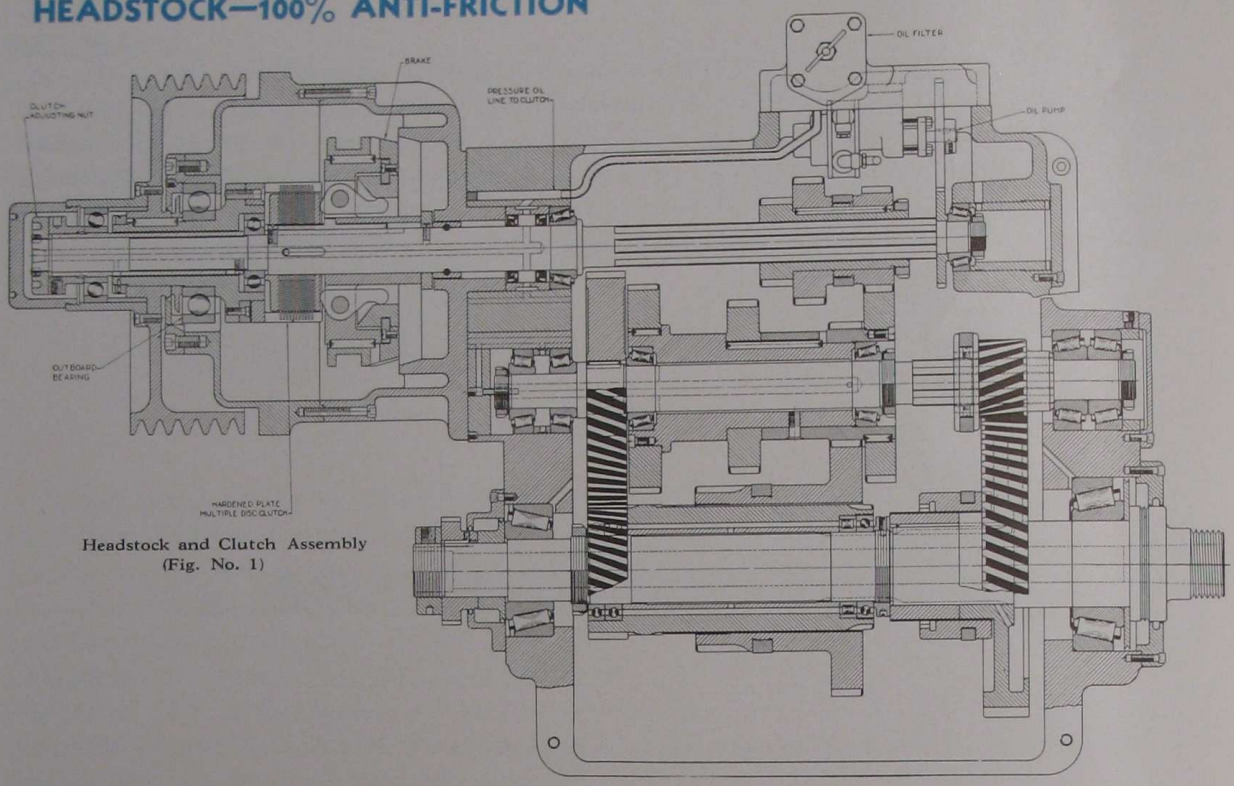
All precision leadscrews are first roughed out to within approximately .015″ of the finished size and are then removed from the lathe and set up on end to season. After seasoning they are returned to the leadscrew lathe and finished from the master screw, after which they are carefully tested for accuracy on a machine built especially for that purpose, which measures the pitch of the screw in .0001″. Readings can be taken at each pitch, inch or multiple, by means of precision gauges, a clock indicator, a master nut and a 24 inch diameter micrometer dial. Every leadscrew is tested separately and individually in this machine, and, in addition, each screw, after it has been installed in the lathe, is again tested for the production of accurate threads, by means of a master thread gauge bar. Consequently, we have no hesitancy in guaranteeing the accuracy of our leadscrews for the most exacting tool and gauge work.

Bar for testing the accuracy of threads cut by "American" Tool Room Lathes
(Fig. No. 2)

HEADSTOCK—100% ANTI-FRICTION

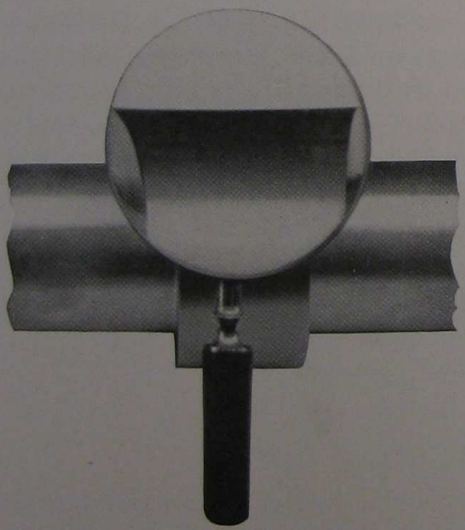
The unit of paramount importance in a tool room lathe is the headstock, for upon its design and construction largely depend the quality of the finish and the smoothness of the cut. In excellence of design and construction the "American" is outstanding. The "American" geared headstock is simplified to the highest

HEADSTOCK—100% ANTI-FRICTION



Headstock and Clutch Assembly
(Fig. No. 1)

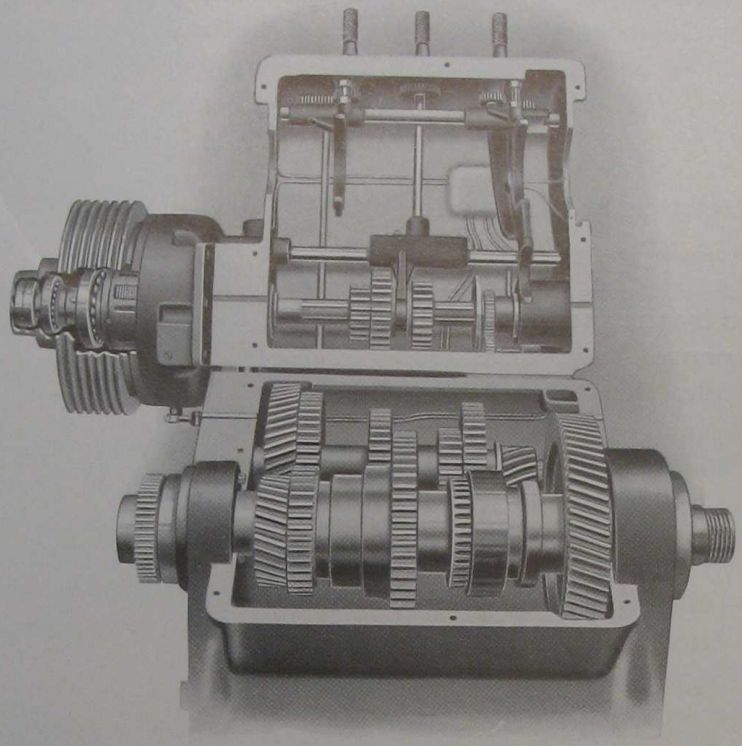
degree. Only three shafts including the spindle are employed, providing plenty of space inside the headstock bowl to permit the use of large diameter and wide face gears. All gears are hobbed. All gears are made from alloy steel forgings, heat treated and hardened. Each mating pair of gears is machine lapped under predetermined load in the most modern gear-lapping machines to insure smooth and quiet operation. The back geared speeds are thru helical gears. The selective speed gears are of the spur tooth type, with machine rounded teeth adopted for quick and easy engagement, thus avoiding the use of objectionable friction or jaw clutches in the speed-changing mechanism. All speed changes are made through sliding gears except the high-speed run, which is through a slip gear automobile type of clutch. Slip gears slide on multiple splines.



Example of fine finish produced by "American" Geared Head Lathes. This finish was produced at 750 feet per minute, .003" feed in 1045 steel. Note the complete absence of gear or chatter marks even under magnification.
(Fig. No. 2)

The "American" Geared Head is 100% anti-friction. The starting clutch and brake unit, all shafts including the spindle, and every loose sleeve are anti-friction mounted. There is not one plain bearing throughout the entire headstock mechanism.

PATENTED GEARED HEAD

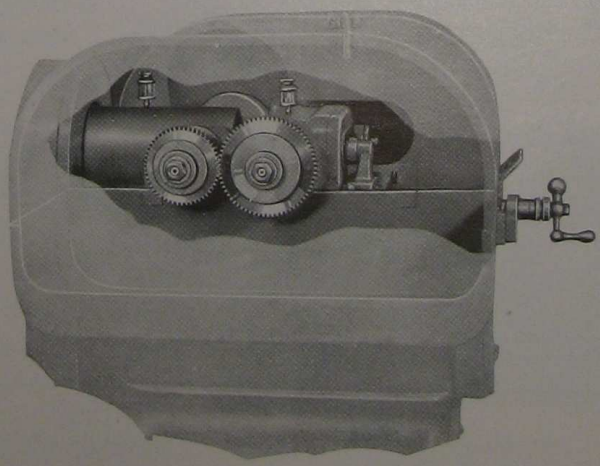


Interior of Geared Head (Fig. No. 1)

Twelve (12) spindle speeds in geometrical progression are provided, covering a wide range, which may be varied materially to suit the nature of the work to be done. Speeds as high as 2000 R. P. M. are permissible with this head.

AUTOMATIC OILING

The headstock is 100% automatically oiled. The entire mechanism, including the starting clutch and brake unit, the shaft and spindle bearings, the loose sleeves and all the gears, are 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.



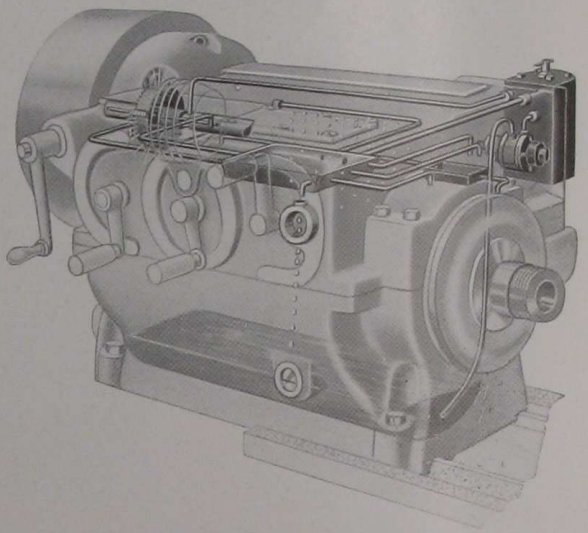
Patented Gear-Lapping Machine (Fig. No. 2)

STARTING CLUTCH AND BRAKE

The starting clutch and brake unit is used harder and oftener than any other unit of the lathe. It is operated every time the spindle is started and stopped and transmits all power to the headstock. This important unit has been developed to a point of perfection that positively insures efficient functioning and complete satisfaction during the effective life of the lathe.

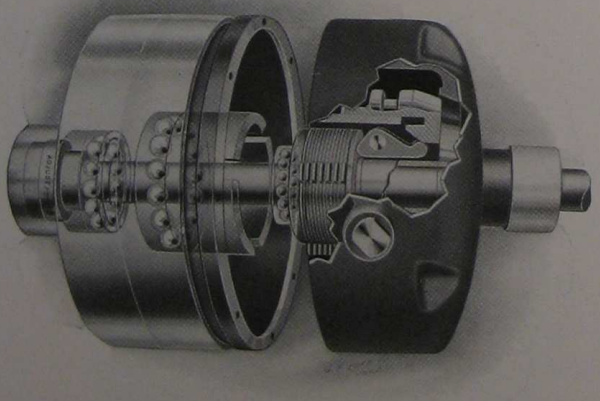
In the construction of the starting clutch and brake unit we have not relied upon any of the commercial clutches afforded by the market, but at considerable expense have developed our own multiple disc clutch and brake and in it have achieved a masterpiece of design that accurately reflects the inherent value offered by "American" Lathes.

This starting clutch and brake unit is entirely anti-friction mounted—no plain bearings being used. It is provided with a substantial outboard support to eliminate overhang and is 100% lubricated under pump pressure.



Automatic, Pump Circulating Oiling System
(Fig. No. 1)

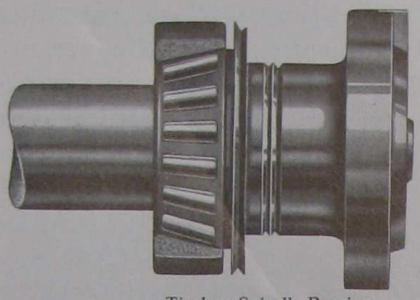
The multiple disc clutch is of the all-metal type practically impervious to wear. The discs are made of "Atkins" carefully tempered "saw blade" steel and each alternate disc is permanently deformed or warped in a die. Under the pressure of engagement the deformed plates contact with the adjacent flat plates, but when the pressure is released to disengage the clutch, the deformed plates, due to their spring action, spring away from the adjacent flat plates, providing a complete release of the clutch, thus insuring freedom from spindle creeping due to drag of the discs.



Patented Multiple Disc Clutch and Brake used in the initial Driving Unit of "American" Geared Heads
(Fig. No. 2)

The cone type brake which operates in unison with the clutch is also oiled automatically by means of the head lubricating system and provides adequate braking effort to quickly stop the spindle even at the high speeds now being provided for cutting with cemented carbide tools.

SPINDLE BEARINGS



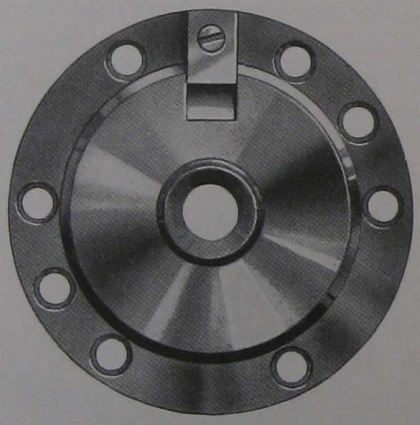
Timken Spindle Bearing
Flanged Spindle Nose
(Fig. No. 1)

The Timken "zero" bearing spindle mounting has been adopted as standard for "American" geared head tool room lathes and is recommended and guaranteed for this class of lathe service. However, some lathe users prefer the plain spindle bearing to the anti-friction type; consequently, we have made provision to substitute the taper type plain spindle bearing for the anti-friction when preferred. Unless specifically ordered, anti-friction type of spindle bearing will be furnished.

TYPE OF SPINDLE NOSE OPTIONAL

At customer's option, either the threaded or flanged spindle nose is provided. For general purpose and tool room work requiring frequent changes of face plates, fixtures and chucks, the threaded type is recommended. For chucking operations and mounting heavy fixtures, flanged type is preferred.

Taper Spindle Bearing
(Fig. No. 2)



Flanged Spindle Nose
(Fig. No. 3)

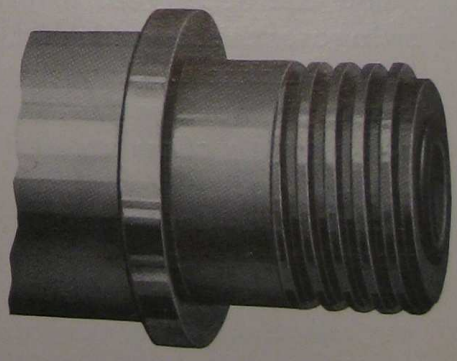
FLANGED SPINDLE NOSE

The flanged nose is an integral part of the spindle forging. It is accurately machined to master gauges as are likewise the face plates and chucks to insure perfect interchangeability. A centralizing taper is provided on the flange to quickly and accurately center the plates and fixtures, which are in turn firmly held to the flange by a substantial key and large bolts. The application and removal of plates, chucks and fixtures are quick and easy.

THREADED SPINDLE NOSE

The "American" threaded spindle nose combines accuracy and rigidity of chuck and face plate mounting with ease of application and removal.

The outer half of the nose is threaded to quickly move the fixture to or from its seat directly adjacent to threaded portion, and to hold it in position when screwed home against the nose shoulder. Spindle nose and plates are machined to highly accurate masters to absolutely insure interchangeability.



Threaded Spindle Nose
(Fig. No. 4)

MECHANICAL APRON CONTROL

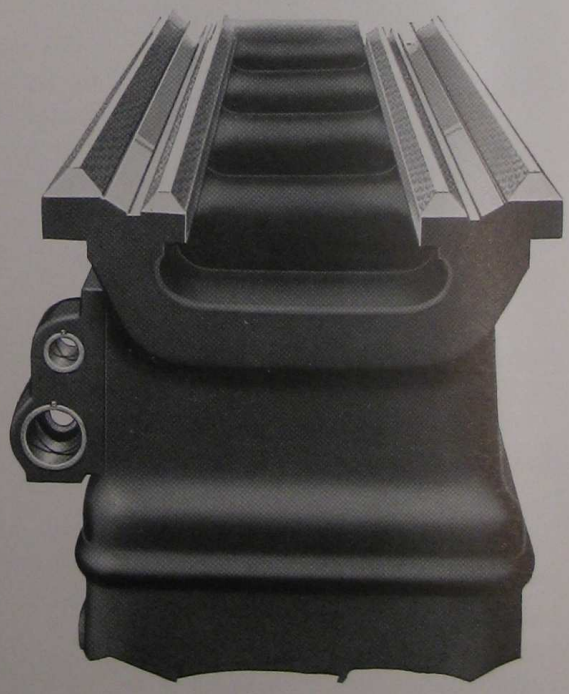
This unit, which is regularly furnished on all geared head lathes, provides means for instantly starting and stopping the lathe spindle from the apron. The apron control handle is located at the right-hand side of the apron and operates the multiple disc clutch in the initial driving unit, as well as a powerful brake. On motor driven lathes we can supply, at slight additional cost, an electrical apron control either in place of or in addition to the mechanical control, which, instead of start, stop and brake, provides start, stop and reverse, through the motor. When the electrical apron control only is furnished, the brake control from the apron is eliminated unless the electrical equipment includes an automatic control panel which provides a dynamic brake.

SPINDLE REVERSE FROM APRON

When a mechanical apron control is furnished, no means is provided for reversing the spindle from the apron position. If, however, customer desires a reverse, obtainable from the apron position, it can be secured, at extra cost, through a reversing mechanism incorporated in the initial driving unit. This new reversing mechanism also supplies a brake for stopping the spindle, which operates at the neutral point between forward and reverse positions.

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 40% steel scrap and other ingredients, which produces a semi-steel of approximately 40,000 pounds tensile strength and a scleroscopic hardness of 35 to 38, (Brinell 229 to 248). The outstanding characteristic of this special metal is the close grained, wear-resisting surface it provides for the carriage bearings.

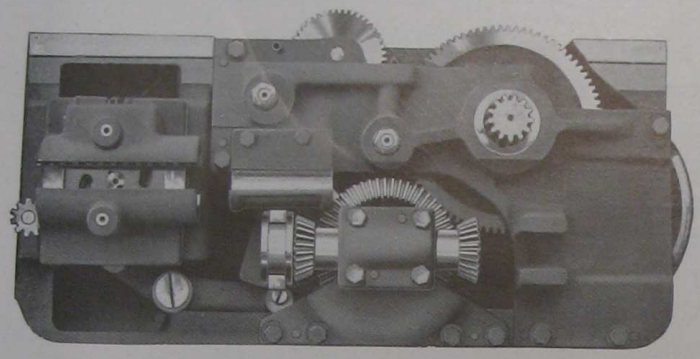


4-Vee Bed

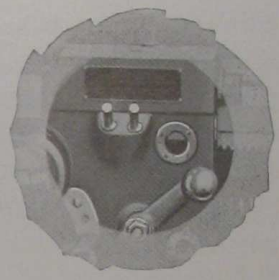
"American" Lathe beds provide 4 large vees for the carriage and tailstock guides, the two inner Vees being dropped below the outer Vees to provide greater swing over the bed and additional carriage bridge thickness. In our opinion, the vee bearing is much easier to keep clean and consequently offers 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

PATENTED 4-VEE BED

in providing 2 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. This is particularly advantageous for tool room service.



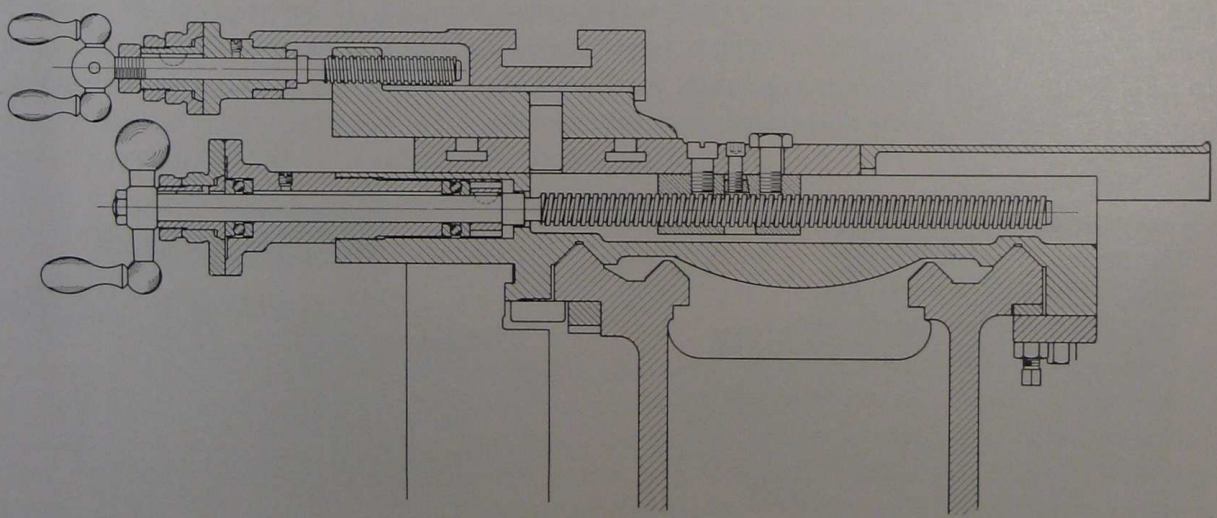
Apron (Fig. No. 1)



One-Shot Oiling (Fig. No. 2)

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" 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.

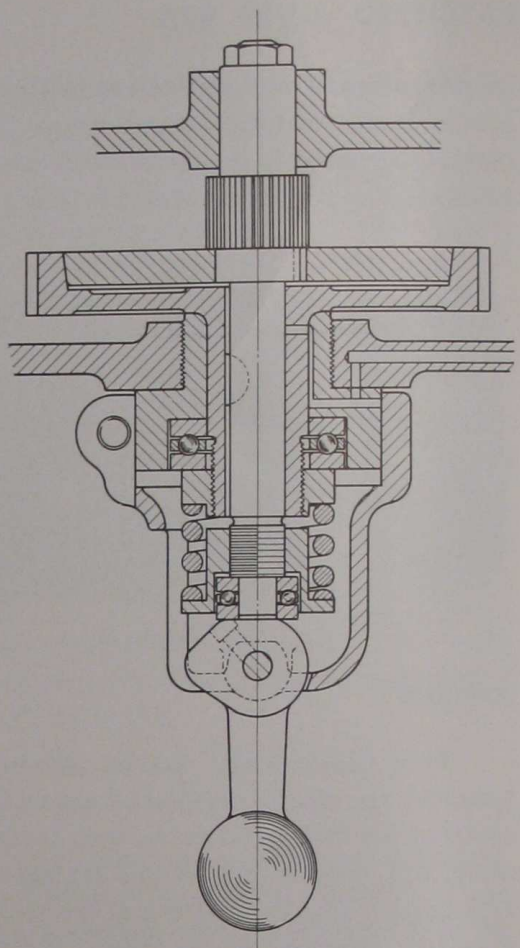


Carriage Assembly with Anti-friction Cross Feed Screw and Compensating Nut (Fig. No. 3)

APRON

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.

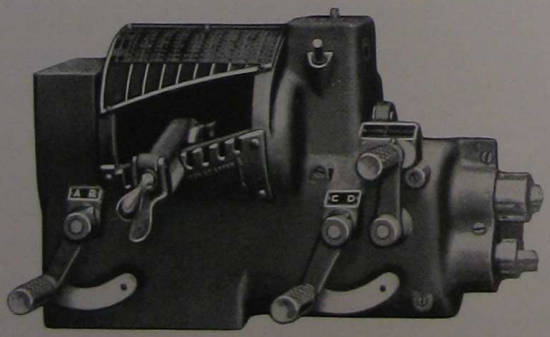
The oiling of the entire apron is accomplished by means of an instantaneous "one-shot" oiling system. One action of the plunger supplies sufficient oil to the distributing reservoir to thoroughly lubricate the apron mechanism for an entire day. The "one-shot" system delivers an adequate supply of oil, but does not supply it in the wasteful abundance of some other systems. The carriage bearings on the bed and the carriage cross slide are also thoroughly oiled by our improved "one-shot" system.



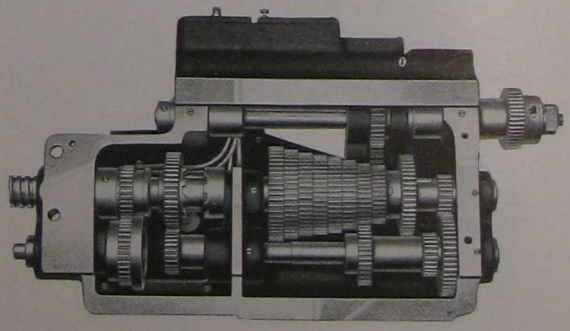
Longitudinal Clutch
(Fig. No. 1)

QUICK CHANGE GEAR MECHANISM

Every standard thread ordinarily used is supplied by the "American" quick change mechanism. It provides a range of 48 threads and feeds, 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.



(Fig. No. 2)



(Fig. No. 3)

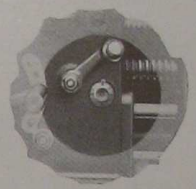
Quick change gear box, front and rear views

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. One action 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.

THREAD DIAL

A thread dial is regularly furnished, thus obviating the necessity of using a backing belt or 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.



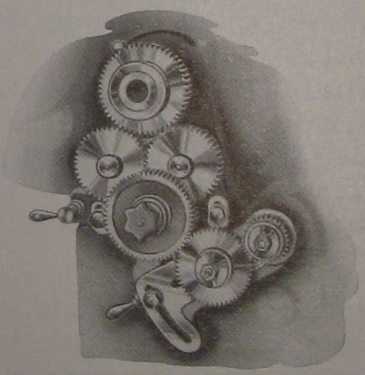
Thread Dial (Fig. No. 1

SEPARATE LEADSCREW AND FEED ROD

A separate leadscrew and feed rod are furnished which are selective and independent of each other. The leadscrew is preserved exclusively for threading, while the feed rod is used for all feeding operations. Thus, by relieving the leadscrew of feeding operations and using it exclusively for threading, it is only reasonable to assume that it will wear less, and retain its accuracy longer than if it were called upon to function on feeding operations as well as when thread chasing. Furthermore, the leadscrew and feed rod are independent of each other. When one is in operation, the other is stationary, consequently on the "American" Lathe, the leadscrew bearings are in service only when the leadscrew is being used, and therefore are of longer life and accuracy than on the average lathe which does not have the independent leadscrew and feed rod.

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.



Quadrant construction (Fig. No. 2)

COARSE AND FINE THREADS

If a range of coarser or finer threads than regularly provided is desired, we can at very slight additional cost furnish a pair of compounding gears to replace the standard idler gear, which will provide both a coarser and finer range of threads. The application of these wide range gears requires only a moment's time, which again demonstrates the unparalleled convenience, simplicity and range of our quick change gear mechanism.

"CONVERTED" METRIC PITCHES

Because of the metric standards employed by some concerns in this country, and the almost universal use of the metric system abroad, means have been provided for quickly, easily and inexpensively converting the quick change threading and feeding mechanism from the standard English or Whitworth to the Metric System.

METRIC PITCHES

GEAR ON STUD	FEED BOX LEVERS			
	A-D	B-D	A-C	B-C
	M/M	M/M	M/M	M/M
40	.5	1.0	2.0	4.0
45	.5625	1.125	2.25	4.5
50	.625	1.25	2.5	5.0
55	.6875	1.375	2.75	5.5
60	.75	1.5	3.0	6.0
65	.8125	1.625	3.25	6.5
70	.875	1.75	3.5	7.0
75	.9375	1.875	3.75	7.5
80	1.0	2.0	4.0	8.0
85	1.0625	2.125	4.25	8.5
90	1.125	2.25	4.5	9.0
95	1.1875	2.375	4.75	9.5
100	1.25	2.5	5.0	10.0

PLACE 127 TOOTH GEAR ON GEAR BOX LOCK TUMBLER IN LOWEST HOLE.

THE AMERICAN TOOL WORKS CO.
2411 CINCINNATI, O., U.S.A.

Index Plate for "converted" metric pitches (Fig. No. 1)

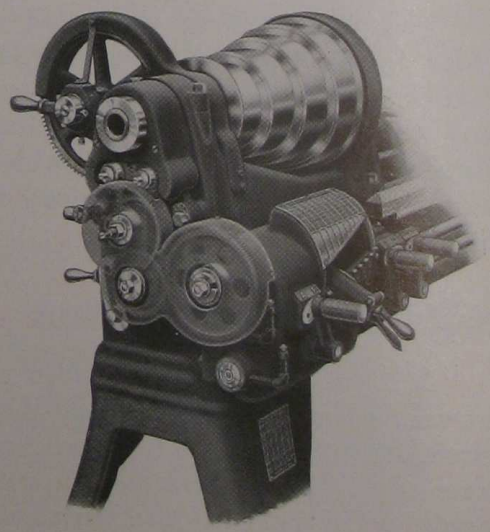
The method of conversion from the English to the metric range is very simple; in fact, the operation of this mechanism is so extremely simple that it is practically impossible to make a mistake in securing the desired pitch. There is absolutely no change made in the regular design of the lathe nor is there any complicated mechanism to apply, in order to secure the desired result. The only work incident to making the conversion is the replacing of the original gear on the stud, the intermediate gear and the driving gear on the quick change box with the proper transposing gears that are furnished to produce the required range of pitches.

After the three transposing gears have been applied to produce one metric pitch, all the other pitches shown on the index plate and enumerated on the following page can be secured by simply interchanging the gear on the stud with the particular gear shown by the index plate to be necessary for the desired pitch, and then setting the two compounding levers located at the left and right of the tumbler lever to the positions as indicated on the index plate.

After once applying the 127-tooth transposing gear to the box it is not removed until it again becomes necessary to cut English or Whitworth threads, when the original gear is replaced. All gear combinations incident to obtaining the entire range of metric pitches are calculated with tumbler lever in the first position as it is shown in accompanying illustration. Therefore, when cutting metric threads the position of this lever must not be changed.

In order that the screw-cutting mechanism may be properly set for cutting both metric and English threads, two index plates, one showing the combinations for metric and one for English pitches, are furnished with each lathe arranged for metric conversion.

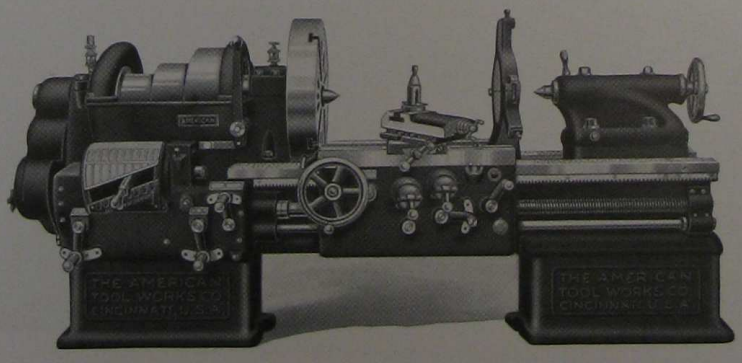
Special threads and pitches not included with the regular range can be obtained by the use of additional compounding gears. However, those regularly provided are considered sufficient for ordinary use.



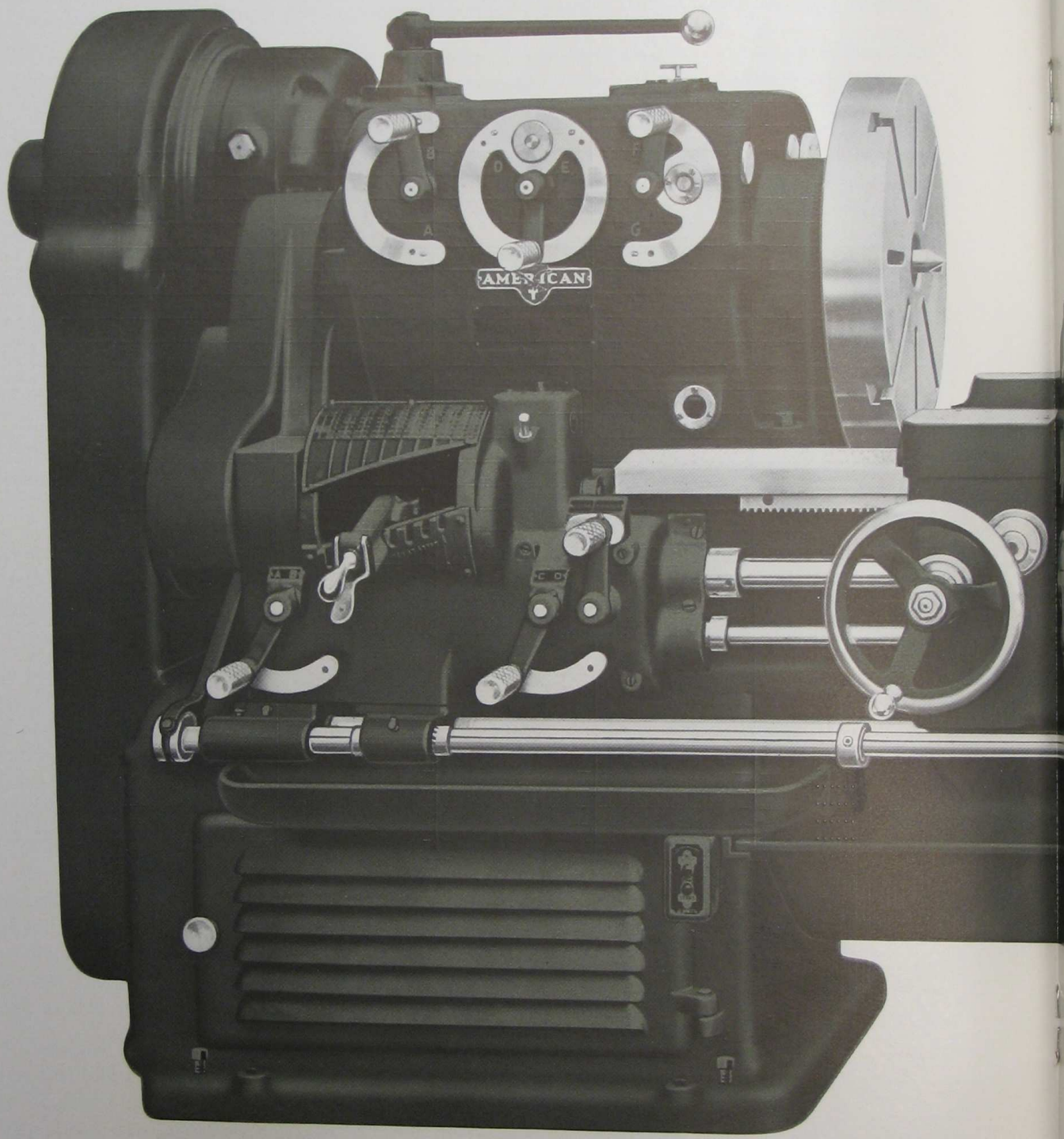
Metric transposing gears in place (Fig. No. 2)

STANDARD RANGE OF "CONVERTED" METRIC PITCHES

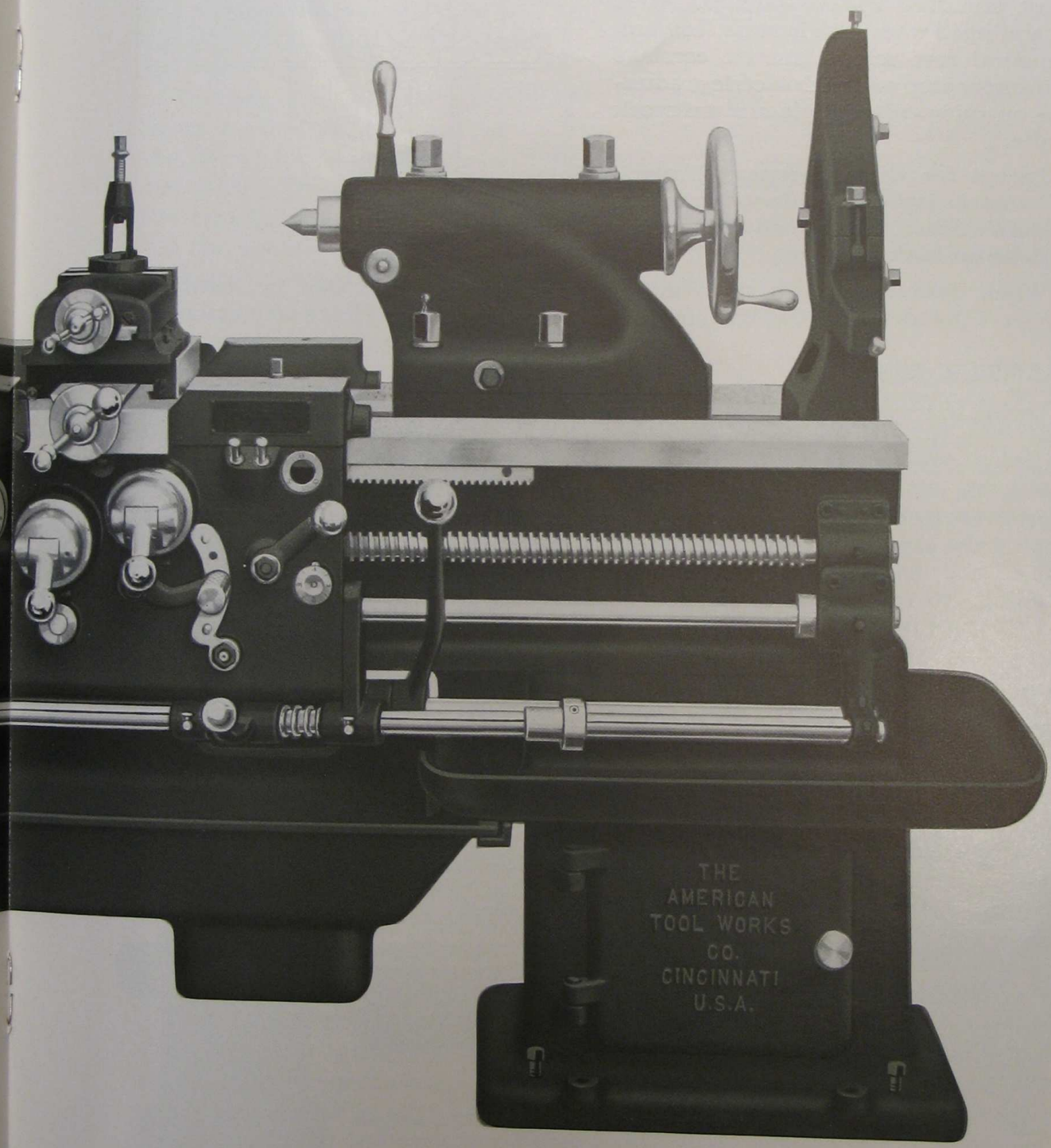
12-inch	14-inch	16-inch	18-inch	20-inch	22-inch
.5	.5	.5	.5	.5	.5
.5625	.5625	.5625	.5625	.5625	.5625
.625	.625	.625	.625	.625	.625
.6875	.6875	.6875	.6875	.6875	.6875
.75	.75	.75	.75	.75	.75
.8125	.8125	.8125	.8125	.8125	.8125
.875	.875	.875	.875	.875	.875
.9375	.9375	.9375	.9375	.9375	.9375
1.00	1.00	1.00	1.00	1.00	1.00
1.0625	1.0625	1.0625	1.0625	1.0625	1.0625
1.125	1.125	1.125	1.125	1.125	1.125
1.25	1.25	1.25	1.1875	1.1875	1.1875
1.375	1.375	1.375	1.25	1.25	1.25
1.5	1.5	1.5	1.375	1.375	1.375
1.625	1.625	1.625	1.5	1.5	1.5
1.75	1.75	1.75	1.625	1.625	1.625
1.875	1.875	1.875	1.75	1.75	1.75
2.00	2.00	2.00	1.875	1.875	1.875
2.125	2.125	2.125	2.00	2.00	2.00
2.25	2.25	2.25	2.125	2.125	2.125
2.50	2.5	2.5	2.25	2.25	2.25
2.75	2.75	2.75	2.375	2.375	2.375
3.00	3.00	3.00	2.5	2.5	2.5
3.25	3.25	3.25	2.75	2.75	2.75
3.50	3.5	3.5	3.00	3.00	3.00
3.75	3.75	3.75	3.25	3.25	3.25
4.00	4.00	4.00	3.5	3.5	3.5
4.25	4.25	4.25	3.75	3.75	3.75
4.50	4.5	4.5	4.00	4.00	4.00
5.00	5.00	5.00	4.25	4.25	4.25
5.5	5.5	5.5	4.5	4.5	4.5
6.00	6.00	6.00	4.75	4.75	4.75
6.5	6.5	6.5	5.00	5.00	5.00
7.00	7.00	7.00	5.5	5.5	5.5
7.5	7.5	7.5	6.00	6.00	6.00
8.00	8.00	8.00	6.5	6.5	6.5
8.5	8.5	8.50	7.00	7.00	7.00
9.00	9.00	9.00	7.5	7.5	7.5
.....	.....	.....	8.00	8.00	8.00
.....	.....	.....	8.5	8.5	8.5
.....	.....	.....	9.00	9.00	9.00
.....	.....	.....	9.5	9.5	9.5
.....	.....	.....	10.00	10.00	10.00



22-inch "American" lathe with double back geared head


AMERICAN

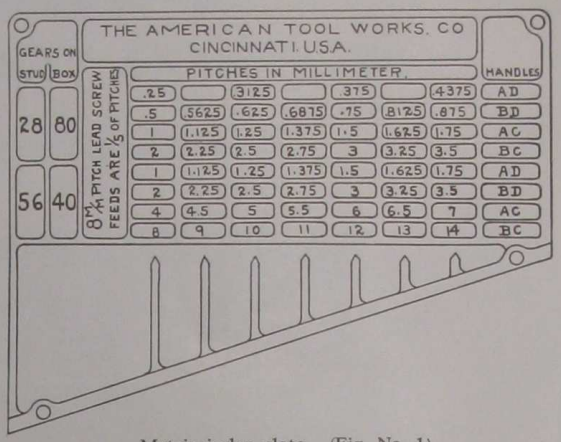
"AMERICAN"
PRECISION TOOL ROOM LATHES



METRIC LATHES

"American" Lathes can be furnished in all sizes as complete metric lathes. This type of lathe is equipped with metric pitch leadscrew and special gearing to cut standard metric pitches. It is also equipped with metric cross feed and compound rest screws, metric carriage micrometer stop and with metric graduations on micrometer dials and tailstock spindle.

Except for these changes, "American" metric lathes are identical to our standard lathes, all dimensions being the same on both types.

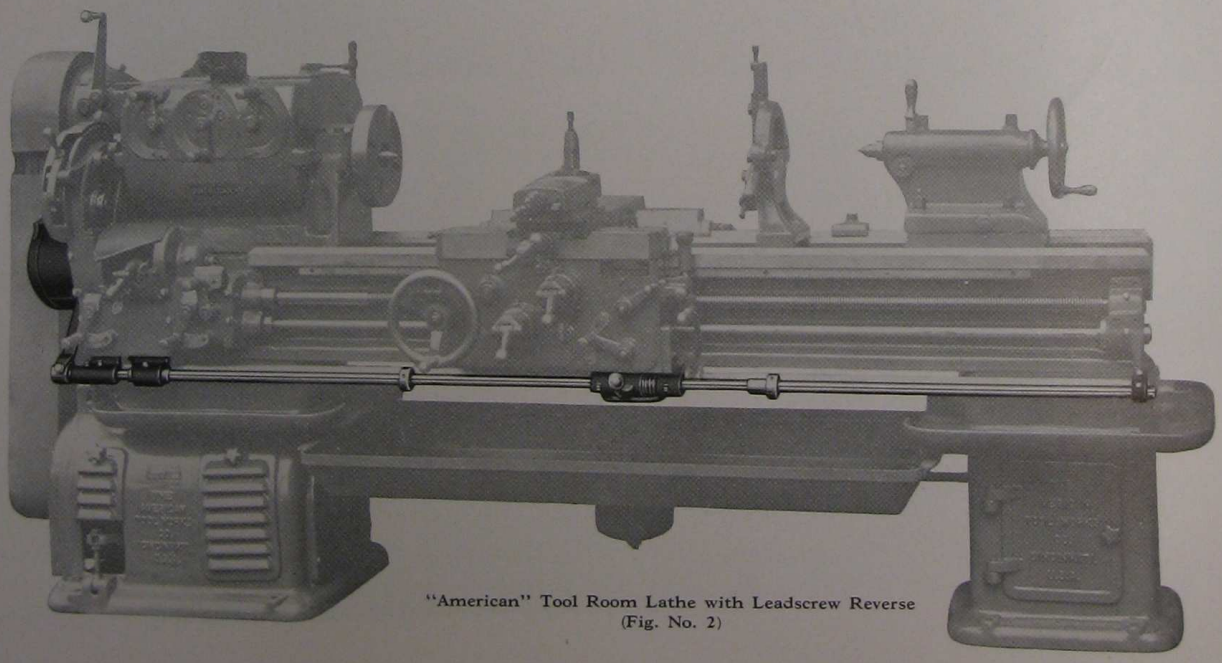


Metric index plate. (Fig. No. 1)

When desired, English or Whitworth transposing gears can be furnished to convert the metric thread and feed range to the English or Whitworth standard.

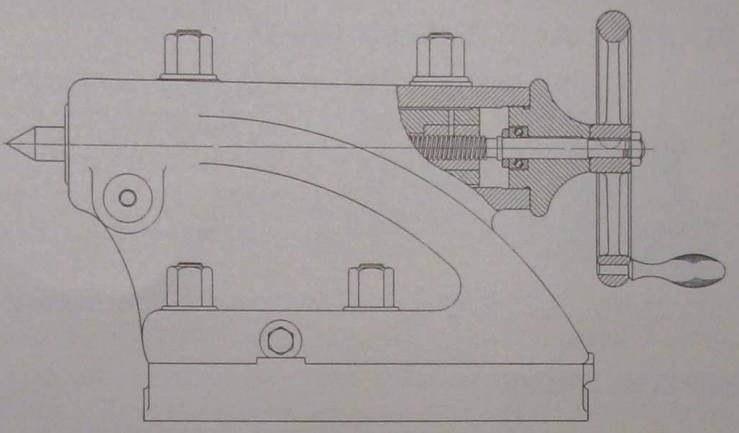
LEADSCREW REVERSE

Owing to its limited use, leadscrew reversing mechanism is furnished only upon order. This mechanism, by means of a double-faced single-tooth clutch, with its actuating elements controlled through a convenient lever located at the apron, reverses the rotary direction of the leadscrew and feed rod without changing the direction of the spindle rotation. Two stop collars are provided for automatically stopping the carriage travel in either direction, when threading or turning. The value of the leadscrew reverse lies in its reversal of the carriage travel, when threading, to return the carriage to the starting position without disengaging the half-nuts from the leadscrew.



"American" Tool Room Lathe with Leadscrew Reverse
(Fig. No. 2)

TAILSTOCK



Tailstock. (Fig. No. 1)

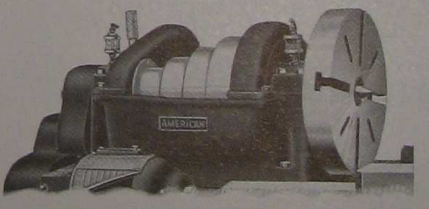
The tailstock has an extension barrel, giving clearance to carriage bridge for short work. Except the 12″ size which has three bolts, all tailstocks are provided with four clamping bolts for binding securely to the bed, the two rear bolts being carried to the top of the barrel for convenience in clamping. The barrel is solid, the spindle being clamped by a double plug binder which clamps without affecting the spindle alignment. The tailstock screw is provided with a ball thrust bearing for absorbing all thrusts.

COMPOUND REST

The compound rest is extremely rigid. 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.

SINGLE BACK GEARED HEAD

This type of head provides 8 spindle speeds, and is designed for a medium class of work. The cone steps are of large diameters and of wide face, thus insuring ample belt area. Four direct spindle speeds are afforded, and 4 reduced speeds. All shafts are of high-grade steel, accurately ground, and run in high quality phosphor bronze bearings having efficient oiling facilities. Sight-feed oilers are furnished on the spindle bearings. Spindle bearings are of the straight cylindrical type.

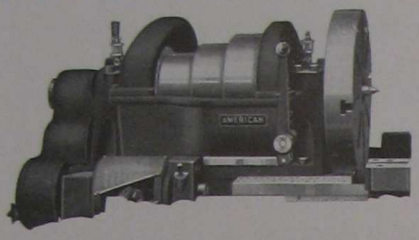


4-step cone, single back geared head. (Fig. No. 2)

DOUBLE BACK GEARED HEAD

"American" 3-step cone double back geared heads, because of their large diameter and wide face cone pulleys and high belt velocity, are unusually powerful. They are of the quick change, friction type, both the first and second back gear speeds being secured through a frictional connection between the back gear shaft and the gears. The advantage of this friction type of head lies in the fact that the change from one back gear range to the other can be made instantaneously,

DOUBLE BACK GEARED HEAD

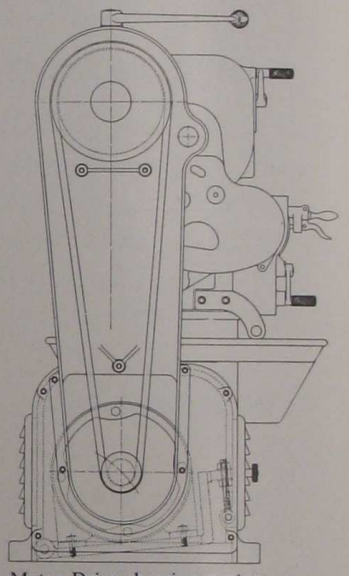


3-step cone, double back geared head. (Fig. No. 1)

without stopping the lathe, and in the convenient control for starting and stopping through the friction control lever at the front. The frictions used in these heads are exceptionally large and powerful and are self-compensating for wear. Back gear shaft and spindle run in high quality phosphor bronze bearings of straight cylindrical type.

MOTOR DRIVE

The standard type of motor drive consists of either A. C. or D. C., constant speed motor, mounted inside cabinet leg under headstock, and connected to initial driving unit of head, preferably by multiple vee belt, although a flat belt or silent chain may be used. Other types of motor mountings, such as belt, chain or gear connection to driving unit with motor mounted on headstock or on rear of the head-end cabinet leg, can be supplied when desired. All types of motor mountings include a hinged motor plate to permit motor adjustment to compensate for belt stretch. For the maximum horsepower motor recommended for each size lathe see pages 31 and 32.



Motor Drive showing motor adjustment. (Fig. No. 2)

GUARANTEE

If properly set up and leveled, "American" Tool Room Lathes are guaranteed to bore and turn true within the closest limits demanded by most exacting tool, jig and gauge work. The material entering into their construction is also guaranteed in every essential to be the very best obtainable for the purpose used. We further guarantee to repair any breakages or damage to the machine due to defective material or faulty workmanship.

STANDARD EQUIPMENT

Standard equipment, upon which base price is determined, includes compound and steady rests, thread dial, double friction countershaft for cone drives, large and small face plates and wrenches.

EXTRA EQUIPMENT

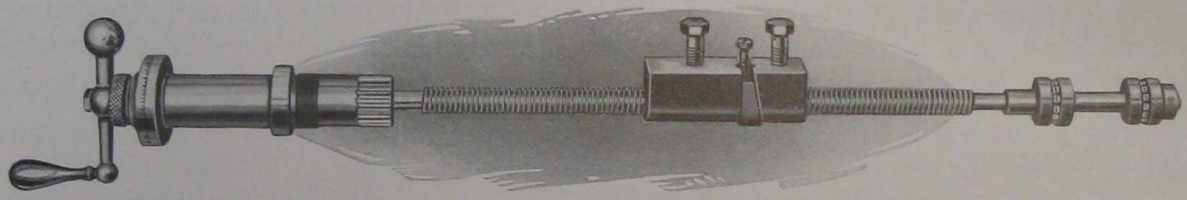
At extra cost we can equip these Lathes with improved Taper, Draw-In and Relieving Attachments, Turret on Carriage, Turret on Shears, Turret Tool Post, Special Tool Rests, Double Back Geared Head, "Patented" Geared Head for belt or motor drive, Electrical Apron Control, Countershaft for Geared Heads, Oil Pan, Oil Pump, Follow Rest, Extra Gears and Index Plates for special fine, coarse or metric threads.

"AMERICAN" TU-WAY TAPER ATTACHMENT

There are two distinct types of taper attachments, the yoke type and the telescopic screw type. Each has its advantages and disadvantages, consequently it has been a question in the buyer's mind which type possessed the greater merit.

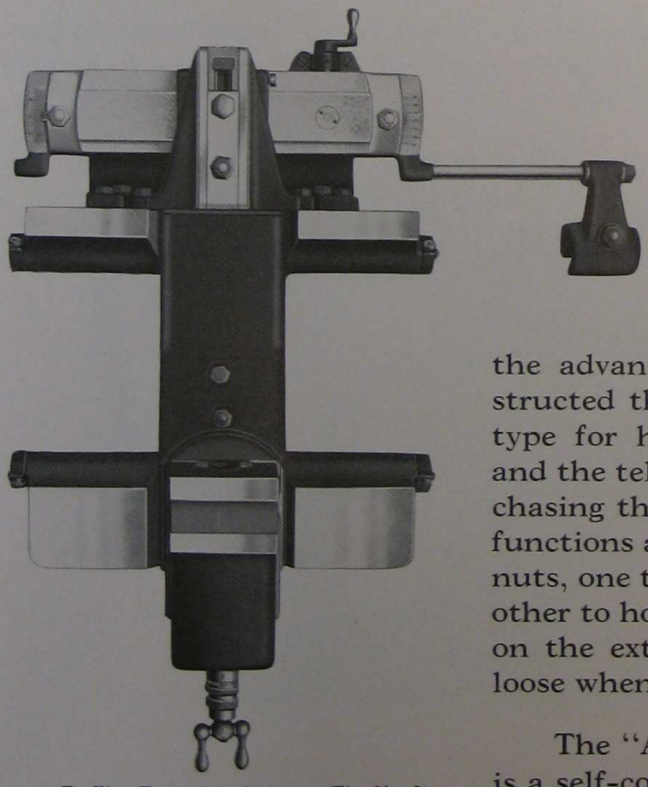
The new "American" Tu-Way Taper Attachment eliminates any doubt by combining the advantages of both types, and eliminating the disadvantages.

The advantage of the yoke type of taper attachment rests in the rigid connection between the bottom slide of the tool rest and the sliding shoe on the swivel bar, thus eliminating the pull of the taper from the cross-feed screw, and insuring for it longer life and greater accuracy. The disadvantage, on the other hand, is in the inability of the operator, when cutting taper threads or boring taper holes, to retain control of the cross-feed screw for additional depths of cut.



Telescopic Cross-Feed Screw and Compensating Nut. (Fig. No. 1)

On the telescopic screw type the condition is just the reverse. When chasing taper threads or boring taper holes the operator has complete control of the cross-feed screw, but on all taper turning the entire pull of the taper is thru the cross-feed screw, which naturally tends toward excessive wear, with its resultant backlash and inaccuracy.



Tu-Way Taper Attachment. (Fig. No. 2)

The "American" Tu - Way Taper Attachment combines all the advantages of both types, and is so constructed that either type may be used; the yoke type for heavy cuts and roughing operations and the telescopic screw type for finishing cuts, chasing threads and boring tapered holes. The functions are selectively controlled by two clamp nuts, one to clamp the yoke to tool rest, and the other to hold the screw journal in a fixed position on the extended rear guide bracket; one being loose when the other is tight.

The "American" Tu-Way Taper Attachment is a self-contained mechanism, carried as a unit

on the rear of the carriage, and so proportioned as to resist the severest stresses, and at the same time excessive weight and bulkiness are strictly avoided. Its convenience of operation recommends it highly to the production departments, where the time element is an important factor, while its unusually high degree of accuracy commends it to the tool room, where accuracy is a prime essential.

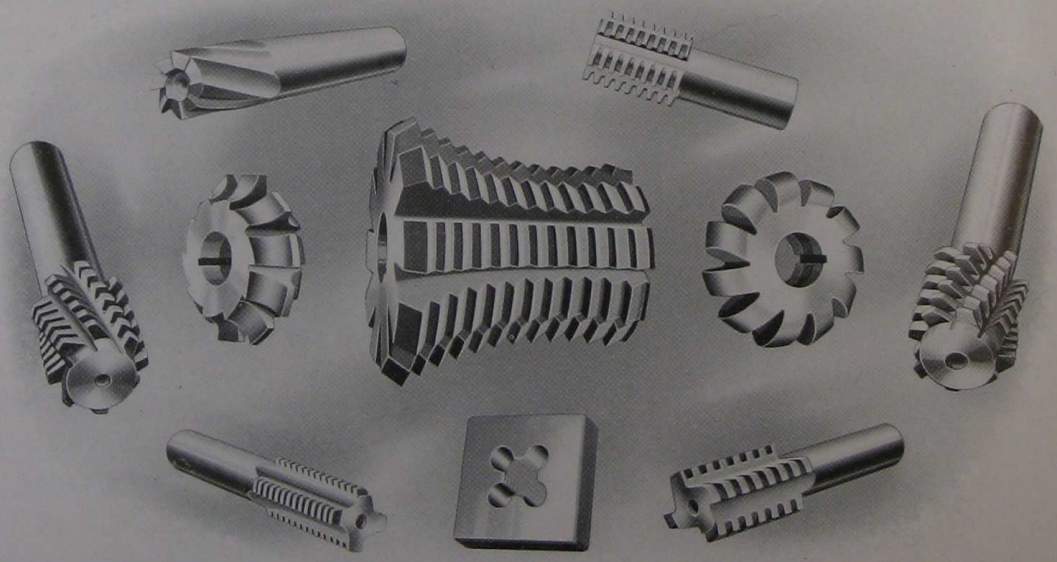
This mechanism can be quickly changed from taper to straight work, or vice versa, by simply loosening one nut and tightening another, while all other adjustments are proportionally simple.

RELIEVING ATTACHMENTS

Before entering into a description of this attachment, attention must be called to the fact that it is built in two types—the Plain and the Universal, each one being designed for certain classes of work; consequently on ordering an attachment of this kind, it is imperative that the characteristics of each type be thoroughly understood, in order that the proper equipment may be secured for the work.

The Plain Relieving Attachment, as its name suggests, is a simple mechanism, designed for external and internal cylindrical work only. Owing to its limited field of action, the plain attachment can be constructed of fewer and larger elements, producing, in consequence, a much more rigid and durable mechanism than the universal type, which must cover in its operation practically the entire field of relieving, including external, end and internal work.

The Universal Relieving Attachment, on the other hand, is designed to perform a great variety of work; in fact, it must be ready when called upon to handle



Examples of work produced by the universal relieving attachment

any kind of a relieving job. It is, therefore, of necessity a more complicated mechanism than the plain type, which is designed for one class of work only.

The "American" Universal Relieving Attachment, while it is exceptionally free from superfluous parts, nevertheless, owing to the wide field it must cover, has of necessity more sliding elements to wear, more adjustments to make, and less substantial parts to contend with than the plain attachment. It must, therefore, be expected that the Universal Attachment will demand care in handling and more intelligent operation to secure results.

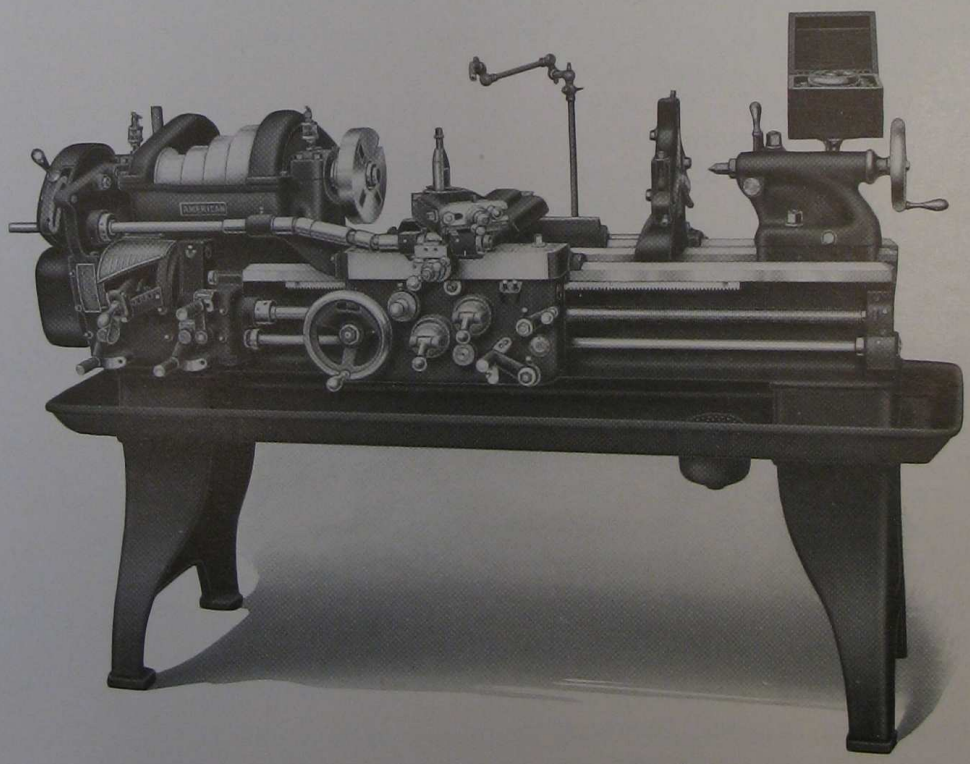
When relieving work such as hobs, taps, and cutters, the spindle speeds should be reduced to about half those regularly furnished.

In order to obtain this condition, on belt drives, the countershaft is fitted with an additional slow speed pulley, while on motor driven machines a two-speed motor is recommended for the most satisfactory operation of the attachment.

UNIVERSAL RELIEVING ATTACHMENT

The function of the Universal Relieving Attachment is to relieve or back off the flutes of rotary cutters, taps, reamers, end mills, hollow mills, dies, etc.

In order to accommodate the entire range of requirements, the new "American" Universal Relieving Attachment has been designed along original lines, resulting in a completely universal attachment, as will be evident from the fact



16-inch "American" tool room lathe equipped with universal relieving attachment.

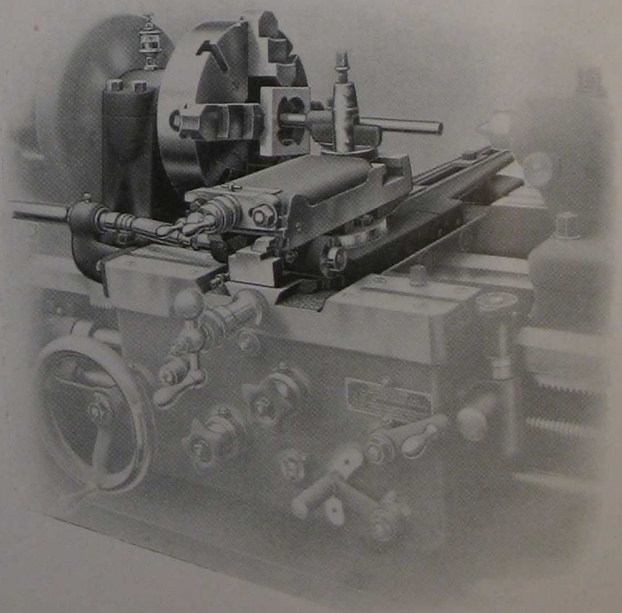
that end and internal relieving can be just as easily performed as straight relieving work, such as relieving cutters, taps and hobs.

In addition, this new design has eliminated the many objectionable features common to other makes, such as numerous shafts, mitre gears, racks, etc., and as a result the new "American" Universal Relieving Attachment is very simple and efficient in its design, only a few parts being used to accommodate a very wide range of work and to provide an unusually direct drive.

One of the important features of this new attachment is that it can be used with any type of "American" Tool Room Lathe. It can be as easily applied to and operated in connection with a geared head belt or motor driven lathe, as it can with a cone head lathe.

The change gear mechanism is supported by a bracket located at the front of the headstock on top of the quick change gear box. The gear train has a small quadrant which carries the change gears, and which is used to disengage the drive when not required. Power is taken from a spur gear located on the end of the spindle and is transmitted thru the change gear mechanism to the driving shaft, which extends thru the supporting bracket on the quick change gear box and is journaled at the other end in a suitable bracket fastened to the left wing of the carriage. Between this bracket and the tool rest are located the universal or knuckle joints which permit cross movement to the tool slide.

The driving shaft revolves constantly in one direction until the direction of the spindle rotation is reversed, at which time the driving shaft ceases to reciprocate the tool slide. This feature is of great value, for by means of it the tool slide will remain stationary when the direction of the carriage travel is reversed, while the half-nuts are engaged. By means of this same feature the tool can be withdrawn from the work and run back for a new cut, as is the practice in tap and hob making, without any waste motion of the parts and with absolute safety to the work. This feature alone represents a very important advance in the development of the Relieving Attachment, and greatly increases the efficiency of this mechanism.

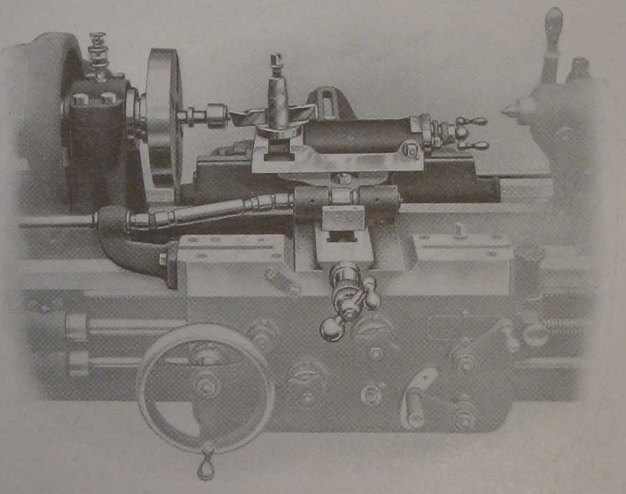


Internal relief

To obtain this condition a clutch connection is used between the cam and the driver which is

operative in one direction only, therefore, when the cam is set for operating in one direction, the reversal of the driving shaft will cause the clutch, which is held in engagement by a spring, to be withdrawn from the cam, with the result that the cam will remain stationary and consequently will impart no motion to the tool slide.

In order to obtain the entire range shown on the index plate, three cams, of one, two and four lobes, are provided in addition to the change gears. These cams run in an oil bath, are carried on the cam shaft which is located directly in front of the tool slide, and can be very readily interchanged when desired. It will be noted by reference to the index plate, that the most commonly used reliefs are obtained by making the slightest changes. Probably the most important and valuable feature of this new attachment is that which permits the tool slide to be operated at every 30 degrees, thus providing twelve (12) operating positions within a circle. It is this feature that permits relieving side cutters, end mills, and numerous jobs that heretofore could only be done by hand.



End relief

Very convenient means are provided on this attachment for obtaining the various degrees of relief for either external or internal work. The adjustment takes place at the front of the tool slide thru a thumbscrew, while a graduated scale indicates the depth of the relief as set.

As a further proof of the adaptability of this attachment, it can be applied and operated absolutely independently of the taper attachment. In other words, as far as the relieving attachment itself is concerned, a taper attachment is not required, except when taper work is to be handled.

A standard compound rest is furnished in addition to the special relieving rest, the use of which, for general turning purposes, we strongly recommend, for naturally the constant use of a precision tool for rough work will impair its accuracy, and unfit it for high-grade tool room work.

As the compound rest is readily interchangeable with the special tool slide of the relieving attachment, only a few moments are required to make the change.

When necessary to relieve taps or hobs having spiral flutes, the "American" Universal Relieving Attachment can be easily arranged to handle such work by the simple addition of extra gears.

The parts used in the construction of the "American" Universal Relieving Attachment are of the very best material for the service required. The cam yoke

UNIVERSAL RELIEVING ATTACHMENT

is forged. The cams, cam shoe and crank members are of tool steel, hardened and ground. The index bar in top slide is of forged steel, all the shafts and gears are well proportioned, and the entire mechanism is free from trappy construction.

One of the chief advantages of the "American" Relieving Attachment lies in the fact that any backlash in gears, cams, keyways or universal joints has no effect on the work, because the cam is located on the tool rest with a positive drive connection between the cam and the cutting tool. All gears are securely covered.

The "American" Universal Relieving Attachment can be applied to any current model "American" Lathe, up to and including 22" size, after the machine has left our factory, the application requiring only a slight amount of work by the purchaser.

Relieving Attachments—Plain and Universal Models

Size of Lathe		12"	14"	16"	18"	20"	22"
Maximum work diameter		3"	5"	6 1/8"	8"	9"	9"
Maximum Depth of Relief Obtainable	Univ'l	1/8"	1/8"	5/32"	3/16"	7/32"	7/32"
	Plain	7/16"	9/16"	9/16"	5/8"	5/8"	5/8"
Number of Cams Regularly supplied.	Univ'l	†3 fundamental cams, 1-2-4 lobes, with fixed drop only.					
	Plain	*3 Standard Cams, 1-2-4 lobes, 1/4" or 3/8" drop, other drops special to order.					
Number of flutes in work		2 3 4 5 6 7 8 9 10 11 12 14 16 18 20 22 24					
Weights of attachments		150	175	190	225	250	250

†Depths of relief are adjustable, using a fixed cam drop.

*Depths of relief are fixed. Must use separate cam for each variation in depth of relief. On 12", 14" and 16" lathes cams have 1/4" drop, on larger sizes cams have 3/8" drop, unless otherwise ordered.

PLAIN RELIEVING ATTACHMENT

The purpose of the Plain Relieving Attachment is to relieve the flutes of cutters, reamers, hobs, taps and internal work as dies, etc., where the work requires neither side, angular nor end relief.

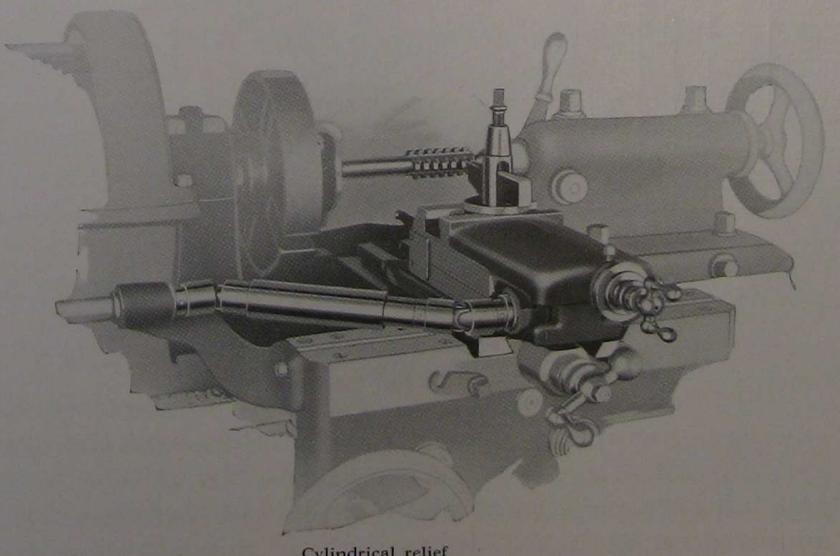
To secure an attachment capable of handling this work economically and on a manufacturing basis, the "American" Plain Relieving Attachment was designed with much more liberal proportions and with greater rigidity than the average relieving attachment. It consists primarily of a top and bottom slide and an

intermediate nut block controlled by a cam on the driving shaft. Backlash between the cam and tool has been absolutely eliminated, insuring an accurate reproduction of the cam contour, resulting in producing sharp edges on the work.

The cam operates against a hardened plate attached to the steel nut block mounted in a planed seat on the bottom slide, and is constructed so as to place the nut block and top slide screw in tension under the cutting stroke. The nut for the top slide screw is made of bronze and is attached to the top of the nut block, while the top slide screw connects the block with the top slide. At the inner end of the top slide is fastened a steel strap, to which is secured a tension spring bolt of sufficient dimensions to insure smooth operation and long service. One end of the tension spring bears against a lug on the bottom slide, while the other end bears against the head of the bolt.

Passing through the tension strap are two buffer rods which are attached to the nut block, their outer ends being supplied with large bushings which bear against rawhide cushions inserted in the bottom slide. The rods have lock nuts on the outer ends to provide the proper adjustment for the buffer bushes to suit any change in cam lobe height, or wear on the buffer cushions which absorb the shock and eliminate the noise.

Three cams are supplied with this attachment, which, together with the change gears, produce the entire range shown on the index plate. On this attachment the regular cam lobes are supplied with drops per table on page 26, and any desired rate of relief must be obtained by inserting another cam of the required drop. This is one of the principal points of difference between the plain and universal attachments, and on account of the elimination of the set-over yoke in top slide and the crank members, the results must be obtained through the cams. The tool steel cams having one, two and four lobes, are hardened and ground. The ends of cam hubs are provided with single tooth clutches which permit the driving shaft to be reversed in direction when returning the carriage for new cut, without moving tool slide during the return interval. A clutch sleeve on the driving shaft engages the clutch tooth on one end of the cam. The cam clutches are cut right and left, and this permits reversing the cam for internal work when



Cylindrical relief

spindle direction is reversed. The cam shaft can be easily removed for the changing of the cams.

The change gear mechanism is supported by a bracket located at the front of the headstock on top of the quick change gear box. The gear train has a small quadrant which carries the change gears, and which is used to disengage the drive when not required. Power is taken from a spur gear located on the end of the spindle and is transmitted thru the change gear mechanism to the driving shaft, which extends thru the supporting bracket on the quick change gear box and is journaled at the other end in a suitable bracket fastened to the left wing of the carriage. Between this bracket and the tool rest are located the universal or knuckle joints, which permit cross movement to the tool slide.

This attachment can be used independently of, or in conjunction with, the taper attachment, as the conditions may require.

The range of depths of relief possible on the plain attachment is as follows:
12″ Lathe .....0″ to $\frac{7}{16}$″ 14″ and 16″ Lathes.....0″ to $\frac{9}{16}$″
18″, 20″ and 22″ Lathes.....0″ to $\frac{5}{8}$″

SUB-HEAD

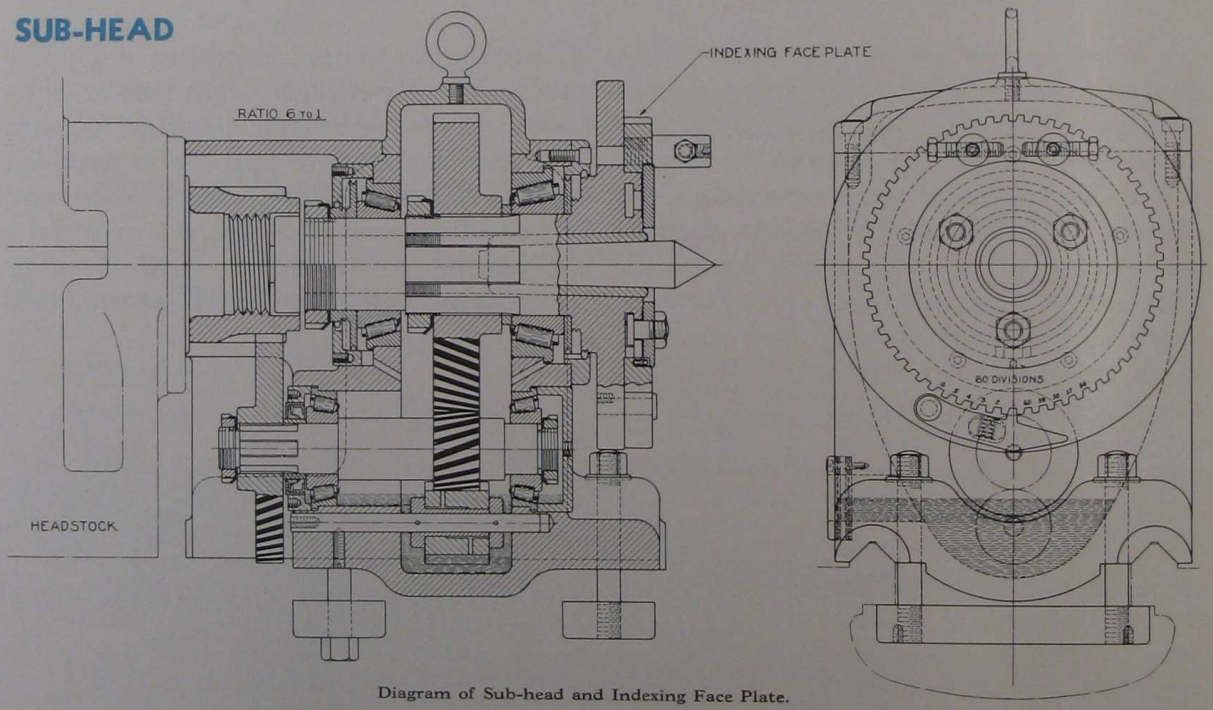


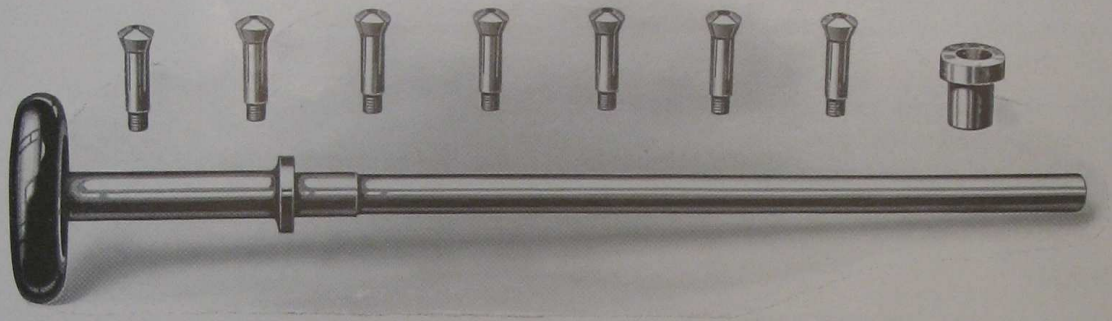
Diagram of Sub-head and Indexing Face Plate.

The Sub-Head or speed reducer, as it is sometimes called, is a valuable unit for relieving operations, coarse worm cutting and the chasing of long leads. This attachment which is fitted directly to the spindle nose and securely clamped to the bed provides a speed reduction of 6 to 1, resulting in the very slow work speeds required for such operations.

SUB-HEAD

This unit also functions as an indexing face plate, being suitably marked for the chasing of multiple threads. This entire unit is anti-friction mounted, is provided with accurately hobbed and machine-lapped helical gears, automatic lubrication, and may be quickly applied and removed as desired.

DRAW-IN ATTACHMENT (Tube Type)



Draw-in attachment and collet. (Fig. No. 1)

The Draw-in Attachment is a very simple mechanism, consisting of a long hollow steel bar, a hardened and ground steel taper bush and as many collets as are necessary for holding different diameters of work.

The hollow bar which extends thru the spindle has a wooden hand wheel at one end and is threaded internally at the other. The hardened and ground bush fits into the spindle nose and the collets are placed in this bush, the threaded end extending thru and being engaged by the thread chased on the inside of the bar. The stock which is to be turned, is passed thru the bar from the head end of the lathe, and is gripped in the collet or chuck. The turning of the hand wheel, in one direction or the other, causes the collet to either engage or disengage the work. Collets can be furnished for holding stock from the smallest fraction up to $\frac{7}{8}$" diameter on the 12", 14" and 16" sizes, and up to 1" diameter on the larger sizes.

NOSE-TYPE COLLET CHUCK

This attachment is a self-contained unit, secured to the spindle nose, and arranged to hold a series of collets with a capacity equal to diameter of spindle hole.

Nose-type collet chuck (Fig. No. 2)

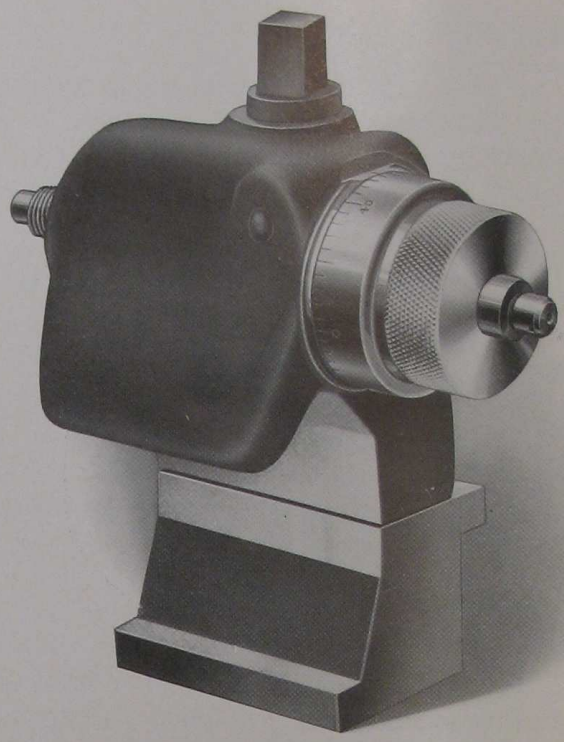
MICROMETER CARRIAGE STOP

The micrometer carriage stop furnished as an extra on the "American" Tool Room Lathe is provided for accurately locating the carriage or tool with relation to the work. It is a positive stop, which is used in connection with hand feed only, and must not be used in combination with power feed.

MICROMETER CARRIAGE STOP

This mechanism consists of a body casting carrying an adjusting screw with knurled knob, and a micrometer collar graduated for fine adjustments of the screw. A combination clamp permits the stop to be used on either front or rear Vee of bed, the clamp being reversed to fit the bed shape, while a binder screw secures the stop in place.

The stop screw can be used at either end, which permits placing the stop at any point on front or rear Vee, and at either end of carriage wings.

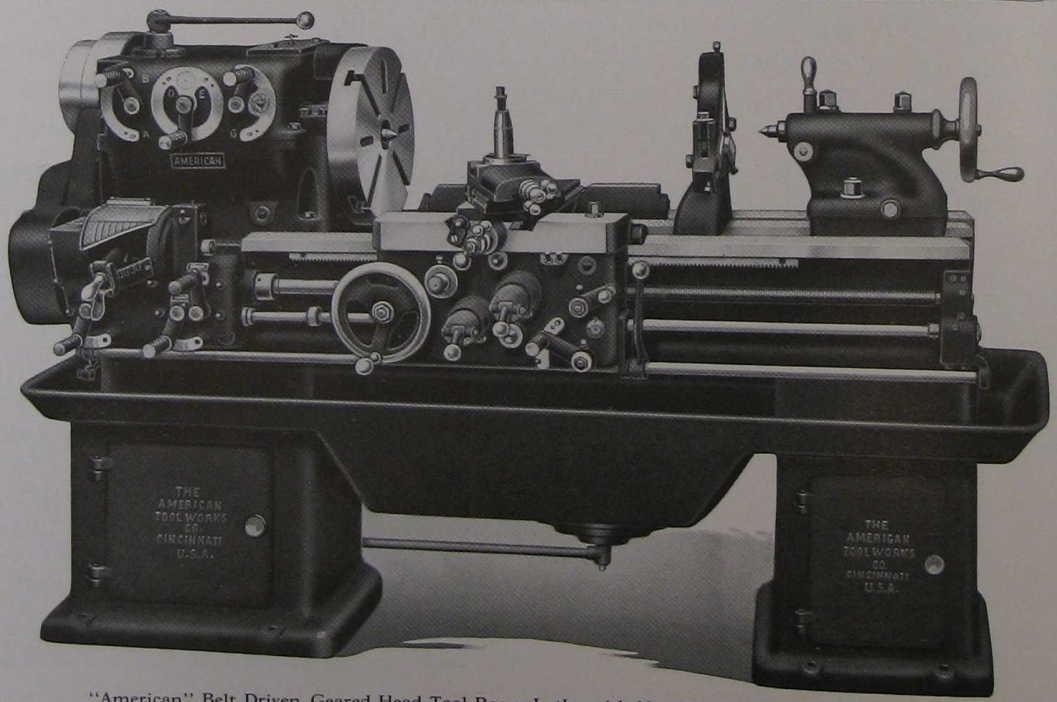


Micrometer carriage stop (Fig. No. 1)

OIL PAN

There is very little to be said in connection with the oil pan. It is a neat, well made sheet iron pan with sloping sides and beaded edges, its purpose being to catch the chips and waste cutting lubricant.

Size of Lathe	12″	14″	16″	18″	20″	22″
Weight of pan. Base length bed	107 lbs.	115 lbs.	180 lbs.	195 lbs.	297 lbs.	297 lbs.
Weight of pan 24″ (2 ft.) additional length	35 lbs.	38 lbs.	34 lbs.	41 lbs.	52 lbs.	52 lbs.



"American" Belt Driven Geared Head Tool Room Lathe with New Drop Type Oil Pan (Fig. No. 2)

SPECIFICATIONS

SPECIFICATIONS COMMON TO ALL LATHES REGARDLESS OF TYPE OF HEADSTOCK

SIZE OF LATHE		12-inch	14-inch	16-inch
Swing	Over bed	14 1/2"	16 1/2"	18 1/2"
	Over carriage bridge	9 1/2"	11 3/8"	12 1/8"
	Over taper attachment	8 1/4"	10 1/8"	10 3/8"
Distance Between Centers	Tailstock, flush (base machine)	30"	30"	30"
	Tailstock, overhung (base machine)	33"	33 1/2"	33 1/2"
Quick Change Gear Box	Range of threads per inch	2 to 112	2 to 112	2 to 112
	Range of feeds per inch (number of cuts)	8 to 448	8 to 448	8 to 448
	Range of feeds per spindle revolution	.002" to .125"	.002" to .125"	.002" to .125"
	Number of thread and feed changes	48	48	48
Tailstock	Length of base	12"	13"	14"
	Spindle, diameter	2"	2 3/16"	2 1/16"
	Spindle, travel	5 3/4"	6 1/2"	7 1/4"
Carriage	Length	17 1/2"	18 5/8"	22 1/8"
	Bridge width	5 1/2"	6 1/8"	7 1/8"
Spindle hole, diameter		1 13/64"	1 13/64"	1 13/64"
Centers, Morse taper		No. 3	No. 3	No. 4
Leadscrew, diameter and threads per inch		1 1/8"—6 Thd.	1 1/4"—4 Thd	1 3/8"—4 Thd.
Steady rest, capacity, maximum standard		4"	5"	6"
Follow rest, capacity		3"	3"	3 3/4"
Compound rest, top slide travel		3"	4"	5 1/4"
Large face plate, diameter		12 1/2"	15"	17"
Tool post, takes tool with shank (maximum size)		1/2" x 1"	1/2" x 1"	5/8" x 1 1/4"

SPECIFICATIONS FOR 12-SPEED GEARED HEAD LATHES ONLY

			12-inch	14-inch	16-inch
Motor	Largest motor recommended	H. P.	7 1/2	10	10
Spindle	Front bearing, taper diameter x length		2 5/8" to 3 1/4" x 3 7/8"	3" to 3 5/8" x 4"	3 3/8" to 4 1/16" x 4 3/4"
	Rear bearing, taper diameter x length		2 1/16" to 2 11/16" x 2 9/16"	2 5/8" to 3" x 2 9/16"	3 1/8" to 3 5/8" x 3 1/2"
	Nose diameter and threads per inch (threaded type)		2 3/8"—6 Thd.	2 3/8"—6 Thd.	2 3/4"—4 Thd.
	Flange diameter (flange type)		6 1/4"	8 1/4"	8 1/4"
Driven Pulley	Diameter and face		10 3/4" x 2 3/4"	10 3/4" x 3 1/4"	10 3/4" x 4 1/4"
	Speed R. P. M.		340	370	370
Spindle Speeds	Normal range—sleeve bearing spindle		12 to 450	10 to 397	10 to 354
	Normal range—Timken bearing spindle		19 to 725	17 to 675	17 to 580
Weight—Belt Drive	Net (base machine)	pounds	1750	2300	2850
	Crated (base machine)	pounds	2050	2650	3250
	Boxed (base machine)	pounds	2650	3400	3900
Weight—Motor Drive	Net (base machine)	pounds	2400	3000	3700
	Crated (base machine)	pounds	2700	3350	4100
	Boxed (base machine)	pounds	3400	4200	5000
Weight, each additional 24" between centers		pounds	170	220	275
Cubic Feet	Shipped Knocked Down — Base machine, boxed		78	94	110
	Shipped Knocked Down — Each additional 24" between centers		21	23	26
	Shipped Assembled — Base machine, boxed		130	165	180
	Shipped Assembled — Each additional 24" between centers		34	38	42

SPECIFICATIONS FOR DOUBLE BACK GEARED CONE PULLEY LATHES ONLY

			12-inch	14-inch	16-inch
Spindle	Front bearing, cylindrical type (diameter x length)		2 3/8" x 3 3/4"	2 3/4" x 4"	3" x 5"
	Rear bearing (diameter x length)		1 13/16" x 2 3/4"	2 1/16" x 3"	2 1/16" x 3 13/16"
	Nose diameter and threads per inch (threaded type)		2 3/8"—6 Thd.	2 3/8"—6 Thd.	2 3/8"—6 Thd.
	Flange diameter (flanged type)		6 1/4"	8 1/4"	8 1/4"
Cone Pulley	Number of steps		3	3	3
	Width of each step		2 5/8"	3 1/8"	3 11/16"
	Diameters, maximum and minimum		9"—5 7/8"	10 1/2"—7 1/16"	13"—8 5/8"
Back gear ratios			3.54:1 & 12.7:1	3.29:1 & 11:1	3.44:1 & 11.73:1
Range of spindle speeds (normal)			13.5 to 405	16.3 to 400	14.3 to 380
Weight	Net (base machine)	pounds	1500	2100	2600
	Crated (base machine)	pounds	1750	2350	2950
	Boxed (base machine)	pounds	2300	2975	3600
	Each additional 24" between centers	pounds	170	220	275
Cubic Feet	Shipped Knocked Down — Base machine, boxed		67	88	96
	Shipped Knocked Down — Each additional 24" between centers		18	22	24
	Shipped Assembled — Base machine, boxed		120	140	162
	Shipped Assembled — Each additional 24" between centers		30	35	37

SPECIFICATIONS FOR SINGLE BACK GEARED CONE PULLEY LATHES ONLY

			12-inch	14-inch	16-inch
Spindle	Front bearing, cylindrical type (diameter x length)		2 3/8" x 3 3/4"	2 3/4" x 4"	3" x 5"
	Rear bearing (diameter x length)		1 13/16" x 2 3/4"	2 1/16" x 3"	2 1/16" x 3 13/16"
	Nose diameter and threads per inch (threaded type)		2 3/8"—6 Thd.	2 3/8"—6 Thd.	2 3/8"—6 Thd.
	Flange diameter (flanged type)		6 1/4"	8 1/4"	8 1/4"
Cone Pulley	Number of steps		4	4	4
	Width of each step		2 3/8"	2 5/8"	3 1/8"
	Diameters, maximum and minimum		9"—4 1/16"	10 1/2"—5 1/4"	13"—6.4
Range of spindle speeds, normal			11.3 to 436	10 to 400	8.8 to 380
Back gear ratio			8.1:1	10:1	10.44:1
Weight	Net (base machine)	pounds	1500	2100	2600
	Crated (base machine)	pounds	1750	2350	2950
	Boxed (base machine)	pounds	2300	2975	3600
	Each additional 24" between centers	pounds	170	220	275
Cubic Feet	Shipped Knocked Down — Base machine, boxed		67	88	96
	Shipped Knocked Down — Each additional 24" between centers		18	22	24
	Shipped Assembled — Base machine, boxed		120	140	162
	Shipped Assembled — Each additional 24" between centers		30	35	37

SPECIFICATIONS

SPECIFICATIONS COMMON TO ALL LATHES REGARDLESS OF TYPE OF HEADSTOCK

SIZE OF LATHE		18-inch	20-inch	22-inch
Swing	Over bed	20 1/2"	22 1/2"	24 1/2"
	Over carriage bridge	13 1/4"	14 1/2"	17 3/8"
	Over taper attachment	11 1/4"	12 7/8"	15 3/4"
Distance Between Centers	Tailstock, flush (base machine)	30"	48"	48"
	Tailstock, overhung (base machine)	34"	52 1/2"	52 1/2"
Quick Change Gear Box	Range of threads per inch	1 to 56	1 to 56	1 to 56
	Range of feeds per inch (number of cuts)	8 to 448	8 to 448	8 to 448
	Range of feeds per spindle revolution	.002" to .125"	.002" to .125"	.002" to .125"
	Number of thread and feed changes	48	48	48
Tailstock	Length of base	16"	19"	19"
	Spindle, diameter	2 7/8"	3 3/16"	3 3/16"
	Spindle, travel	9"	12"	12"
Carriage	Length	25"	27"	27"
	Bridge width	8 1/8"	9 1/8"	9 1/8"
Spindle hole, diameter		1 9/16"	1 3/4"	1 3/4"
Centers, Morse taper		No. 4	No. 4	No. 4
Leadscrew, diameter and threads per inch		1 5/8"—2 Thd.	1 3/4"—2 Thd.	1 3/4"—2 Thd.
Steady rest, capacity, maximum standard		7"	8"	8"
Follow rest, capacity		4 1/4"	4 3/4"	4 3/4"
Compound rest, top slide travel		6"	7 1/4"	7 1/4"
Large face plate, diameter		19"	21"	21"
Tool post, takes tool with shank (maximum size)		3/4" x 1 1/2"	3/4" x 1 1/2"	3/4" x 1 1/2"

SPECIFICATIONS FOR 12-SPEED GEARED HEAD LATHES ONLY

Motor	Largest Motor recommended ..... H P.	15	20	20
Spindle	Front bearing, taper diameter x length	3 13/16" to 4 5/8" x 5 1/4"	4 1/4" to 5 1/8" x 5 7/8"	4 1/4" to 5 1/8" x 5 7/8"
	Rear bearing, taper diameter x length	3 5/16" to 3 3/4" x 3 1/4"	3 5/8" to 4 1/8" x 3 1/16"	3 5/8" to 4 1/8" x 3 1/16"
	Nose diameter and threads per inch (threaded type)	3"—4 Thd.	3 5/8"—3 Thd.	3 5/8"—3 Thd.
	Flanged diameter (flanged type)	8 1/4"	8 1/4"	8 1/4"
Driven Pulley	Diameter and face	15" x 5 3/8"	15" x 5 3/8"	15" x 5 3/8"
	Speed R. P. M.	350	340	340
Spindle Speeds	Normal range—sleeve bearing spindle	8 to 342	8 to 320	8 to 320
	Normal range—Timken bearing spindle	13 to 550	13 to 500	13 to 500
Weight—Belt Drive	Net (base machine) ..... pounds	3950	5400	5500
	Crated (base machine) ..... pounds	4350	5800	5900
	Boxed (base machine) ..... pounds	5200	7200	7300
Weight—Motor Drive	Net (base machine) ..... pounds	5100	6500	6600
	Crated (base machine) ..... pounds	5650	7000	7100
	Boxed (base machine) ..... pounds	6500	8500	8600
Weight, each additional 24" between centers ..... pounds		325	400	400
Cubic Feet	Shipped Knocked Down — Base machine, boxed	128	207	225
	Shipped Knocked Down — Each additional 24" between centers	30	45	45
	Shipped Assembled — Base machine, boxed	200	260	278
	Shipped Assembled — Each additional 24" between centers	46	48	48

SPECIFICATIONS FOR DOUBLE BACK GEARED CONE PULLEY LATHES ONLY

Spindle	Front bearing, cylindrical type (diameter x length)	3 1/4" x 5 1/2"	3 3/4" x 6 1/8"	3 3/4" x 6 1/8"
	Rear bearing (diameter x length)	2 3/8" x 3 3/4"	2 3/4" x 4 9/16"	2 3/4" x 4 9/16"
	Nose diameter and threads per inch (threaded type)	2 3/4"—4 Thd.	3"—4 Thd.	3"—4 Thd.
	Flange diameter (flanged type)	8 1/4"	8 1/4"	8 1/4"
Cone Pulley	Number of steps	3	3	3
	Width of each step	4 1/8"	4 5/8"	4 5/8"
	Diameters, maximum and minimum	14 1/2" x 9 1/2"	16"—10 1/2"	16"—10 1/2"
Back gear ratios		3.465:1 & 12.08:1	3.5:1 & 12.55:1	3.5:1 & 12.55:1
Range of spindle speeds (normal)		12.7 to 352	11.5 to 335	11.5 to 335
Weight	Net (base machine) ..... pounds	3500	5000	5100
	Crated (base machine) ..... pounds	3900	5450	5550
	Boxed (base machine) ..... pounds	4700	6500	6600
	Each additional 24" between centers ..... pounds	325	400	400
Cubic Feet	Shipped Knocked Down — Base machine, boxed	122	196	200
	Shipped Knocked Down — Each additional 24" between centers	27	30	30
	Shipped Assembled — Base machine, boxed	194	230	240
	Shipped Assembled — Each additional 24" between centers	40	45	45

SPECIFICATIONS FOR SINGLE BACK GEARED CONE PULLEY LATHES ONLY

Spindle	Front bearing, cylindrical type (diameter x length)	3 1/4" x 5 1/2"		
	Rear bearing (diameter x length)	2 3/8" x 3 3/4"		
	Nose diameter and threads per inch (threaded type)	2 3/4"—4 Thd.		
	Flange diameter (flanged type)	8 1/4"		
Cone Pulley	Number of steps	4		
	Width of each step	3 1/2"		
	Diameters, maximum and minimum	14 1/2"—7"		
Range of spindle speeds (normal)		6.72 to 348		
Back gear ratio		12:1		
Weight	Net (base machine) ..... pounds	3500		
	Crated (base machine) ..... pounds	3900		
	Boxed (base machine) ..... pounds	4700		
	Each additional 24" between centers ..... pounds	325		
Cubic Feet	Shipped Knocked Down — Base machine, boxed	122		
	Shipped Knocked Down — Each additional 24" between centers	27		
	Shipped Assembled — Base machine, boxed	194		
	Shipped Assembled — Each additional 24" between centers	40		

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