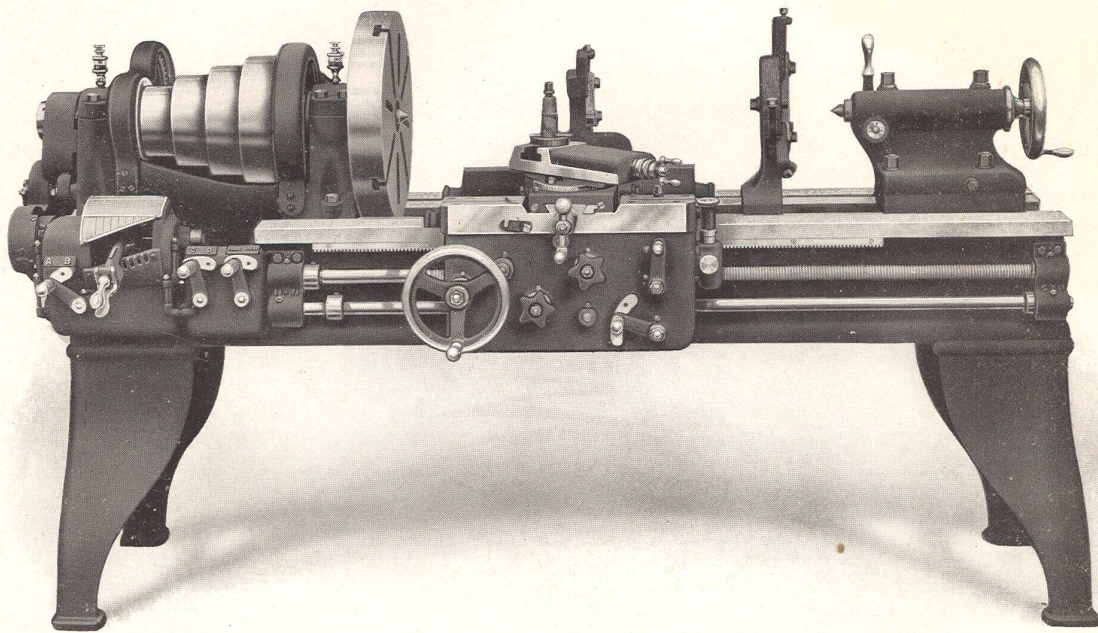


"AMERICAN" HIGH DUTY LATHES



In the following description attention is directed to the more important and essential characteristics of the new model "American" High Duty Lathes which represent a very considerable advance in the construction of the engine lathe. The features described herein will therefor merit the most careful consideration, for a thorough understanding of the many improvements of this new design will show that neither expense nor intelligent effort has been spared in its development. We confidently claim that this new machine is superior to any lathe now on the market; and with good reason, for its design is unquestionably superior to that of any other, as will be obvious from an unbiased examination, and its workmanship in all respects is fully guaranteed to be the very best that skilled mechanics and modern shop methods can produce.

THE AMERICAN TOOL WORKS CO.
LATHES, PLANERS, SHAPERS, RADIAL DRILLS.

MAIN OFFICES AND WORKS.
CINCINNATI, U. S. A.

THE AMERICAN TOOL WORKS COMPANY

HIGH DUTY LATHES

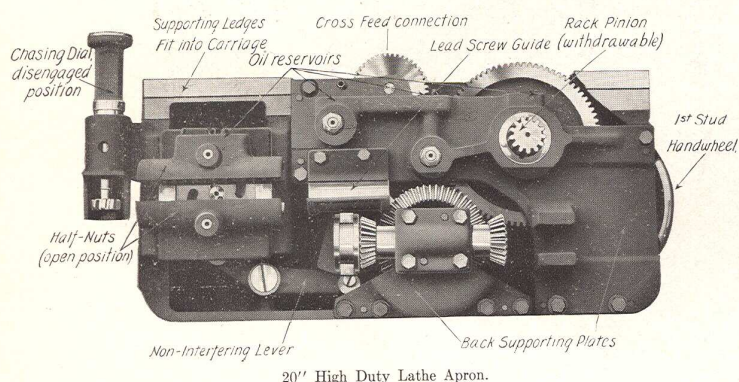
The bed construction.—The bed is ribbed transversely with heavy double walled cross girths spaced 2' apart. A rib is also carried lengthwise in the center of the bed. On the 24" Heavy Pattern and larger sizes, a rack is cast integral with the center rib and the tailstock is provided with a pawl which engages this rack for resisting the end thrust when heavy work is being turned.

The carriage vees are chilled on all sizes up to 24" Medium Pattern inclusive, thus providing a harder metal on the shears than on the carriage bearings, consequently the wear will be largely confined to the carriage where it will not impair the accuracy or alignment of the machine. On larger sizes this same result is accomplished by making the bed casting of semi-steel which provides a hard, close grained metal for the vee bearings as well as giving additional strength and rigidity.

The carriage shears on all sizes are wider and the bearings longer than are usually provided on other makes. The bridge has also been widened and is of unusually great depth by reason of the patented drop vee bed construction. On the 30" size and upwards the carriage bridge also has a bearing on the front tailstock "vee."

The compound rest is of a very rigid design, the swivel being made completely circular and is graduated in degrees. On the 18" and larger sizes it is clamped to the cross slide by means of four bolts. Full length taper gibs having end screw adjustment are also provided on both the cross and compound rest slides. These gibs are placed on the right hand side where they will not receive the thrust of the tool under ordinary working conditions.

The tailstock is of our improved four bolt design, except on the 14" size, with the rear bolts carried to the top for convenience in clamping. The tailstock spindle is clamped in position by means of a double plug binder which is so constructed as to securely clamp the spindle at any position without possibility of throwing it out of alignment.



20" High Duty Lathe Apron.

The spindle is made of a special .075 carbon hammered crucible steel spindle stock, and all other shafts, including the lead screw, are made of a .045 carbon special ground stock.

The spindle bearings are equipped with sight feed oil cups, and all other important bearings are oiled by means of our improved gravity oiling system;—the oil being carried to the bearings through oil pipes conspicuously located, which hold a generous supply of oil.

The spindle thrust bearing of the 30" and larger sizes consist of five collars, alternately of bronze and hardened and ground steel. The bronze collars are provided with oil grooves.

Renewable bronze bushed bearings are furnished throughout the machine, and the loose gears in the apron are also lined with bronze; the studs on which they run being case-hardened and ground, thus providing a hard bearing surface without impairing their strength.

The apron of the 20" and larger sizes is made in a complete double wall or box section, giving all studs and shafts a double bearing. The aprons of the smaller sizes are of the semi-box type, and all important studs and shafts are also provided with an out-board support. The rack pinions of the 20" and larger sizes can be withdrawn from the rack when cutting threads, thus obviating the possibility of "chatter" or vibration when cutting coarse pitch screws.

A separate feed rod, in addition to the lead screw is furnished on all sizes up to and including the 27". The mechanism is so arranged that when either the lead screw or feed rod is in use, the other is disengaged. In other words, when the feed rod is being used, the lead screw is at rest and visa versa. These members are engaged and disengaged by means of the lever at the extreme right-hand end of the quick change gear box. The apron mechanism is also arranged so that the half nuts are locked out when the rod feed is in use or visa versa.

A **thread dial** is regularly furnished, thus obviating the necessity of using a backing belt or a reversing motor for thread cutting. The thread dial is placed at the right of the apron and can be readily disengaged from the lead screw when not in use.

The **lead screw** is made from .045 carbon ground lead screw stock. The threads are cut to a guaranteed accuracy limit of .001" per foot. These screws are unusually large in diameter and the threads are of a very coarse pitch—the 14" and 16" being 4 per inch single thread,—the 18" 20" 24" and 27" are 2 per inch single thread,—and the larger sizes one per inch single thread. These screws are chased by means of a special lead screw made with a Brown & Sharpe master screw which is 4" in diameter.

The **1" pitch lead screw** used on the larger sized lathes permits engaging the half nuts at any point when chasing any threads excepting those having a fractional pitch. On the 18" to 27" inclusive the half nuts may be engaged at any points when chasing screws having an even number of threads per inch.

The **coarse pitch lead screw** and the comparatively low apron ratio required provides the **further great advantage of obviating the necessity of speeding up through the quick change gear mechanism for the coarser pitches and feeds.** As a matter of fact, no member of the quick change mechanism does at any time run faster than the initial driving shaft, and the compounding gears are therefore only used for cutting the finer threads and feeds. Consequently, a very direct transmission is provided for heavy turning, etc.

An **automatic stop** is regularly provided on the 14" to 27" sizes inclusive, for disengaging the longitudinal feed at any predetermined point. The automatic stop can also be furnished at an extra charge on the 30", 36" and 42" sizes.

Steel gearing:—All gears in the entire quick change gear mechanism are regularly made from .045 carbon bar steel. The apron gearing is also made of the same material with exception of two large gears which are made from steel castings.

The **cone gears** of the quick change gear mechanism are cut with the improved Brown & Sharpe 20 degree involute cutters which form a pointed tooth slightly rounded at the top. This is the only proper and satisfactory form of tooth for use in a tumbler gear mechanism, as it permits instantaneous engagement of the gears without clashing. The pointed tooth also has a wider and a stronger section than the 14½ degree tooth.

The **tumbler lever** of the quick change mechanism is cast steel and is bronze bushed. It is guided into its respective positions by means of a slotted plate attached to the front of the box. Consequently, the gears can not be engaged before they are in their proper position for meshing.

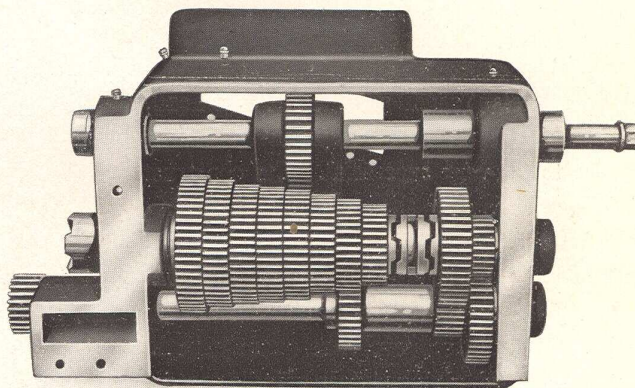
The **quick change gear mechanism** forms a complete unit in itself and is mounted on the front of the machine, being fixed to the bed by means of a tongue and groove which insures permanently accurate alignment. This mechanism is much more easily accessible for any necessary attention than where it is incorporated in the bed under the headstock.

The **feed compounding** is done by means of taper jaw clutches which may be easily engaged. This construction is undoubtedly superior to that used on other designs which have a compound mechanism of the tumbler gear type bolted on the end of the bed.

All loose gears in the quick change mechanism are bronze bushed.

The **auxiliary quadrant.** While these new pattern lathes are provided with an unusually wide range of thread and feed changes, provision for applying extra gears is also made by means of an auxiliary quadrant on the end of the bed; thus enabling the use or application of such extra change gears as will be necessary to cut all special or metric threads not regularly furnished with the standard equipment.

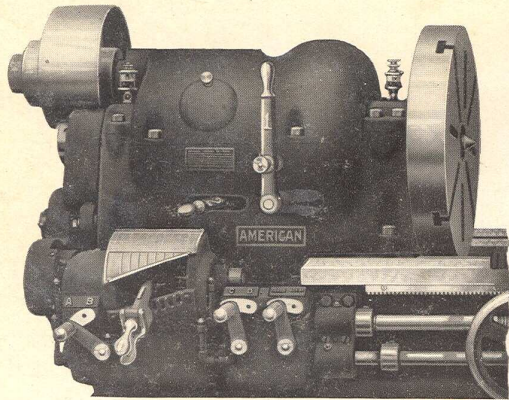
Guaranteed accuracy.—With regard to the accuracy of these lathes, we will guarantee that if properly set up and levelled, they will bore or turn true within .001" per foot. The material entering into their construction is also guaranteed in every respect to be the very best procurable for the purposes used. We will further guarantee to replace any breakages or damage to the machine due to defective material or faulty workmanship.



Interior of the Quick Change Gear Box.

HEADSTOCKS.

The cone pulley drive.—The Four Step Cone, Single Back Geared Head is furnished as a standard equipment on all sizes from the 14" to the 36" Medium Pattern inclusive. On the 36" and 42" Heavy Pattern Lathes, the standard style of drive is the Four Step Cone, Triple Geared, Face Plate Drive. This latter style of head can also be furnished on the 30" and 36" Medium Pattern Lathes.



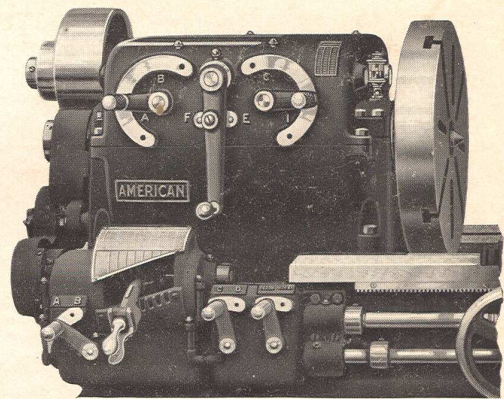
4 Speed Patented Geared Head.

Three step cone double back geared head can be furnished on all sizes from the 14" to the 36" Medium Pattern inclusive. On this style of head, a lever is provided which extends to the front of the head, by means of which the operation of the double back gear mechanism is greatly facilitated.

The four speed patented geared head, belt or motor driven. This style of drive can be furnished on all sizes from the 14" to 36" Medium Pattern inclusive. This head provides the simplest geared drive ever designed, only seven (7) gears and two shafts being used in its construction. It is operated in connection with a triple friction countershaft and provides either eight (8) forward and four (4) reverse speeds or twelve (12) forward speeds. This head also provides an ideal form of drive when used in connection with a variable speed motor.

The eight speed patented geared head, belt or motor driven. This is a recent development in "American" lathes and has proven to be very successful. Its construction is very simple and efficient as only three shafts and eleven gears are used to obtain the eight speed changes. This head, when belt driven, is operated in connection with a double friction countershaft. As a thread dial is regularly furnished with the machine, a "backing" belt need not be used, and consequently, both countershaft speeds may be forward, giving sixteen spindle speeds. This style of head can be furnished on all sizes from the 14" to the 27" inclusive.

The twelve speed patented geared head, belt or motor driven. This drive is furnished only on the 30" and 36" Medium Pattern lathes. The design of this head is simply an extension of that used on the eight speed head, there being only three shafts and twelve gears used in its construction. A double friction countershaft is also furnished with this drive.



8 Speed Patented Geared Head.

The geared head of the 36" and 42" heavy pattern lathes is of the triple geared, face plate driven type. It provides 16 spindle speeds, eight of which are obtained thru the spindle drive and the other eight thru the face plate drive. This head is of an unusually rugged and powerful design, being particularly adapted to the heaviest class of lathe work, such as is found in railroad shops, forge shops and steel mills. Some idea of its great driving power may be gathered from the fact that the greatest speed reduction thru the face plate drive is at the unusually high ratio of 237 to 1. At the normal countershaft speed, the belt will deliver from 30 to 35 H. P. which is far in excess of the power heretofore provided on any lathe of this size or swing. Moreover, we will positively and unqualifiedly guarantee that this lathe is so substantially constructed thruout that it will utilize this power to the greatest possible advantage in machining any work within its capacity.