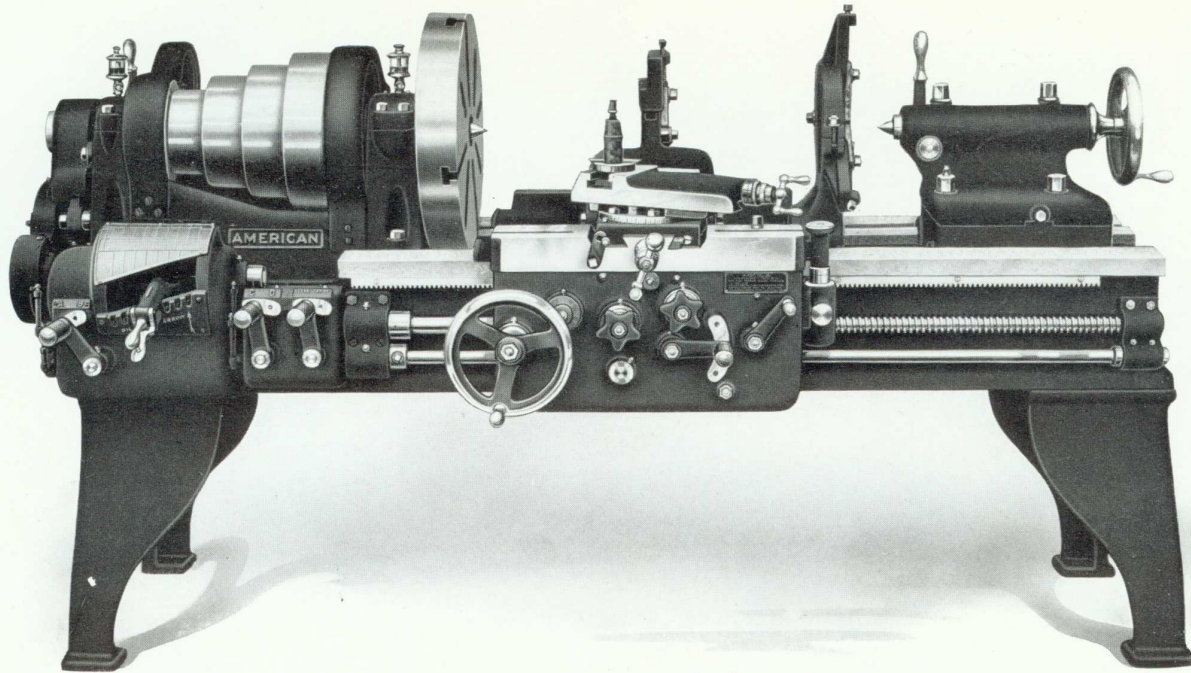


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18 inch Lathe, Fig. No. 13.

CIRCULAR No. 15.



## 18 inch "American" High Duty Lathes.

Built in any Length of Bed, from 6 ft. up, advancing by 2 ft. lengths.

Swings over Bed.....	18 in.
Swings over Compound Rest Slide.....	20½ in.
Standard Length of Bed.....	13¼ in.
6-ft. Bed takes between Centers, tailstock flush, Geared Head.....	6 ft.
6-ft. Bed takes between Centers, tailstock flush, Cone Head.....	27 in.
Hole through Spindle to clear bar.....	27 in.
Size of Tool ordinarily used.....	1½ in.
Tapers of Centers, Morse No. ....	¾ x 1¼ in.
Width of Driving Belt—Geared Head.....	4
Dia. of Driving Pulley—.....	5 in.
Speed of Driving Pulley, r. p. m. ....	12 in.
Width of Driving Belt—Cone Head.....	330
	3½ in.

The following description covers the very latest and most complete development in modern High Duty Lathes. The machine described herein has been designed to supply the demand for a more efficient engine lathe and contains a number of features absolutely new to lathe design.

## THE AMERICAN TOOL WORKS CO.

LATHES, PLANERS, SHAPERS, RADIAL DRILLS.

MAIN OFFICES AND WORKS,

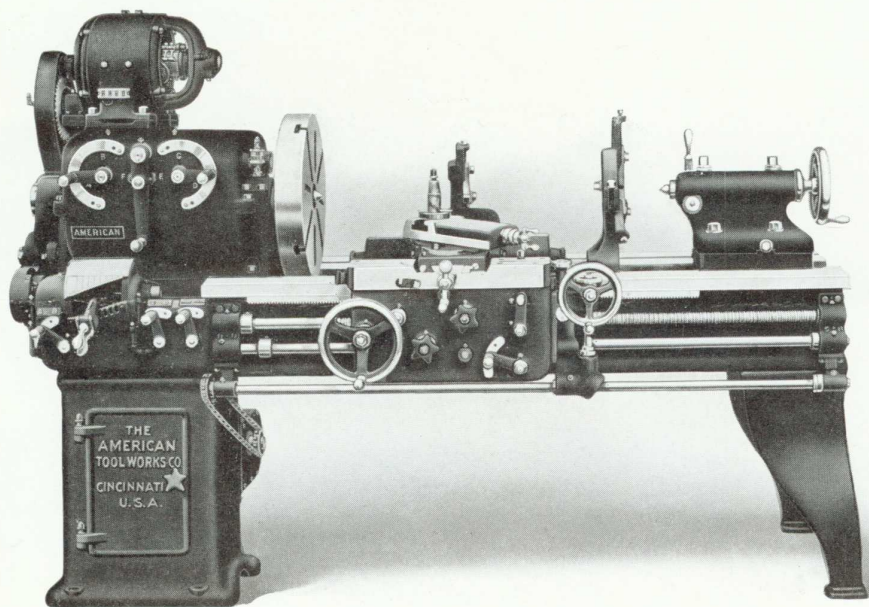
CINCINNATI, U. S. A.

**Bed construction.** The bed is ribbed transversely with heavy double walled cross girths spaced 2' apart and carries a rib in the center, parallel to the ways. This forms a very rigid construction for resisting the various stresses.

**The ways of the bed casting** are carefully chilled, which produces a hard close grained metal for the V bearings. As this provides a harder metal on the shears than on the carriage bearings, the wear which takes place will be largely confined to the carriage, where it will not impair the accuracy or alignment of the machine.

**The carriage Vees** are wider and the bearings longer than are usually provided on other makes. The carriage bridge has also been widened and is of unusually great depth, due to the patented drop Vee construction of the lathe bed.

**The compound rest** is rigidly designed, the swivel being made completely circular and is graduated in degrees. It is clamped to the cross slide by means of four bolts. Full length taper gibs, having end screw adjustment are provided on both the cross and compound rest slides, these gibs being placed on the right hand side where they will not receive the thrust of the tool under ordinary working conditions.



Motor drive thru Patented 8-Speed Geared Head.

**The tailstock** is of our improved four bolt design, the rear bolts being 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 affecting its alignment.

**The headstock spindle** is made from a special .75% carbon hammered crucible steel spindle stock, and all other shafts, including the lead-screw, are made of a .45% 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.

**A standard thrust bearing** is provided which consists of alternate bronze and hardened and ground steel collars. 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** is made in a double wall or box section, giving all studs and shafts an outboard bearing.

**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 .45% carbon ground lead screw stock, and is  $1\frac{5}{8}$ " in diameter. The maximum variation allowed in chasing these screws is .001" per lineal foot and they are guaranteed to be within this limit. These screws are chased by means of a special lead screw made with a Brown & Sharpe master screw.

**The 2" pitch lead screw** permits engaging the half nuts at the proper point when chasing all threads including those having a fractional pitch. This is not only a great time saving feature, but is also a safeguard against errors when chasing unit threads.

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.

**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 the 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 to use in a tumbler gear mechanism, as it permits instantaneous engagement of the gears without clashing. The pointed tooth also has a wider and stronger section than the  $14\frac{1}{2}$  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 cannot be engaged before they are in their proper position for meshing.

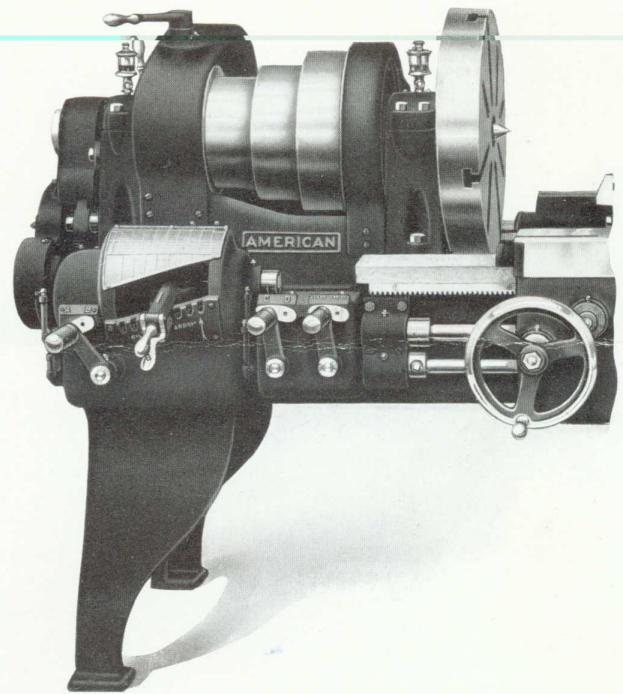
**The quick change gear mechanism** forms a complete unit in itself and is mounted on the front of the machine, being fixed to the bed by means of a tongue and groove which insures permanently accurate alignment. This mechanism is also much more accessible for any necessary attention than where it is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

It provides a range of 48 threads and feeds, all of which are listed on a direct reading index plate located above the tumbler lever. Provision is made for cutting the following threads: 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, 32, 36, 40, 44, 46, 48, 52, 56. For additional threads see Auxiliary Quadrant.

All compounding in the feed box is done by means of taper jaw clutches which can 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.

**Auxiliary Quadrant:**—While these new pattern lathes are provided with an unusually wide range for thread cutting and feeding, provision for applying extra change gears is also made by means of an auxiliary quadrant. This is located on the end of the bed and carries the gears connecting the head with the quick



3-Step Cone, Double Back Geared Head.

*Pa. Appraisal Co.*

*10 Oct. 1967*



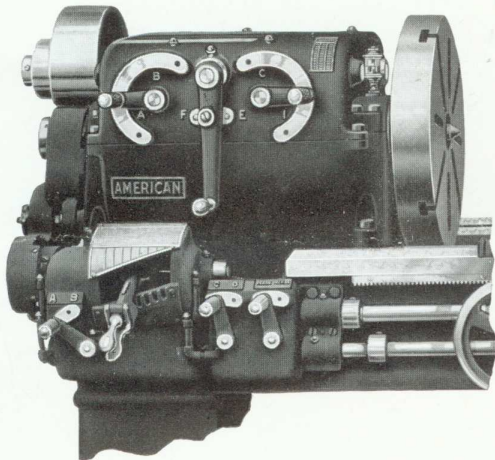
change mechanism. This arrangement enables the use or application of such extra change gears as will be necessary to cut all special or metric threads not regularly furnished with the standard equipment.

**Guaranteed Accuracy:**—If properly set up and levelled "American" Lathes are guaranteed to bore and turn true to within .001 in. The material entering into their construction is also guaranteed in every essential to be the very best obtainable for the purposes used. We will further guarantee to repair any breakages or damage to the machine due to defective material or faulty workmanship.

**Single back geared 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. 4 direct spindle speeds are afforded and 4 reduced speeds. As in the other types of heads, 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.

**Double back geared head** provides 9 spindle speeds both forward and reverse or 18 forward speeds providing the reverse speeds are not required. A back gear shifting lever is furnished by means of which the operation of the double sliding gear is greatly facilitated. The back gear quill and spindle driving pinion are made of steel and are bronze bushed.

**Patented geared head** provides eight spindle speeds; is very powerfully designed, being particularly adapted to a heavy 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 had from the fact that the greatest speed reduction is at the unusually high ratio of 35 to 1. When arranged for motor drive, a constant speed motor either of the direct or alternating current type is located on the top of the patented geared head, and connected to the main driving shaft through three spur gears. Eight fundamental spindle speeds are obtainable from 9 to 330 R. P. M. When apron control is furnished, the motor can be started and stopped by means of a controller hand wheel conveniently located at the right hand end of carriage where a dial indicates how the motor is set.



Patented 8-Speed Geared Head, Belt Driven.

The motor speed can be comparatively high, 700 to 1000 R. P. M., thereby cutting down the size and first cost of same. A pair of sensitive, but powerful friction clutches are provided on the driving shaft for starting and stopping, or slightly moving the gears in head, to facilitate making speed changes without shock to the parts or interfering with the motor speed.

The size of the motor depends entirely upon the nature of the work to be handled. We prefer to have customer specify the size of the motor desired after having made a thorough investigation of the uses to which the lathe is to be put, so that a motor of proper horse power may be supplied. The services of our engineering department are at your disposal to properly determine the range of speeds and size of motor particularly suited to your requirements. If the Lathe must stand up to continuous hard work, a large motor should be used, whereas, if it is intended only for a general line of work, a motor of normal horse power will be amply sufficient. Size of motor should be from 3 to 5 horse power.

**Double friction countershaft** is regularly supplied, with all belt driven lathes.

**Countershaft pulleys on single back geared head** are 12 in. diameter, for 4 in. belt with speeds forward, 230, reverse 280 R. P. M.

**Regular equipment**, upon which base price is determined includes compound, steady and follow rest, thread dial, countershaft for belt drives, large and small face plates and wrenches. An instruction book is regularly supplied giving directions for the installation and operation of our machines.

At extra cost, we can equip this Lathe with improved taper, draw-in and relieving attachments, turret on carriage, turret on shears, turret tool post, double back geared head, "patented" geared head for belt or motor drive, extra gears and index plates for special fine, coarse or metric threads.