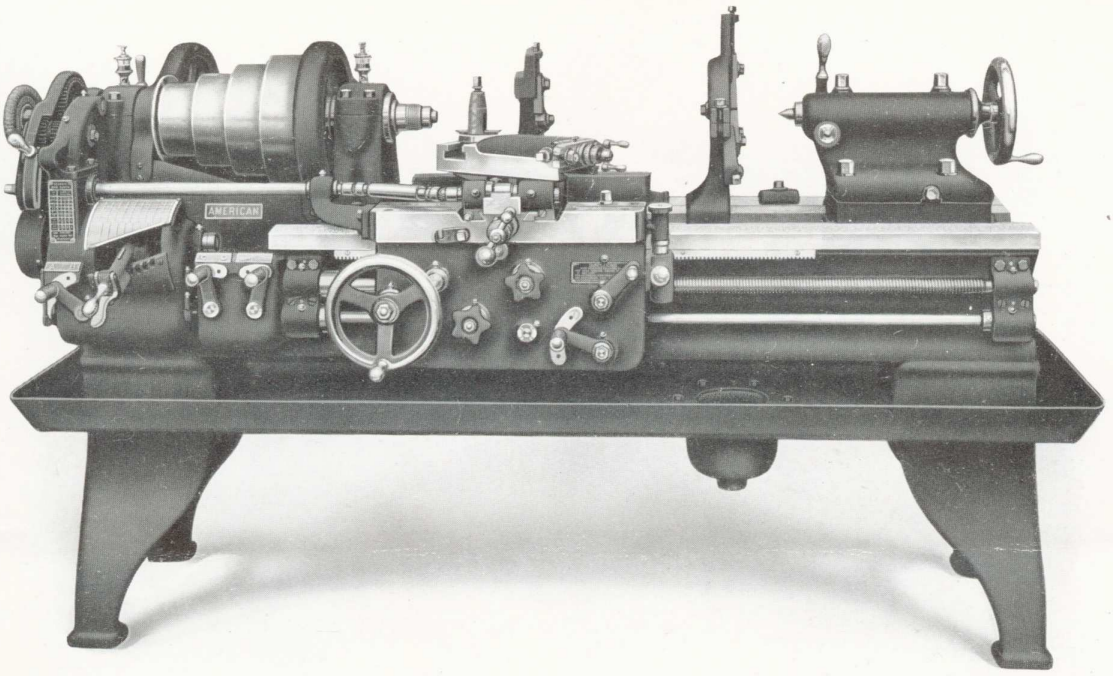
"AMERICAN"

High Duty Tool Room Lathe.



"American" High Duty Tool Room Lathes are built in four (4) sizes, 14 inch, 16 inch, 18 inch and 20 inch. The basis of these lathes is the regular "American" High Duty Lathe with Patented Drop Vee Bed, Double Plate Apron, Patented Quick-Change Mechanism affording 48 thread and feed changes, Phosphor bronze bearings, etc., as described in the circulars covering the standard machines.

The term "Tool Room Lathe" is generally understood to mean a lathe fully equipped with the various attachments, such as the Taper, Draw-in and Relieving Attachments that are required to handle all classes of Tool Room Work. This type of lathe is also usually furnished with a pan for retaining the lubricant which must be used when working on hard steels.

It is not always necessary, however, for a tool room lathe to have all of these attachments, and we are therefore prepared to furnish any one of them separately.

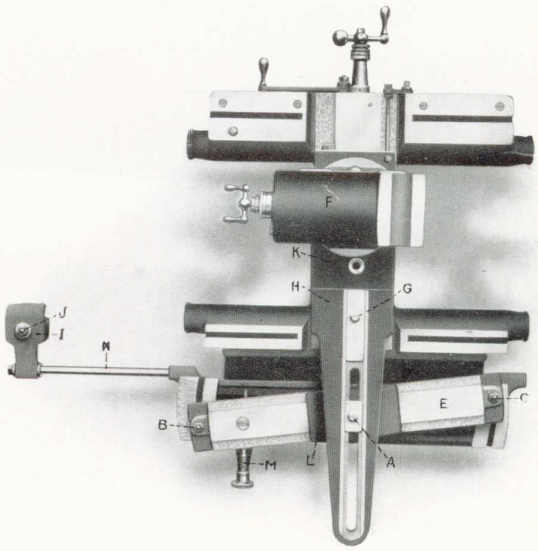
In the following we shall not try to give a description of the entire lathe as that is taken care of by our regular circulars, but will devote our endeavors to a comprehensive description of the various attachments which are essential to a tool room lathe.

Taper Attachment.

The "American" Taper Attachment, shown by the accompanying illustration, is both in design and operation extremely simple, the construction being such as to avoid the spring and inconvenience usually found in such a device. All parts are amply heavy and numerous sliding joints are avoided, thus insuring a rigid mechanism and accuracy of tapers produced therefrom.

Bolted to and traveling with the carriage, the taper attachment can be instantly thrown into operation at any point along the lathe bed, by simply tightening one binder nut (J) on clamping dog, or can be as easily disengaged by releasing this nut.

When attached for taper work, the sliding shoe is directly connected with bottom slide of the tool rest by a heavy cast iron yoke, making its operation instantaneous, at the same time doing away with all lost motion, weakness and inaccuracy found in taper attachments directly connected with cross feed screw.



The Cross Feed Nut is always connected with the tool rest, therefore it can not fall to one side and out of position.

Nut for engaging the Sliding Shoe is arranged to slide in a slot in the yoke connected with tool rest, and is attached to or released from the yoke, as the case may be, by tightening or loosening a single screw.

Accurate Graduations are provided for quickly setting to any desired taper within its range, and in addition there is provided a convenient hand screw with graduated collar, used for extremely accurate setting.

When Taper Attachment is ordered *before* lathes leave our works, all work neces-

sary to its application is finished, so lathe and attachment reach customer ready for use, without any further work being necessary on his part.

When Taper Attachment is ordered *after* lathe leaves our works, it can be readily applied by the user, as all our lathe carriages are drilled to jigs, and properly tapped ready to receive a taper attachment, with a small amount of fitting. Complete information relative to such fitting is furnished by us. There is no necessity of a planed strip on the bed, or any work except a slight amount of fitting to the carriage.

Relieving Attachment.

For Application to 14", 16", 18" and 20" "American" High Duty Lathes.

The function of the Relieving Attachment is to relieve or back off the flutes of rotary cutters, taps, reamers, end mills, hollow mills, dies, etc. Heretofore, all of the relieving attachments on the market have been limited in their capacity for handling different classes of relieving work and to the different types of lathes to which they could be applied, therefore were not universal in their action.

In order to successfully overcome these limitations the New "American" Universal Relieving Attachment has been designed along original lines with the result that this attachment is completely universal in its operation as will be evident from the fact that end and internal relieving can be just as easily performed as straight relieving work, such as relieving cutters, taps, hobs, etc.

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" Relieving Attachment is very simple and efficient in its design, only a few parts beingused 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" High Duty Lathe. In other words the application of this relieving attachment is not limited to one type of lathe as are practically all other similiar attachments, but can be as easily applied to and operated in connection with a geared head 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.

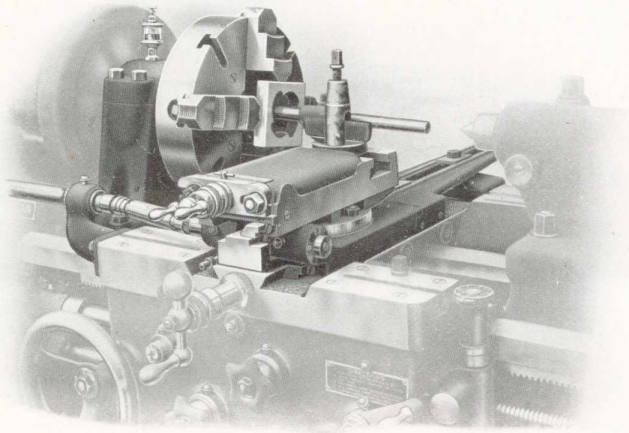


Illustration No. 3 Showing Internal Relief.

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 cams. This feature alone represents a very important advance

in the development of the Relieving Attachment, and greatly increases the efficiency of this mechanism.

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 rises respectively, 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 number of reliefs are obtained by making the slightest changes.

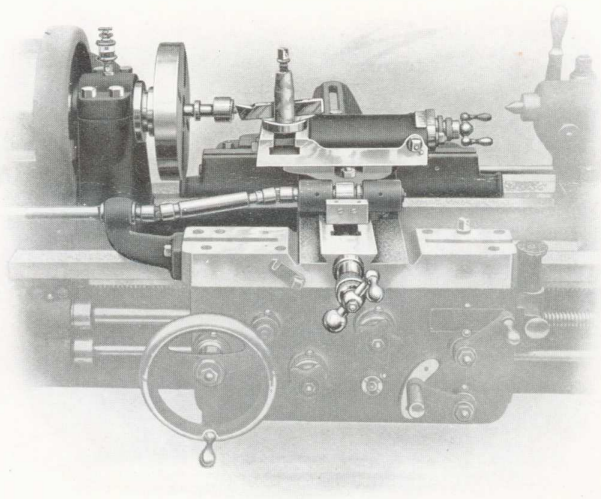


Illustration No. 4 Showing End Re ief

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 of relieving side cutters, end mills, and numerous jobs that heretofore could only be done by hand. On practically all other attachments that can accomodate this class of work, certain changes in, and additions to the regular equipment are necessary to make them operative on internal and end relieving work. On the "American" Relieving Attachment, however, aside from the simple adjusting of the tool slide to its

proper position, there is absolutely no change or readjustment of the mechanism required.

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 thumb screw, while a graduated scale indicates the depth of the relief as set.

As a further proof of the adaptibility 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" Relieving Attachment can be easily arranged to handle such work by the simple addition of extra gears.

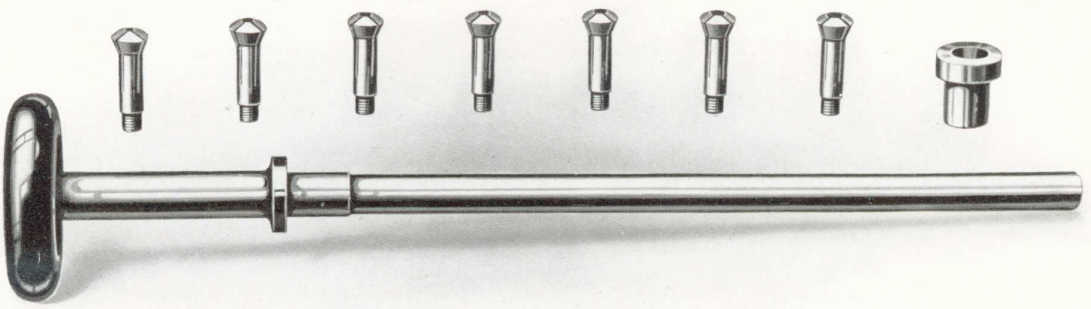
The parts used in the construction of the "American" Universal Relieving Attachment are of the very best material for the service required. The cam yoke is forged. The cams, cam shoe and crank members are of tool steel, hardened and ground. The index bar in the top slide is of forged steel, all shafts and gears are well proportioned, and the entire mechanism is free from trappy construction. The compactness of the elements and their proper relation to each other overcome any tendency to chatter or backlash. All gears are securely covered.

The "American" Universal Relieving Attachment can be applied to any "American" High Duty Lathe below the 24 inch medium pattern size after the machine has left our factory, the application requiring only a slight amount of work on the customer's part.

Draw-in Attachment.

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 of an inch up to $\frac{7}{8}$ inch diameter on the 14 inch and 16 inch sizes and up to 1 inch diameter on the 18 inch and 20 inch lathes.

OIL PAN.

There is very little to be said in connection with the oil pan, aside from the fact that it is made from sheet iron, its purpose being to catch the waste lubricant and thus prevent it from running off onto the floor and being wasted.

Quality.

The "American" Tool Room Lathe is of very recent design, and embodies a number of original features which are described in our High Duty Lathe Circular. We guarantee the workmanship on these machines to be the very best that intelligent effort, combined with long experience, skilled workman and a complete jig and tool system can produce, and likewise positively guarantee every piece of metal that enters into the construction of our tools.

THE AMERICAN TOOL WORKS CO.

LATHES, PLANERS, SHAPERS, RADIAL DRILLS.

CINCINNATI, U. S. A.