

# GETTING THE MOST OUT OF YOUR LATHE

- WOOD TURNING
- METAL TURNING
- METAL SPINNING



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# GETTING THE MOST OUT OF YOUR LATHE

WOOD TURNING — METAL TURNING — METAL SPINNING



Edited by  
SAM BROWN

A Complete Handbook Describing all Branches of Lathe  
Operation in the Home Workshop with Over Two  
Hundred Photographic Illustrations and Line Drawings.

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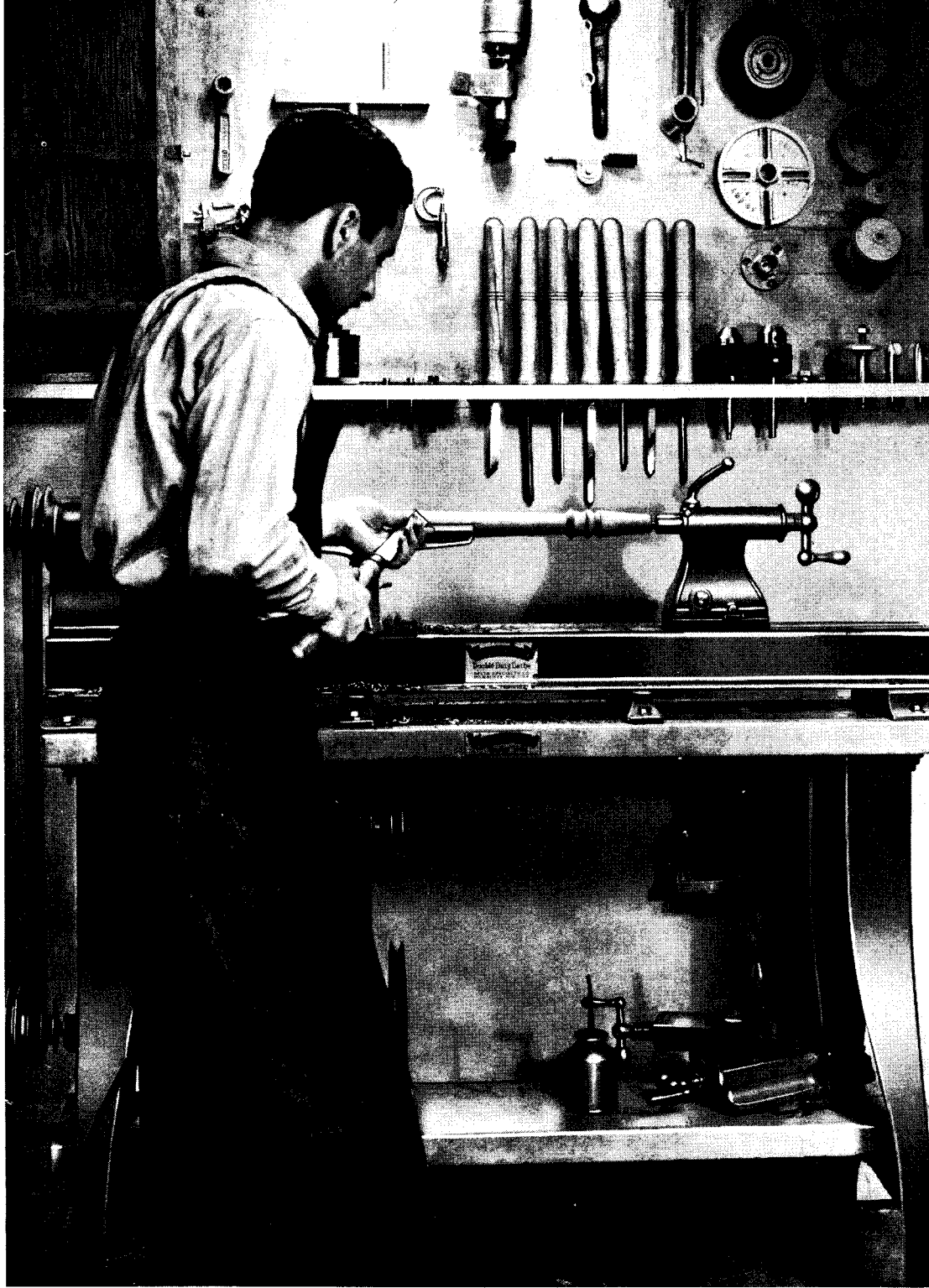
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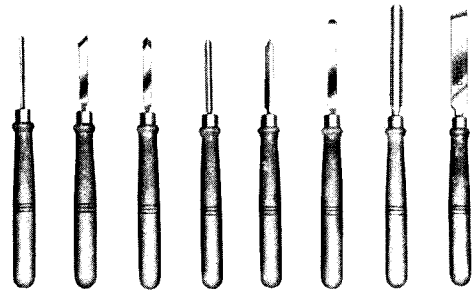
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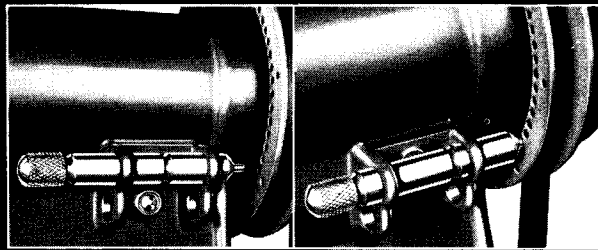


*An Important Corner in the Home Shop . . . The Photo Shows the General Working Position of the Operator. Lighting Should Be Overhead. Tools Should be Arranged on a Convenient Panel or Shelves So That Each Piece Is Easily Located as Required*

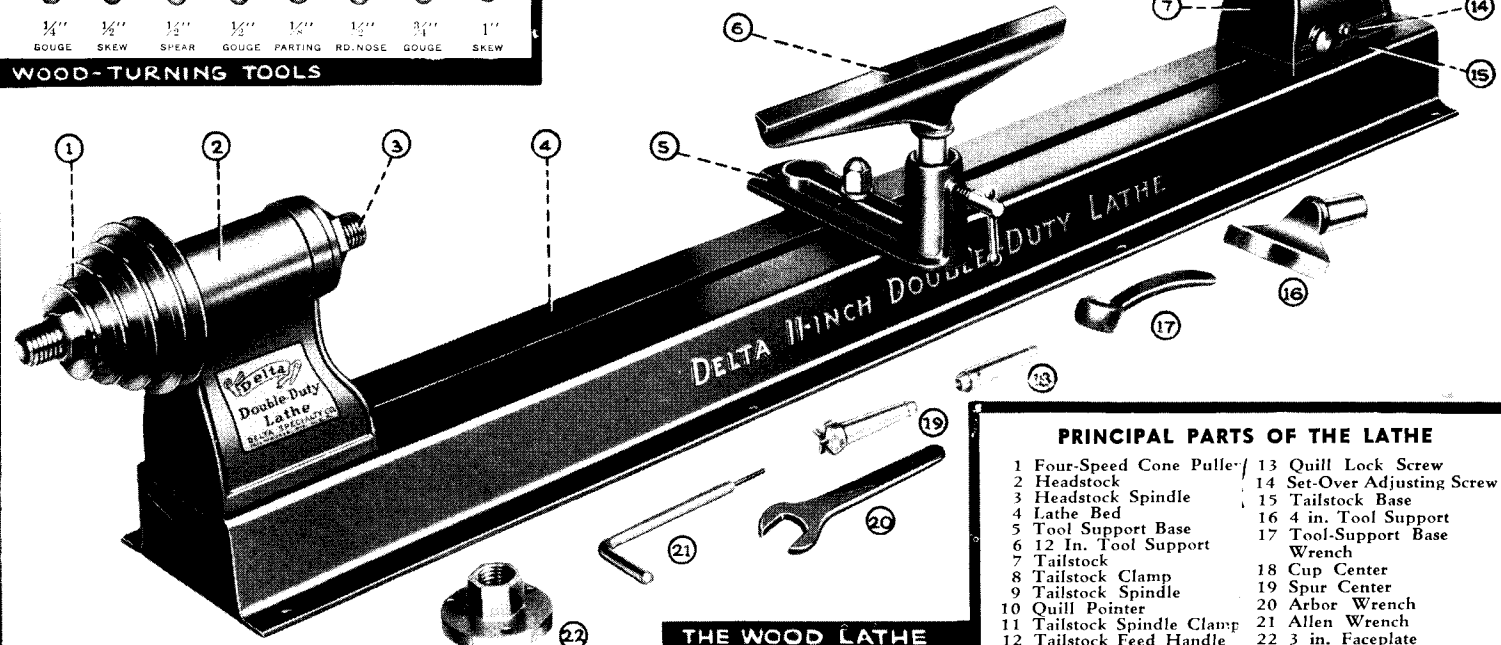
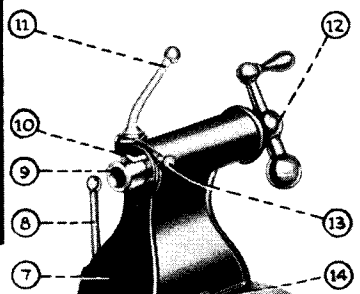


1/4" GOUGE   1/2" SKEW   3/4" SPEAR   1" GOUGE   1 1/4" PARTING   1 1/2" RD. NOSE   1 3/4" GOUGE   1" SKEW

**WOOD-TURNING TOOLS**



**INDEXING MECHANISM**



**THE WOOD LATHE**

**PRINCIPAL PARTS OF THE LATHE**

- |                            |                             |
|----------------------------|-----------------------------|
| 1 Four-Speed Cone Pulley   | 13 Quill Lock Screw         |
| 2 Headstock                | 14 Set-Over Adjusting Screw |
| 3 Headstock Spindle        | 15 Tailstock Base           |
| 4 Lathe Bed                | 16 4 in. Tool Support       |
| 5 Tool Support Base        | 17 Tool-Support Base Wrench |
| 6 12 in. Tool Support      | 18 Cup Center               |
| 7 Tailstock                | 19 Spur Center              |
| 8 Tailstock Clamp          | 20 Arbor Wrench             |
| 9 Tailstock Spindle        | 21 Allen Wrench             |
| 10 Quill Pointer           | 22 3 in. Faceplate          |
| 11 Tailstock Spindle Clamp |                             |
| 12 Tailstock Feed Handle   |                             |

[ 4 ]

# BOOK ONE

## WOOD TURNING

# CHAPTER ONE

## THE LATHE

and its

## EQUIPMENT

**W**OOD TURNING is a fascinating art, and the lathe, more than any other tool in the shop, is in itself a complete unit capable of producing finished work. The operation of the machine is not difficult, indeed, any beginner can make a creditable turning on the very first try by using scraping methods. True wood turning, however, is a cutting operation, and the acquisition of the necessary skill to fashion turnings quickly and well in this manner demands some knowledge of methods and considerable practice in their application.

**The Wood Lathe.**—A typical wood-turning lathe with its principal parts named is shown in the photograph on the opposite page. The essential major parts comprise the *lathe bed*, the *headstock*, the *tailstock*, and the *tool rest*. The headstock carries the live or power-driven spindle, and is firmly fixed to the left end of the lathe bed. The tailstock carries the dead or fixed spindle, and this unit is arranged so that it can be clamped anywhere along the bed of the lathe to suit different-length turnings. The tool rest consists of two major parts—the base and the tool rest itself. Different types of rests are interchangeable in the same base, and the whole unit is readily clamped at any position along the lathe bed.

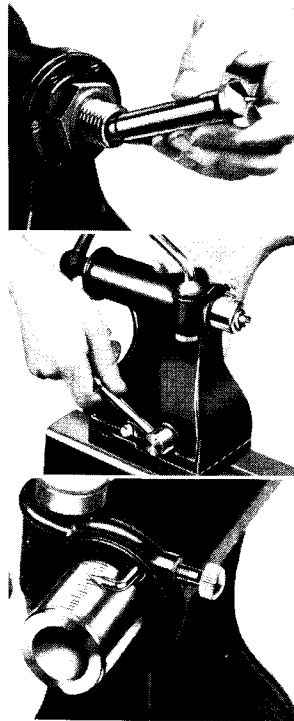
There are two general types of lathe spindles. The one shown in the illustration has a hollow spindle in both headstock and tailstock. The second type has a suitable-diameter arbor on which are clamped or threaded the various lathe attachments. All operations in this book are shown on the hollow spindle lathe, yet it must be understood that these operations can be done just as well on the solid arbor spindle. Both headstock and tailstock spindles have a No. 2 Morse taper hole to take attachments with tapered shanks of the same

size. The two main attachments of this nature are the *spur center*, No. 19, which fits the headstock spindle, and is consequently known as the live center, and the *cup center*, No. 18, which fits the tailstock spindle, and is known as the dead center. In operation, the work is mounted between these two centers for turning, the spurs of the live center serving as the driving member.

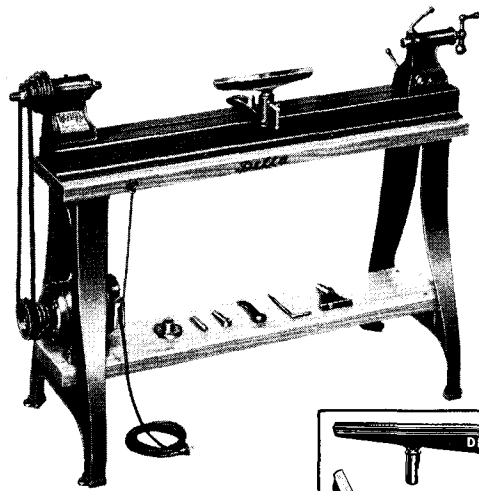
The headstock spindle is also threaded at either end for mounting faceplates, a right-hand thread being used on the inner end of the spindle and a left-hand thread on the outer end. The most common type of faceplate is about 3 in. in diameter, and has a center hole and three outer holes for use in screw-fastening the work to the faceplate.

The tailstock of the lathe has three different adjustments. First of all, it can be moved bodily along the lathe bed and can be clamped at any position by means of the *tailstock clamp* (No. 8). Secondly, it can be moved within slight limits across the bed of the lathe by means of the *set-over screws* (No. 14). Thirdly, the spindle can be projected or retracted inside the body of the tailstock by manipulating the *feed handle* (12). Any desired position can be fixed by clamping the spindle with the *tailstock spindle clamp* (No. 11).

**Indexing Mechanism.**—The indexing mechanism consists of two rows of holes, accurately spaced around the rim of the drive pulley. There are 60 holes in the inside row, spaced 6 degrees apart, and 8 holes in the outer row, spaced 45 degrees apart. The sliding pin on the side of the headstock has two positions so that the point can engage any hole in either inner or outer row. The indexing mechanism is used for dividing faceplate work, and for spacing cuts in fluting, reeding or any similar work de-



Top, inserting the spur center in the hollow headstock spindle. Center, releasing the tailstock clamp. Bottom, the tailstock spindle is graduated as an aid in taking dimensions.



### ● INSTALLATION

manding equal divisions of space around the turning.

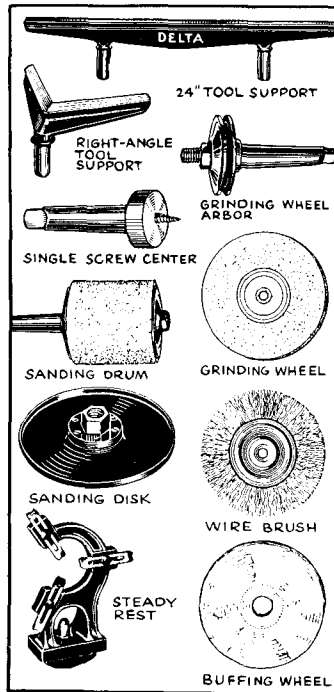
**Tools.**—The standard set of tools used in wood turning comprises five different shapes. Most important of these is the *gouge*, a round-nose, hollow chisel which is used for roughing cuts, cove cutting and other operations. Next in important is the *skew chisel*, a double-ground, flat chisel, with the end ground to an angle instead of being square across. This tool is used for smoothing cylinders, for cutting shoulders, beads, vee-grooves, etc. The *spear* or *diamond-point chisel* and the *round-nose chisel* are scraping tools which are used where their shape fits the contour of the work. The *parting* tool is a double-ground tool, and is used for cutting-off and for make straight incisions to any required diameter.

**Installation.**—The lathe can be mounted on any work bench or on a special bench with steel legs, as shown in the upper photo. The motor can be mounted below or to the rear of the lathe, depending on the method of installation. The motor should be  $\frac{1}{3}$  H.P., 1750 R.P.M., and should be fitted with a 4-speed cone pulley to match the pulley on the headstock spindle. Substantial fastenings are essential. The lathe should be securely fastened by bolts or lag screws to the bench, and the bench itself should be anchored to the floor wherever possible. Raising blocks

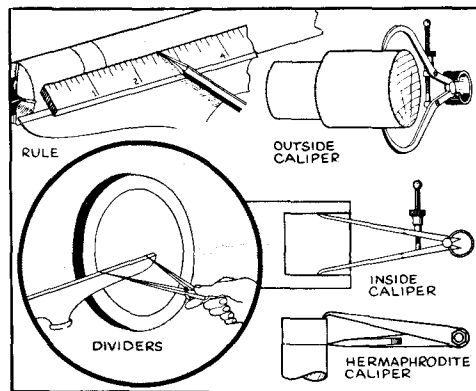
are often used between the lathe bed and the bench top so that shavings can be easily cleared away.

**Accessories.**—The drawing in the center of the page pictures various accessories which are frequently used in wood turning. The *24 in. tool support* is invaluable when doing turnings which cannot be covered from end to end with the shorter tool rest. The *right-angle support* is used for faceplate work, and permits operations on both the rim and face of the turning. The *screw center* furnishes a quick and satisfactory method of mounting small faceplate turnings. The *grinding wheel arbor* is valuable as a means of mounting a *grinding wheel*, *wire brush* or *buffing wheel* in the lathe. Sanding accessories are worthwhile aids, the two most common types being the *sanding drum* and the *sanding disk*. The drum is fitted with a tapered shank to fit inside the headstock spindle, while the disk is threaded to fit the threaded nose of the spindle. The *steady rest* is used as a support for long, slender turnings, or as an end support for shorter work.

**Measuring Tools.**—Lathe work demands certain measuring tools, namely, the *rule* and *calipers*. The rule is used for taking dimensions along the turning, while the various calipers are used in measuring diameters. Calipers are best of the spring type since they are often applied directly to the revolving stock, and must be depended upon to hold a set dimension when in this position. The dividers are used mainly in faceplate work where they are useful in setting off diameters.



### ● ACCESSORIES



### ● MEASURING TOOLS