- Do not grind the carbide cutters. The dust created by grinding the carbide can cause eye and skin irritation as well as respiratory system and internal organ damage.
- Do not allow the cutter to come in contact with the parts of the lathe duplicator or Mark V. The cutter will cause damage to the parts and you could be hit by pieces of metal.

LATHE DUPLICATOR SPEEDS

Warning: As with all Mark V accessories, selecting the proper speed dial setting is important to help prevent damage to the equipment or injury to the operator. Generally, when using the lathe duplicator, slower speeds are used for large stock or during initial rounding operations and then the speed is increased for final shaping and sanding.

Refer to Table 13-2 to determine the correct speed for each operation.

Table 13-2: Lathe Duplicator Speed Chart

Size of Stock	Rounding	Shaping	Sanding
Up to 2" dia.	C (950 RPM)	F (1300 RPM)	K (2050 RPM)
2" to 4" dia.	B (850 RPM)	E (1150 RPM)	J (1900 RPM)
4" to 6" dia.	A (750 RPM)	D (1050 RPM)	H (1600 RPM)
Over 6" dia.	Slow (700 RPM)	A (750 RPM)	B (850 RPM)

NOTE: These speeds are for 60 hz. operations.

PATTERNS AND TEMPLATES

The template support assemblies of the lathe duplicator are designed to hold either flat templates or three dimensional patterns. Flat templates are used for duplicating either spindles (Figure 13-10) or faceplate turnings. Three dimensional patterns are generally used only for duplicating spindles (Figure 13-11). Although it is sometimes possible to use an existing turning as a pattern for faceplate work, the original must usually be destroyed in order to mount a cross-section of it above the workpiece.

A three dimensional pattern can be an original turning-such as a table leg which you have just created by freehand turning-or it could be a spindle from an antique chair you are trying to repair or reproduce. It could even be a broken piece which has been glued back together to serve as a pattern. Appearance isn't

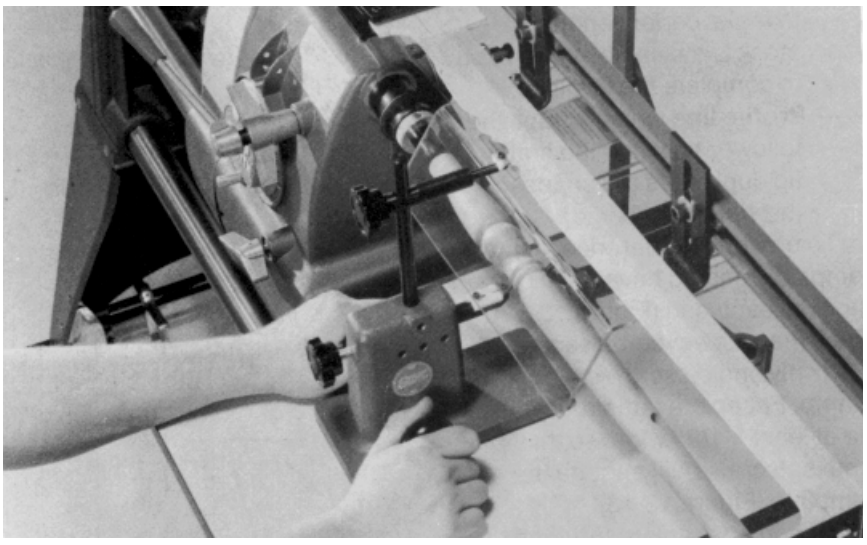

Figure 13-10. Spindles are duplicated from flat templates.

important, but shape is, because every defect in the profile of the pattern will be duplicated in the workpiece.

Template Basics

There are four lines on all templates which are absolutely essential. They are:

- **Centerline** which is used to locate the template in the template clamps directly over the center of the workpiece. This is the most important line on the template.
- **End lines** show the end of the final piece and allow you to make certain enough stock is available at each end to complete the turning.
- **Profile line** which guides the follower tip while the cutter tip duplicates the shape in the workpiece.

To prevent interference, spindle templates should have 2" of extra stock at each end (Figure 13-12). They may, however, be secured with only one setscrew in each clamp. Faceplate templates must be at least 3-1/2" wide, so that both setscrews will engage the template (Figure 13-13).

For some faceplate turnings- such as a thin-walled bowl-one template may not be practical because it would be too fragile. In these cases, you will need separate templates for the inside and outside profiles- or you can make one template with two centerlines (Figure 13-14) and reposition it after turning the outer profile. In either case, accurate construction is extremely important.

After a template has been mounted and you are sure its position is correct, you can drill a 1/4" locating hole through the template clamp (Figure 13-15). The template can then be removed and replaced very accurately by inserting a 1/4" dowel through the centering hole in the template clamp and template.

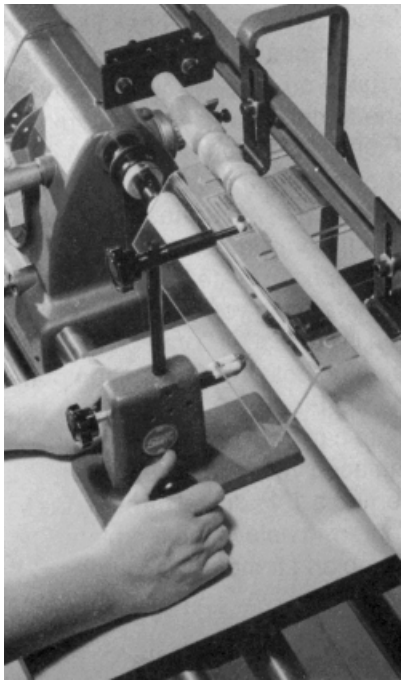

Figure 13-11. Spindles are also duplicated from an existing turning.

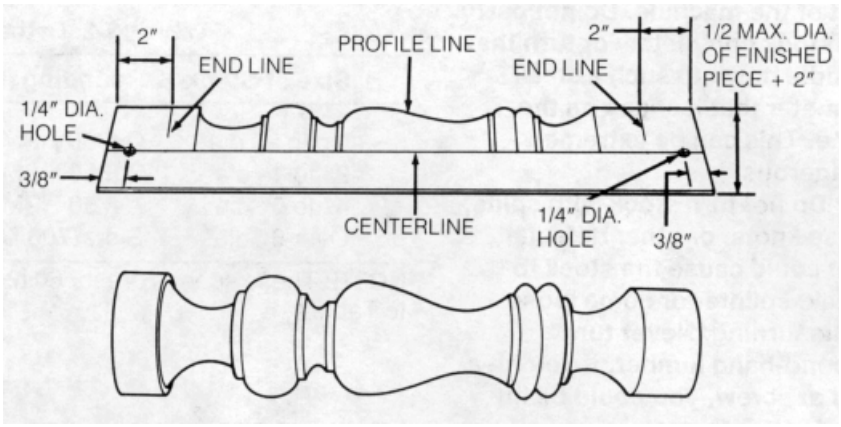

Figure 13-12. A typical spindle template showing important dimensions and its finished product.

Template Materials
Templates may be made from a variety of materials. Probably the most popular and economical choice is 1/4" thick tempered hardboard. It is hard and durable and yet it is easy to cut and sand.

For greater accuracy and durability, use sheet acrylic materials. Although somewhat more difficult to cut and sand, acrylic templates will last almost indefinitely.

After an acrylic template has been cut and shaped, scribe the critical lines into its surface. Then remove the paper covering. The clear template allows light to shine through the template and eliminates shadows on the workpiece. For better visibility, you can also accent the profile edge of the template with a colored marker.

Templates may also be made of wood if thin stock or a thickness planer is available. Hard, closed grain woods are best. Softer, more open grained woods are not recommended because the template is easily dented or chipped and becomes useless.

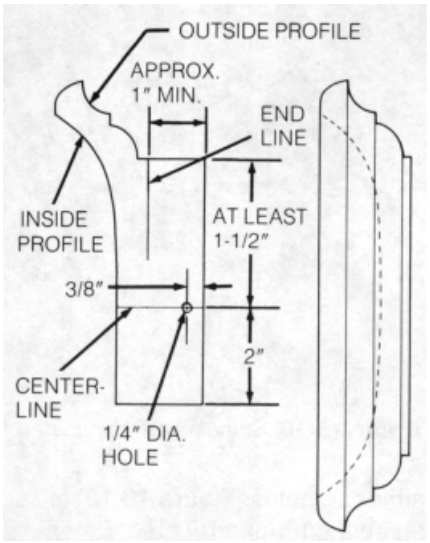

Figure 13-13. A typical faceplate template showing important dimensions and its finished product.

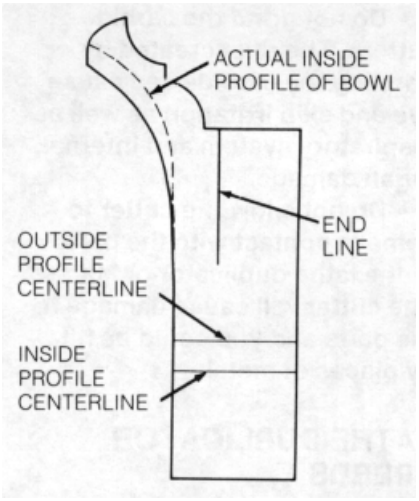

Figure 13-14. A template with two centerlines for making a thin-walled bowl.

Template Construction
Templates are made by creating a full size drawing of the turning, attaching the drawing to suitable stock with rubber cement and then cutting out the profile with a bandsaw, jigsaw or scroll saw.

If your project plans are not full size, they must be enlarged. This may be done by using a grid system to scale up the drawing or by using a pantograph to trace and enlarge the image. Even more accurate enlargements can be made with a copier machine. When you have your full size drawing, check to be sure the available cutters will fit into any narrow grooves or profiles.

Once the full size drawing has been attached to the template stock, cut out the template (Figure 13-16). Note that the first cuts to be made are relief cuts that let waste stock fall away as you cut the profile. This helps keep the blade from binding in tight spots and lets you make each cut more precisely.

Next cut each section of the profile staying slightly outside the line to leave a little stock for final sanding. Use multiple cuts whenever necessary to avoid difficult turns with the blade. The profiles will be smoother with less sanding required.

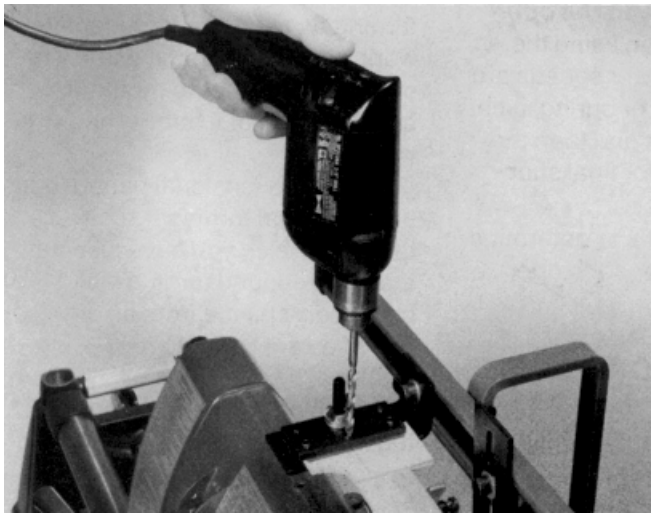

Figure 13-15. Drill a locating hole when template will be removed and used again.