

Band Saw Tool School

Read This Important Safety Notice

To prevent accidents, keep safety in mind while you work. Use the safety guards installed on power equipment; they are for your protection.

When working on power equipment, keep fingers away from saw blades, wear safety goggles to prevent injuries from flying wood chips and sawdust, wear hearing protection and consider installing a dust vacuum to reduce the amount of airborne sawdust in your woodshop.

Don't wear loose clothing, such as neckties or shirts with loose sleeves, or jewelry, such as rings, necklaces or bracelets, when working on power equipment. Tie back long hair to prevent it from getting caught in your equipment.

People who are sensitive to certain chemicals should check the chemical content of any product before using it.

Due to the variability of local conditions, construction materials, skill levels, etc., neither the author nor Popular Woodworking Books assumes any responsibility for any accidents, injuries, damages or other losses incurred resulting from the material presented in this book.

The authors and editors who compiled this book have tried to make the contents as accurate and correct as possible. Plans, illustrations, photographs and text have been carefully checked. All instructions, plans and projects should be carefully read, studied and understood before beginning construction.

Prices listed for supplies and equipment were current at the time of publication and are subject to change.

Metric Conversion Chart

<i>to convert</i>	<i>to</i>	<i>multiply by</i>
Inches	Centimeters	2.54
Centimeters	Inches	0.4
Feet	Centimeters	30.5
Centimeters	Feet	0.03
Yards	Meters	0.9
Meters	Yards	1.1

band saws and scroll saws



Although a band saw is rarely the first stationary power tool purchased for a shop, it is one of the most versatile. A scroll saw cannot only be used for fun craft work, but also for cutting decorative mouldings and other furniture and cabinetry pieces.

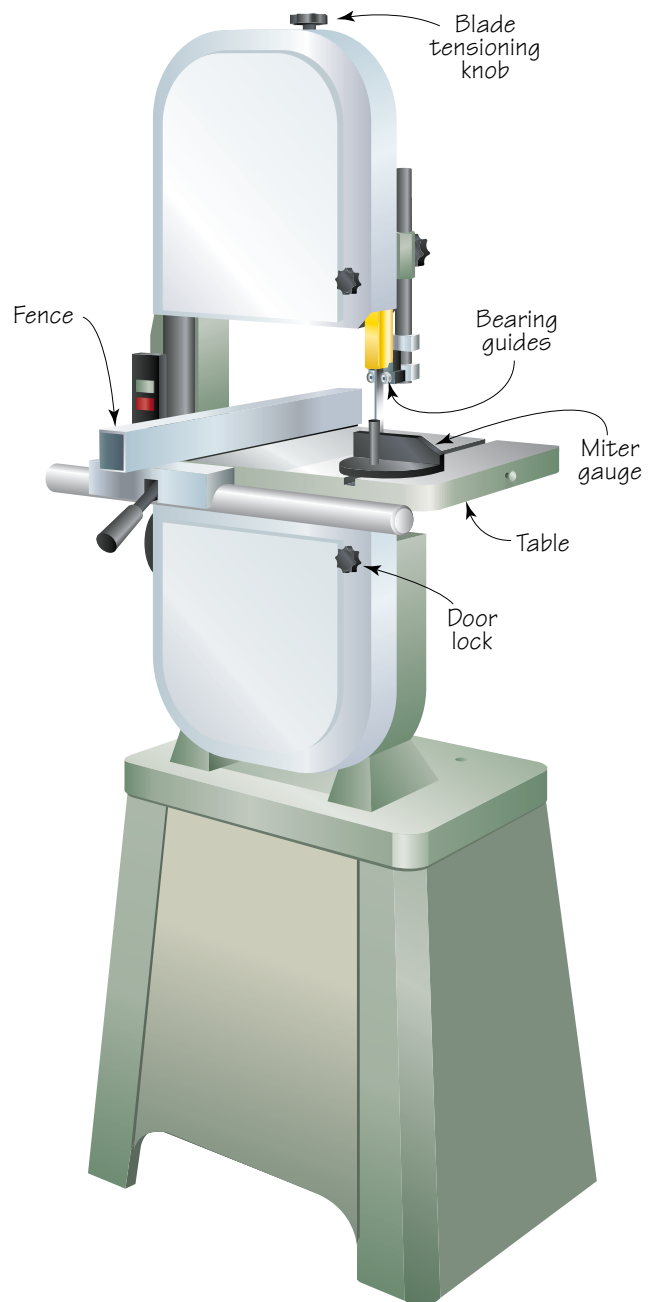
BAND SAW

A band saw can be used to cut curves, even in thick lumber, such as in creating cabriole legs, to rip lumber and to crosscut short pieces. The most common use for the band saw, however, is in cutting irregular shapes. The second most common use is in resawing or ripping lumber into thinner slabs. A band saw also makes the smoothest cuts and, with the appropriate blade, can be used to cut materials other than wood, including metal.

What to Look For

Band saws are basically a pair of wheels, or occasionally three wheels, holding a thin rotating blade, a table to support the work and a motor to run it. I built my first band saw many years ago using a kit from the Gilliom Mfg. Company. The company supplied the wheels and other parts, you supplied the motor and constructed a wooden cabinet. Band saws are available in a variety of sizes, ranging from small bench-top to huge floor models. Bench-top saws are portable and can be placed on a workbench, or bolted to a stand for support. These usually don't have the capacity, or the resawing capabilities of floor models, but are much more economical. Bench-top models are also handy if you are limited on shop space. Band saw size determines the stock size it will handle and the size is based on two dimensions. First is the distance between the inner edge of the blade and the throat of the saw. A 14" band saw has a 14" measurement between the two. This measurement may range from 10" up to 24". Some manufacturers may go by the wheel size, which will make the measurement smaller. The second dimension is the depth of cut — the distance between the table and the underside of the blade guide/guard. On a saw with a 6" depth of cut, you can actually cut about $5\frac{7}{8}$ " due to the clearance needed for the guide to assure easy movement of the work.

The type and size of table on the saw is also important. The larger the table, the easier it is to hold and guide stock through the saw. The table should also have the capability to be set at an angle up to 45°. One use in this mode is removing the corners of a large turning block to speed up stock removal when turning on a lathe. Most band saws also come with a fence, used for resawing, and a miter gauge to use when crosscut sawing. Band saws do tend to vibrate and regardless of bench or floor model it should be well built with a sturdy cabinet. Bench models should be bolted, screwed or clamped to a solid surface. For the most part band saws can be used as they come from the factory. You can purchase riser kits for some saws to increase the depth of cut. And, more accurate



blade guides are also available as after-market additions. If you are purchasing a good quality saw, however, you probably won't need these items initially. Band saws are also available with different size motors, typically ranging from $\frac{1}{3}$ up to $1\frac{1}{2}$ horsepower. If you intend to cut only thin stock, the smaller size motors will suffice. If you intend to do any resawing, a larger motor is required.



It is important that all the guides be adjusted properly. Better quality band saws feature roller-bearing guides.



Band saw blades ride on rubber-covered wheels. It is important to have proper blade tension to match the blade width.

Band saws have a tension guide in order to match tension with the blade width.

How to Use

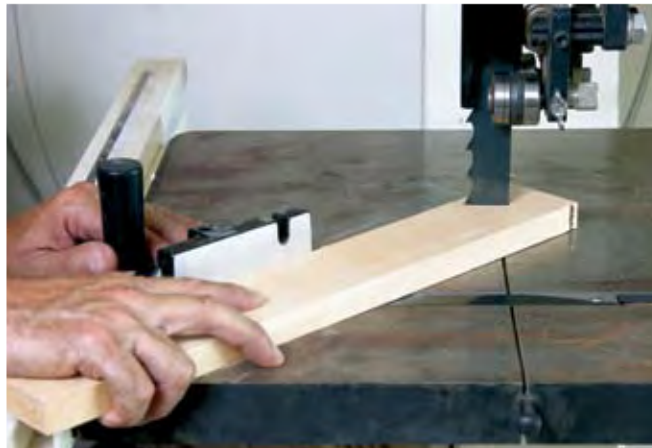
Having your band saw in proper adjustment is important. The blade must be tensioned properly and the guides adjusted. Follow your manufacturer's directions for proper adjustment. The tension is loosened to install or change blades. The blade is positioned in the center of the wheels and the tension set according to the width of the blade, per instructions that came with the tool. The wider the blade, the more tension required. Blade tension keeps the blade tracking properly. If the tension is set too high, however, the blade will break. With the guard open and the machine turned off and unplugged, slowly revolve one wheel a couple of turns to determine if the blade is aligned properly. If the blade is tracking properly, close the guard and turn on the machine to make sure the blade stays tracking properly.

The next step is to make sure the blade guides are adjusted. The back of the blade should barely touch the rear guide, with the teeth running clear of the guides. Most band saws today have bearing guides. The guides should be set so the blade just touches the guides when pressure is applied with the wood. Some models have brass or metal side bearings that must be adjusted in or out and replaced or filed or turned around as they become worn.

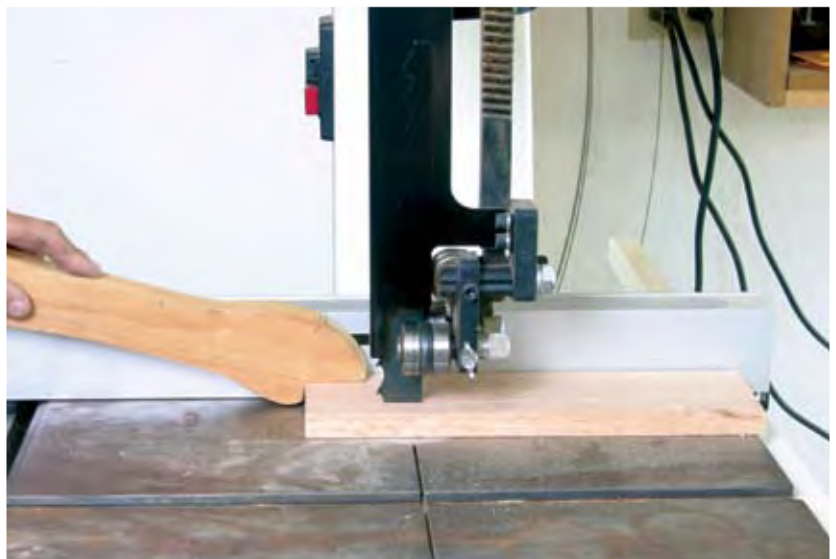
Using a band saw is fun. As with any tool, proficiency comes with practice. Follow all safety rules with your saw. Keep your hands clear of the cut line. A band saw is a relatively safe tool, but the blade is sharp and fast and can inflict serious injury in a fraction of a second. Hold your hands on both sides of the cut line and clear of the blade. If a small piece of waste is being cut off, keep both hands on the main piece. If your hands are on the small



The blade guides are adjustable up and down to match the thickness of the stock being cut. Quality saws such as the Jet shown utilize a wheel for adjustment.



Most band saws come with a miter fence for crosscutting.



Better quality band saws have locking fences for ripping materials.

waste piece they may slip into the blade as the piece is released by the cut. Always wear safety glasses. If you haven't used a band saw before, make practice cuts on scrap softwood stock and then try hardwood scraps. Mark the cut line and move the stock slowly, steadily and firmly against the blade. If you push the stock out of line to one side, the blade will bend and the cut will not be vertical. Do not cut a smaller radius than the blade size can handle. The blade will bind and can jump off the wheel. Instead, cut sharp curves by making a series of relief cuts up to the cut line. Then make a series of short "whittling" cuts to remove the waste between the relief cuts. When making irregular cuts, if possible, keep the waste portion on the outside. And, make any short connecting cuts first. It is difficult to back out of a long curved cut, especially if the work piece hits the frame of the machine.

Cutting compound curves is a fun practice that can be used to create cabriole legs and other designs. Mark the cuts onto adjoining edges of stock. Cut the waste pieces from one side, tape them back in place, turn the stock 90° and make the two cuts on the adjoining side.

You can also cut perfect circles on a band saw with a shop-made jig. First scribe the circle on the wood and locate the center of the circle. Drill a hole through the center. At the point where the cut is to start, make a cut a couple of inches long tangent to the circle. Fasten an auxiliary table to your band saw table. Position the stock on the auxiliary table with the started cut against the saw blade. Drive a nail or screw through the hole in the stock to be cut and down into the auxiliary table at right angles to the saw blade. Turn the stock into the band saw blade allowing the stock to pivot on the screw or nail. You can cut a large circle in this manner, relative to the capacity of your band saw.

If you have a number of identical pieces to cut, the best method is to use a tem-



Regular tooth



Hook tooth



Skip tooth



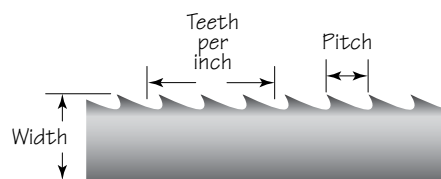
Wavy set



Racker set



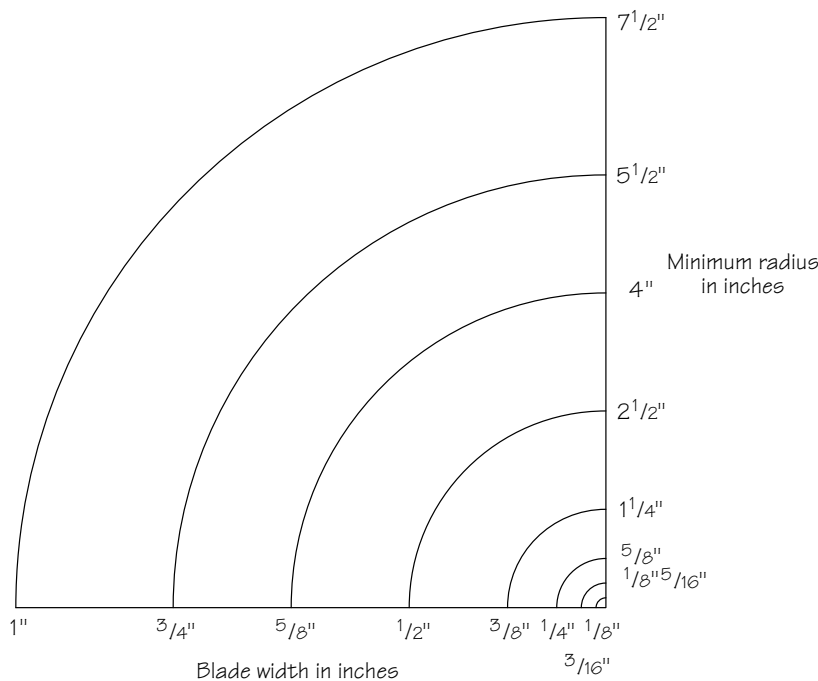
Alternative set



Band saw blades are available in different widths, and types for different chores.



The most common use of a band saw is making curved or irregular cuts.



When making irregular cuts it's important to match the blade size to the radius being cut.

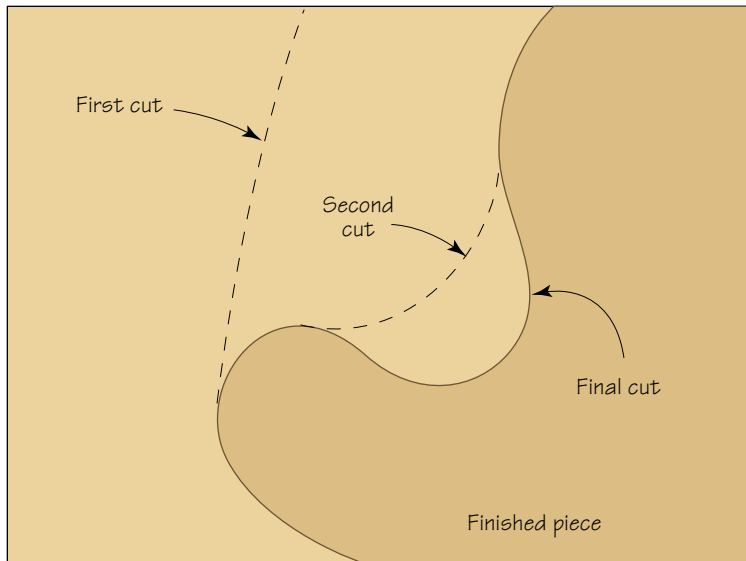
plate and a follower jig clamped to the saw table. Attach the template to the stock to be cut with double-faced tape. Then run the template against the follower.

One of the biggest band saw chores is resawing, or sawing thick stock into thinner stock. This is often used when highly figured wood is chosen for a door panel or other furniture project. Set up correctly you can even saw your own veneer. Wide blades must be used. The saw guides must be set properly to keep the blade from wandering or "running out." A fence, of course, must also be used. Even with all that, some *lead* will happen as the blade tends to saw to one side or the other. The Jet saw shown has a resaw guide that attaches to the saw fence and alleviates the lead problem. A high fence can also be made from wood stock and clamped to the saw table. Saw a scrap stock to determine the lead and adjust the ends of the fence to account for the lead.

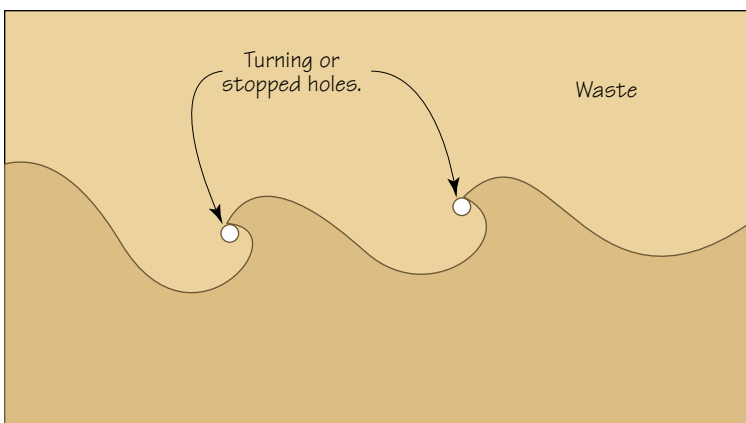
Band saw blades are also available in a variety of sizes and tooth styles, and it's important to match the blade to the chore. Sizes range from 1/8" in width up to more than 1". It's important to choose the proper blade for the chore. To cut sharp curves in thin stock, choose narrower blades. Move up to wider blades for thicker stock. Resawing requires the bigger blades. The pitch or number of teeth per inch (TPI) of the blade is determined by the hardness of the wood being cut, and varies from 4 up to 15 tpi. Basically the coarser the teeth, the faster the blade will cut. More teeth per inch, however, produce a smoother cut. Hardwoods require a finer pitch or a blade with more teeth. Regardless, there should be three teeth in contact with the stock, no matter how thin.

Choosing Blades

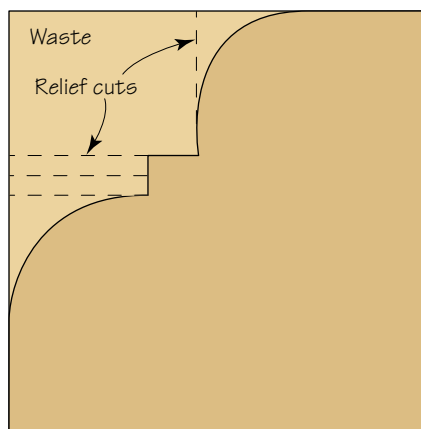
Blades are also available with different tooth patterns for the various chores. These are commonly called hook tooth, skip tooth, raker-set and wavy-set. Hook



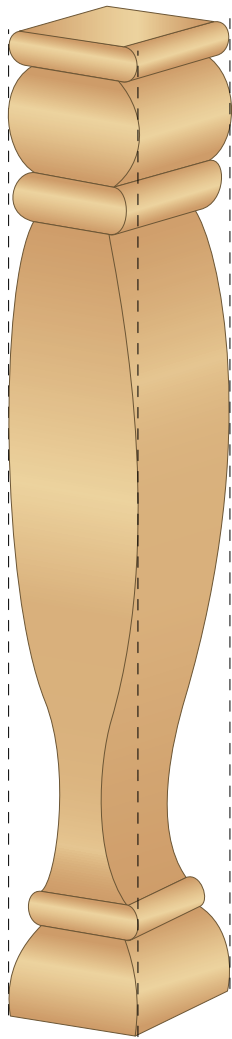
When making cuts with sharp curves use several cuts to release various portions of waste stock.



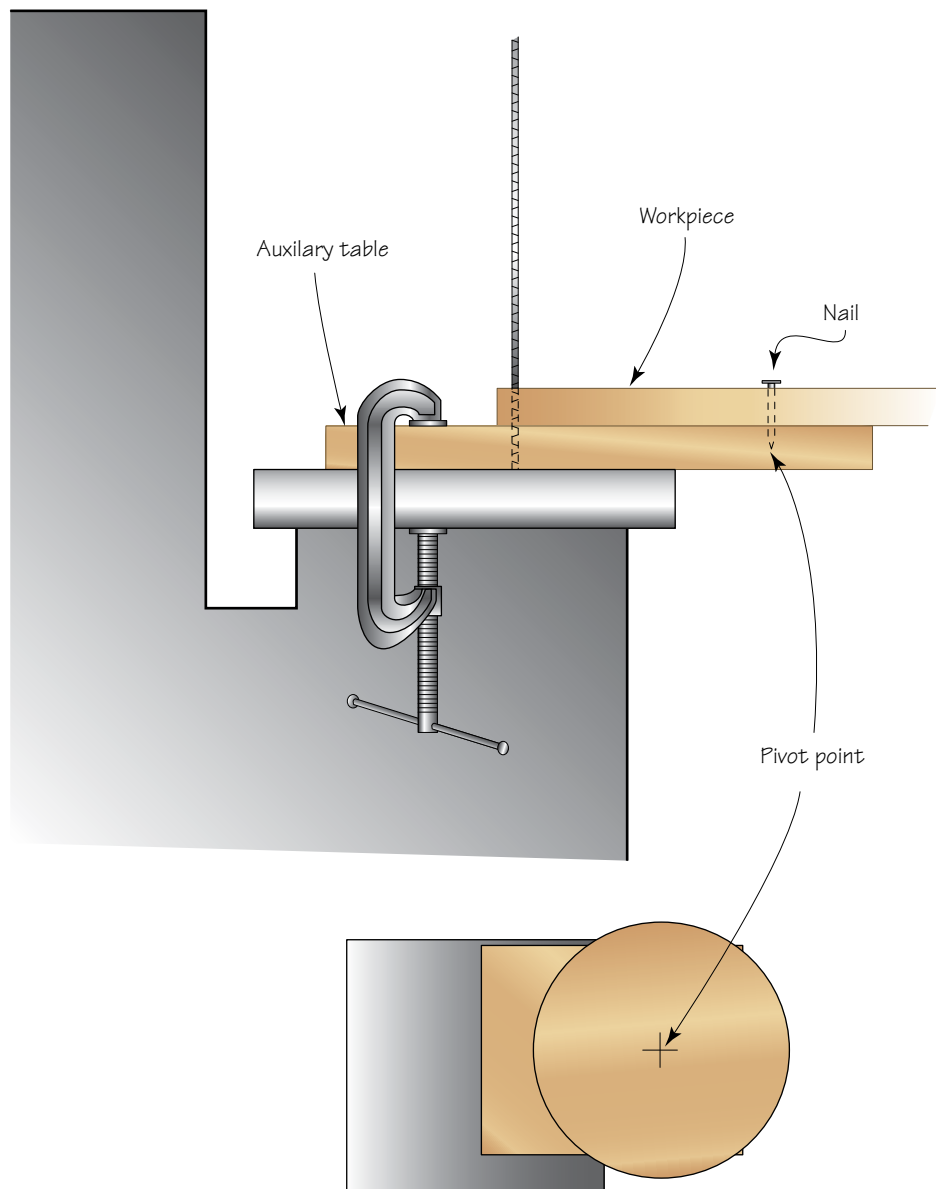
Turning or stopped holes can also be used for sharp corners.



When cutting square corners, use relief cuts as well.



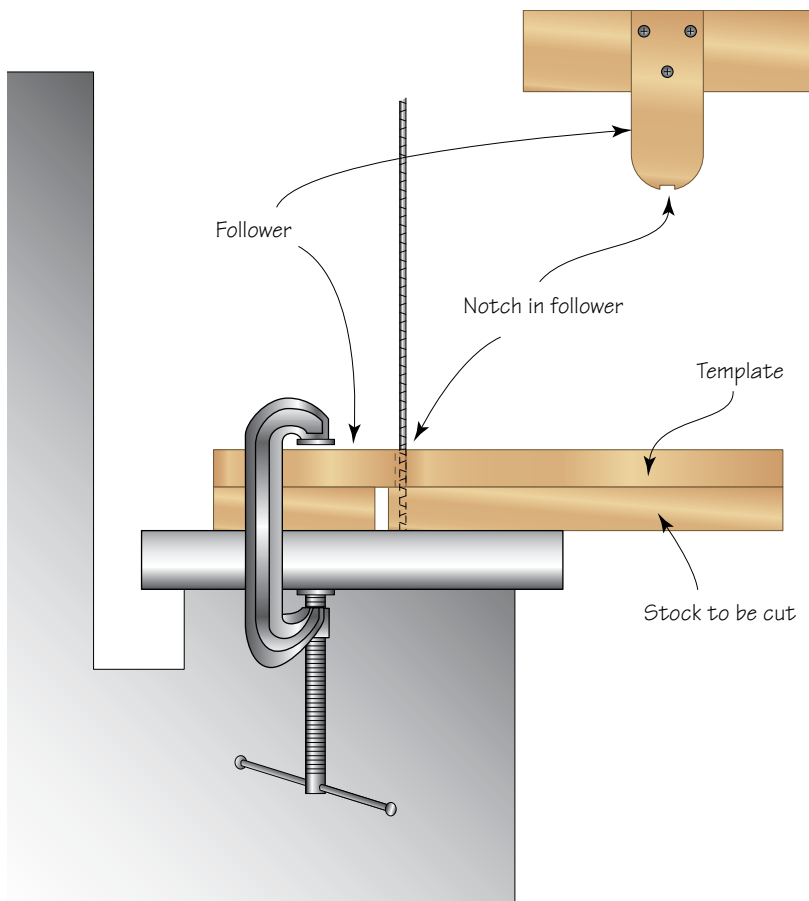
Cabriole legs and other multiple-cut pieces can be created with a band saw.



Circles can also be precisely cut with a band saw using an auxiliary table.

tooth blades have wide teeth and are more closely spaced. They are best for hardwoods, harder non-ferrous metals as well as plastics. Skip tooth blades have widely spaced teeth to provide better chip clearance when cutting the softer metals and for soft, non-ferrous metals such as aluminum. Wavy- and raker-set tooth blades are primarily used for cutting ferrous metal. A wavy-set blade is used with horizontal band saws used primarily for cutting ferrous metal. Some manufacturers also sell blades categorized as to purpose, such as general woodcutting, scrolling and non-ferrous or ferrous metal-cutting blades.

Blades are also available in various widths, ranging from $\frac{1}{8}$ " up to 1". When making straight cuts, such as crosscutting or ripping, including resawing, the blade should be as wide as your saw will handle. The wider the blade, the straighter the cut will be. When making irregular cuts, the blade should be matched to the radius being cut. It's important to have a variety of blades on hand for the different chores. Changing blades is fairly quick and easy on most band saws. Blades come coiled and it's important to release them from the coil carefully so they don't snap out and cut you. Wearing protective gloves is also suggested. If you want to recoil a blade, hold it with the back of the blade facing you. Rotate the left wrist down and the right wrist thumb up simultaneously. At the same time move your hands inward. Keep twisting your wrists to force the blade to coil into a triple loop. Tie the coils together in three places and then lightly spray with a rust-preventive spray.



Identical pieces can be cut using a follower and a template.



Band saws can also be used for resawing thick stock into thinner stock. The Jet model shown features a bolt-on resaw accessory.