

The Backsaw

How to buy, use and sharpen this basic tool

by Ian J. Kirby

Backsaw is the generic name for any handsaw with a metal stiffening strip along its top edge, opposite the teeth. A backsaw works like any handsaw that cuts on the push stroke, but a finer cut is possible because the saw's reinforcing strip allows a thinner blade. This saw shouldn't be overlooked by the machine woodworker—it's a versatile tool for cutting tenons, dovetails and other joints, and for clean crosscuts.

Of the better-quality saws now manufactured, there are two main types—the tenon saw and the dovetail saw. The tenon saw is the larger of the two, and it is commonly sold in three lengths: 10-in., 12-in., and 14-in. Selecting the length is really a matter of personal preference. The 12-in. length is probably the most useful; the 14-in. is heavier and therefore more difficult to use. Tenon-saw blades are about 4 in. wide and usually have 13 or 15 points per inch. The dovetail saw looks like a miniature version of the tenon saw. It is commonly 8 in. long and about 3½ in. wide, with 20 points to the inch. Dovetail saws with blades 2 in. wide are sold. These usually have a turned rather than a pistol-grip handle.

The dovetail saw's finer teeth leave a smoother surface than does a tenon saw, inviting its use for cutting tenons. Don't yield to the temptation, because dovetail saws are quite delicate and should be reserved for sawing thin wood. A good rule of thumb is that the dovetail saw will keep an accurate cut 1 in. deep in 1-in. thick maple, maximum.

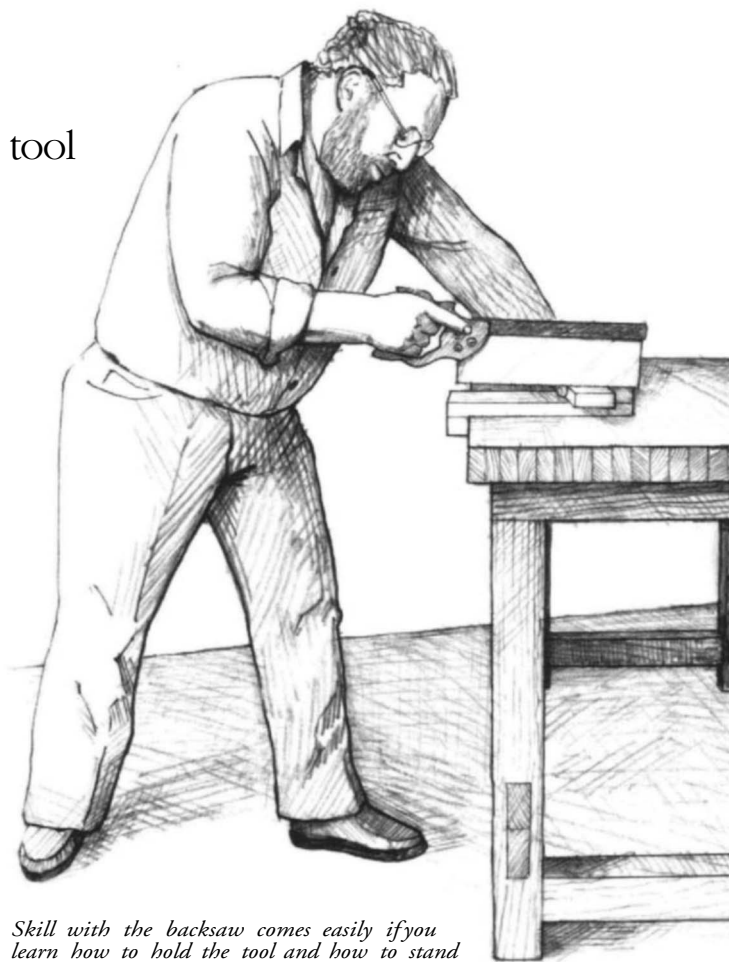
The best-quality backsaws available in North America are brass-backed and English-made, though steel-backed saws of good quality are sold. If you order a saw through the mail, inspect it carefully before you accept it. First, hold the saw end-on at arm's length with the handle away from you and sight down the blade. The sides of the brass back should be parallel to the sides of the blade. Misalignment doesn't affect the way the saw cuts, but sighting along the back is the easiest way to keep the saw upright, and learning to compensate for one that is askew is a skill you can do without.

Next, turn the saw teeth up and sight along them for straightness. A slight curve at one end or the other can be gently bent out of the blade, but an S-curve should be rejected. Rotate the saw 90° and view it again to check the blade for wind or twist. A slight twist can be corrected by bending it the other way. An inaccurately mounted handle may make the blade appear twisted, a difficult condition to adjust.

Finally, sight the back for straightness. This isn't easy, because the metal is folded and distorted during manufacture, but you can at least gain an impression.

Using the backsaw—The backsaw can cut along the grain, as when sawing tenon cheeks or dovetails, or across the grain,

Ian J. Kirby is an educator, designer and cabinetmaker. For more on the backsaw and the joints it will cut, see FWW #2, p. 28, and #15, p. 46.



Skill with the backsaw comes easily if you learn how to hold the tool and how to stand comfortably. Sawing is primarily an arm movement and it's encouraged by the stance illustrated above. Kirby saws right-handed, so he places his right foot farther back and bends slightly at the knees. You should modify this stance to your own comfort. He grips the saw much like a pistol; the pointed index finger is important, as it spreads and strengthens the grip, and helps you keep the saw vertical.

as in cutting boards to finished length or sawing tenon shoulders. For each type of cutting, there are refinements of technique, but the basic operation of the saw is the same.

Grip the saw with three fingers wrapped around its handle, the index finger pointed alongside the handle toward the saw tip. Extending your index finger is important: it spreads and strengthens your grip, and it helps you keep the saw vertical. Wrap your thumb around the back of the handle so that it just touches your middle or ring finger.

From your grip to your shoulder, the saw, wrist, forearm and upper arm should be in a straight line when viewed from above. From a side view, the forearm should be in a line that if extended would intersect the saw at about the center of its length. Work to be sawn should be positioned on the bench at a comfortable height (which obviously varies with the individual) that gets you closest to this alignment. The rest of the body doesn't do anything when you're sawing—the action is entirely an arm movement—but you must position yourself so that you can easily move your arm like a piston. If you are off to the left or right of the line of sawing, your wrist will turn and the saw will jam.

Stand comfortably away from the workpiece and lower your body to a crouch by placing your right foot (if you are sawing right-handed) farther back and bending your knees

slightly. Standing with your feet too close together bunches up the whole flow of movement and is an almost universal fault among beginners. You'll never get your foot back far enough by inching it back, so put your rear foot ridiculously far back, then inch it forward.

Before you actually begin to saw, you will have to learn to position the saw correctly on the work. This is best done by sighting down the saw back and developing a feel for where the saw is, relative to the work. You want to hold the blade vertical, at right angles to the surface you are cutting, and at the same time learn to sense the angle at which the line of teeth strike the wood. To sense verticality, you could have a friend stand in front of you and simply tell you when you are tilting the saw—a warm gesture but pretty much a waste of time for your friend. A better method is to prop a mirror in front of you on the bench and make the observation solo. You could also set a small square next to the saw for reference, but I think that this method is less accurate than the mirror.

Learning to control the angle at which the teeth strike the board is just as important, otherwise you may pitch the front of the saw—which is at the opposite side of the workpiece and difficult to see—so it cuts deeper than you intend, past your marks when making tenons or dovetails. The sense of angle comes with practice. Start by holding the saw with all the teeth flat on the bench. Memorize this feel and you'll be able to tell precisely where the saw's cutting edge is, and you won't be surprised by an overcut.

Before you begin, boards to be crosscut, tenons, and dovetail pins and tails should be marked out with a knife, gauge or pencil. You must, of course, decide whether you will split the line or cut to one side of it. In most instances, it doesn't really matter which you choose as long as you are consistent. When crosscutting a board or sawing a tenon shoulder, however, it is advisable to cut to the waste side of the line and then trim to it with a chisel or a plane.

Boards must be held firmly and at a height that will encourage a comfortable stance. For crosscutting, a bench hook or sawing board (for a bench hook, see *FWW* #13, p. 54) is helpful; it gives you a way to grip the board, while protecting the bench from a wayward blade. For tenons or dovetails, mount the work in the vise.

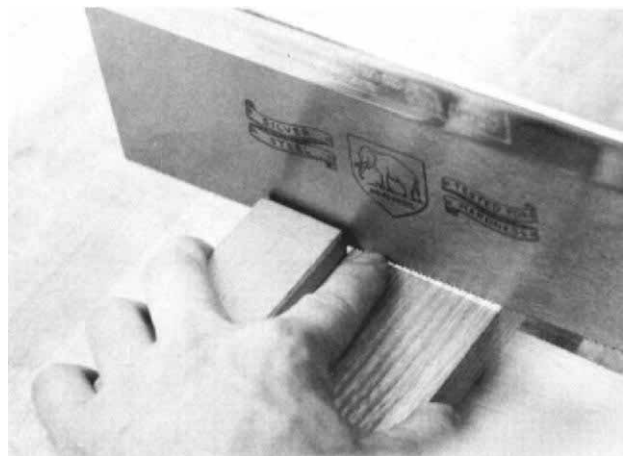
Whether you are sawing along the grain or crosscutting, the cut is started in the same manner. Place the saw's forward-most teeth on your mark at the far edge of the board, with the saw pitched up 10° or so at the handle end. Using your thumb and/or index finger to position and guide the blade, make your initial cut about 1/8 in. deep, then gradually pivot the saw down and carry the kerf over to the near side of the board. If you are crosscutting a board to length, complete the cut with the saw held flat in the kerf. Don't force the saw by bearing down on it. A steady hand and a light touch will give the best results.

To saw tenon cheeks, start the cut as before, but once you've carried the kerf over, pivot the saw down farther at the handle end and saw down the tenon cheek line facing you to the shoulder line. Don't lift the saw out of the kerf when you pivot it. Reverse the workpiece and saw down the other cheek line. Then hold the saw flat in the kerf and saw almost to the shoulder line. Complete a tenon by crosscutting the shoulders.

For dovetails, after starting the cut, keep the saw flat in the kerf, and saw to the knife line at the base of the pins or tails. Finish the joint by sawing the waste with a coping saw and



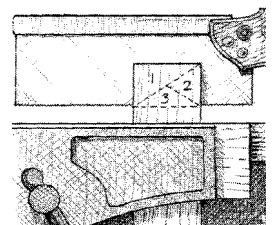
The fine teeth and thin blade stiffened by a brass or steel back make the backsaw an ideal joint-cutting tool. Backsaws are of two types; the larger are called tenon saws, the smaller are dovetail saws. Shown above are a 12-in. English-made brass-backed tenon saw, an 8-in. dovetail saw, and a 7-in. dovetail saw with the straight turned handle preferred by some craftsmen.



Kirby grips a board in a bench hook to demonstrate a crosscut. Start the cut by placing the saw's forward-most teeth on the mark at the board's far edge. Then tilt the saw up about 10° from the handle end and begin the cut with a slow, firm thrust. Use your index finger (not the bench hook's block) to guide the blade. Make the initial cut about 1/8 in. deep, then carry the kerf across the board to guide the saw and complete the cut.



To saw tenon cheeks, mount the workpiece in the vise at about a 60° angle as shown above and start the cut at the edge of the piece opposite you. Carry the kerf over, and without lifting the saw out of the cut, pivot it toward you and saw down the cheek line until you reach the shoulder. Reverse the workpiece in the vise and saw down to the other shoulder line.





To saw dovetails, clamp the workpiece upright in the vise, and hold the saw to match the tail and pin angle. Guide the cut with your thumb and, keeping the saw flat in the kerf, saw down to the line marking the base of pins and tails.

paring to the line with a chisel (*FWW* #27, pp. 74-75). Some woodworkers clamp the work in the vise at an angle so they can hold the saw vertical, but I think it's better to clamp the work upright and learn to control the angle of the saw.

A couple of recurring problems plague novices learning backsaw use. One is holding the saw at too great an angle to the wood when starting the cut and forcing it on the first stroke or two. Keep the angle about 10° and hold the saw with no more than its own weight on the wood, less than its own weight if starting problems persist. Another problem is learning just the right arm movement so that all but the three or four teeth at each end of the blade are used. Using only the middle four inches of the saw is inefficient, but burying the ends of the saw in the cut frequently jams the blade. Try sawing in slow motion to get a sense of where you should be taking the saw for optimum results.

As with any tool, practice is essential. A common fallacy is that you should make finished joints to practice with tools. The end results, of course, bear all the scars of bad workmanship. So practice first, and soon enough you will have the skills to use the backsaw to its fullest advantage. □

Sharpening the backsaw

Many woodworkers send their saws out to be sharpened. Yet sharpening a saw is as easy as grinding and sharpening a plane iron or a chisel, and we don't send either of them out.

Half the battle is won by having the correct tools: a saw vise, a setting tool and the right files. Vises are available from several mail-order tool outlets, or you can make your own out of wood (*FWW* #22, p. 63, and #38, p. 18). You can buy a saw set or make the simple anvil described in figure 2, a particularly good one for setting dovetail saws, whose teeth are usually too fine for commercially made sets. The Tool Works, 111 Eighth Ave., New York, N.Y. 10011, is one source for saw-sharpening files.

Tenon saws and dovetail saws have more teeth than regular handsaws, but they are sharpened in much the same way. Sharpening itself consists of four separate steps: topping, shaping, setting and sharpening.

Topping is essentially getting the teeth in a straight line so that none projects above its mates and all cut evenly. Use a straightedge to see if the teeth are of uneven height. If so, clamp the saw in the vise and file the teeth into line with an 8-in. or a 10-in. mill file held flat.

Shaping will restore the proper profile to any teeth flattened by topping. You are aiming both for uniform gullet depth and for the approximate profile of the other teeth on the saw or for the

profile shown in figure 1. To shape the teeth, use a slim or extra-slim, 4-in.-taper triangular file held horizontally and at right angles to the blade's length. Remove metal from both the front and back of the teeth.

To keep the saw from binding, the kerf must be about $1\frac{1}{2}$ times as wide as the blade itself. This is done by setting the saw—bending the outer half of each alternate tooth outward. Using the setting anvil shown in figure 2, place the

saw teeth on it so that their upper halves project just beyond the edge of the chamfer. Then, with a screwdriver (grind the blade down if necessary), set every other tooth, flip the saw end for end and set the rest of the teeth.

Sharpening is the final step. Before you begin, rub a piece of chalk over the teeth so you can keep track of which ones have been filed. Put the saw in the vise and, starting at the saw tip, work toward the handle. You can sharpen your backsaw as a rip saw, with the front and back of each tooth filed at 90° to the saw's length, or as a crosscut saw, with the fronts and backs alternately beveled. If you bevel the teeth, make the angle slight—less than 15° —or you'll remove too much metal and weaken the tooth. Whether you bevel or not, position the file in the gullets so you are filing the front of one tooth and the back of the adjacent tooth at the same time. Four to six light file strokes per tooth should do it.

Test your sharpening job on a scrap of wood. The saw should start easily and cut quickly and smoothly. If it grabs or catches, one or more teeth may be overset and should be dressed into line with a benchstone rubbed lightly along the side of the blade. If you get in the habit of sharpening your saws before they become too blunt, you shouldn't have to do anything but set and file the teeth. Topping and shaping won't be necessary.

—I.J.K.

Fig. 1: Tooth profile and sharpness angles

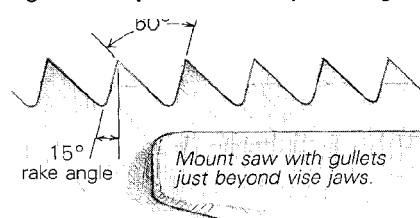
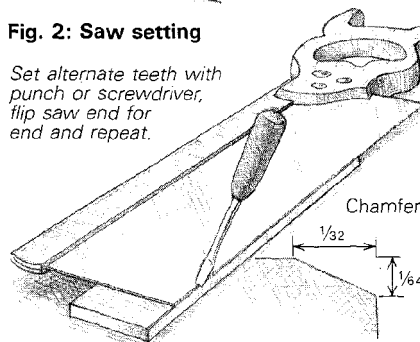


Fig. 2: Saw setting

Set alternate teeth with punch or screwdriver, flip saw end for end and repeat.



Make setting anvil of $\frac{1}{4}$ -in. steel bar stock, 2x10. Grind or file $\frac{1}{32}$ -in. chamfer.