



# From ROUGH

Using machines to remove cup, crook,

BY GARY ROGOWSKI

I have paid lumberyards good money for some nasty-looking hardwood. Sometimes you just have to take what you can find, even if the stock has defects. But I do have some faith in the power of machines. Planks that look like they were pried off the hull of a beached boat can be made silky smooth and straight as an arrow with the push of a button.

Well, almost. You can't blindly shove stock into the maw of a groaning machine and extract perfect boards. If you repeatedly pass the face of a twisted board across a jointer and don't apply proper pressure to the opposing corners, you'll end up with one big shingle—skinny on one edge and fat on the other.

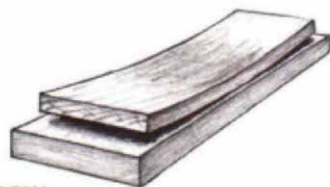
The first step in milling is looking, not machining. Examine your stock, and identify problems such as bow, check, cup and twist. Different defects call for specific

milling strategies. But even when you're careful to identify problems, surprises sometimes arise. Recently, while planing a plank of what looked like clear sycamore, I noticed a sudden color change in the machined face. I took a closer look. Smack in the middle of the discoloration was a chunk of buckshot. Fortunately, the soft lead didn't damage the planer's knives.

Although it may seem like more work, I prepare stock in two steps: rough milling and finish milling. First I pick through the

## WARPED VIEW OF LUMBER

As wood dries and ages, strange things can happen to it, even under the best of conditions. Identifying the problem is the first step in milling stock efficiently.



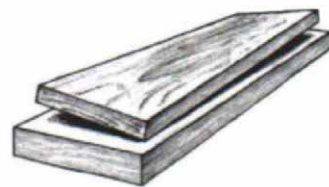
**BOW**

Bow occurs along the length of a board on the face side. If the bow is severe, it is best to cut the board into smaller sections before machining.



**CUP**

Cup occurs across the face of a board. If lumber is badly cupped, rip it into narrower sections; you'll end up with thicker stock after face-jointing and planing.



**TWIST**

Lumber with a slight twist will give you fits if not removed prior to cutting joints or gluing panels together. If it's severely twisted, cut the lumber into shorter sections for better yield.

# to Finish

## twist and other defects from lumber



stock and decide what boards to use for which parts of a project. Next I crosscut the pieces 1 in. oversize in length, rip them on the bandsaw, leaving them  $\frac{1}{8}$  in. over in width. Then I joint and plane the stock, leaving everything  $\frac{1}{8}$  in. over in thickness. When rough milling, I concentrate on the serious defects and don't worry too much about getting perfectly square edges yet. Then I sticker the stock for a few days to allow any hidden stresses in the wood to reveal themselves. Wood that's been sitting

in a rack may hold hidden surprises that show up after milling. After letting the stock settle down, I'll do the final milling—getting stock square and cutting it to the final dimensions. By then, the stock is usually pretty stable and less likely to play tricks on me.

The defects found in lumber are often a result of what happened to the wood before you bought it. As wood dries, even under ideal conditions, it suffers some degradation. Improper drying—too fast,

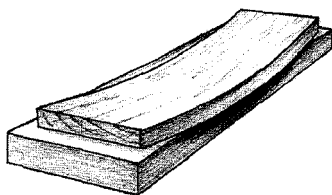
too slow, improper stickering and other mistakes—can play havoc with wood. Here are some of the more common problems and how to solve them.

### Use bowed stock for short pieces

Bowing describes a board bent along its length on the face side. Bowing isn't too great a problem if you need short pieces. You can dress the face of a short bowed plank until flat. But for long tabletops, where you need the thickness, bowing can

### CHECKING

Checks may occur throughout lumber, but they are most commonly found at the ends of a board (right), the result of too rapid drying.



### CROOK

Crook is a bow along the edge. You'll end up with waste along both edges when ripping it straight and parallel.



**Checks can be found anywhere.** Though they are most common at the ends of boards, checks may also occur in the middle of a board (top inset). In the case of internal checks, the problem may not be obvious until a board is crosscut (bottom).



## BOWED LUMBER

To determine whether a board is bowed, sight down one edge (left). Bowed boards are best used for shorter pieces of a project. Mark sections using a pencil while eyeballing the amount of bow (right). Next crosscut the board into shorter sections; then joint them flat, placing the stock bow side down on the jointer table (below).



Set the machine to take shallow cuts, about  $\frac{1}{32}$  in., for all face-jointing. The jointer will remove material at the ends first (right). Be careful not to exert too much pressure on the board, or you may temporarily press the bow out, resulting in a board that planes unevenly and isn't flat.



cause problems. One end or both will wind up too thin after repeated passes over a jointer. When a project calls for long pieces, and the lumber is bowed, select stock thicker than needed to allow for waste.

Face-joint bowed stock concave side down across the jointer. Severely bowed stock may catch on the outfeed table as soon as it passes over the cutterhead. If it does, lift the board onto the outfeed table.

Then push the stock through. Repeat until the board no longer hangs up. Alternatively, you can joint enough of a flat onto the rear of the board until the front end no longer catches. Don't exert too much pressure, or you may temporarily press the bow out. I set my jointer to take very light passes—about  $\frac{1}{32}$  in.—for all operations, even on rough stock. It's easier on the machine and easier on you. A bigger bite means

more vibration, which will reduce your ability to feed stock smoothly. I also use a push stick on the back edge of a board.

### Jointing a high spot

A board with a hump on one edge requires a balancing act to get a true edge. Place the board on the infeed table of the jointer, and put your weight onto the trailing end of the board. This will lift the lead end of the

board as it passes over the cutterhead. Slide the board along until it just starts to cut the hump. Then transfer all your pressure to the outfeed section of the board, which will lift the rear portion off the infeed table. Repeat until the stock doesn't rock and material has been removed across the entire face.

If your lumber has wild or swirling grain, often found near small knots, use a damp rag to lightly moisten the wood fibers before cutting. Take shallow passes when jointing or planing, removing less than  $\frac{1}{32}$  in. at a time. This will help avoid tearout. The same method works well for lumber with wild grain, such as curly maple.

### Taking the cup out of a board

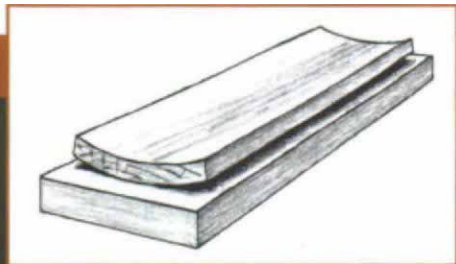
A moisture imbalance between two faces will cause a board to pull itself into a cupped shape. The side with more moisture will expand at a greater rate and become convex; the drier side will shrink and become concave. You can spot cupping by sighting across a board or by holding a straightedge across its face.

To flatten a cupped board, place the concave side face down on the jointer. Take light passes until the entire face has been touched by the cutter. Flatten the convex side by running the board through the planer, humped side facing the cutterhead, after face-jointing. When setting the depth of cut on your planer, reference it off the highest part of the cup.

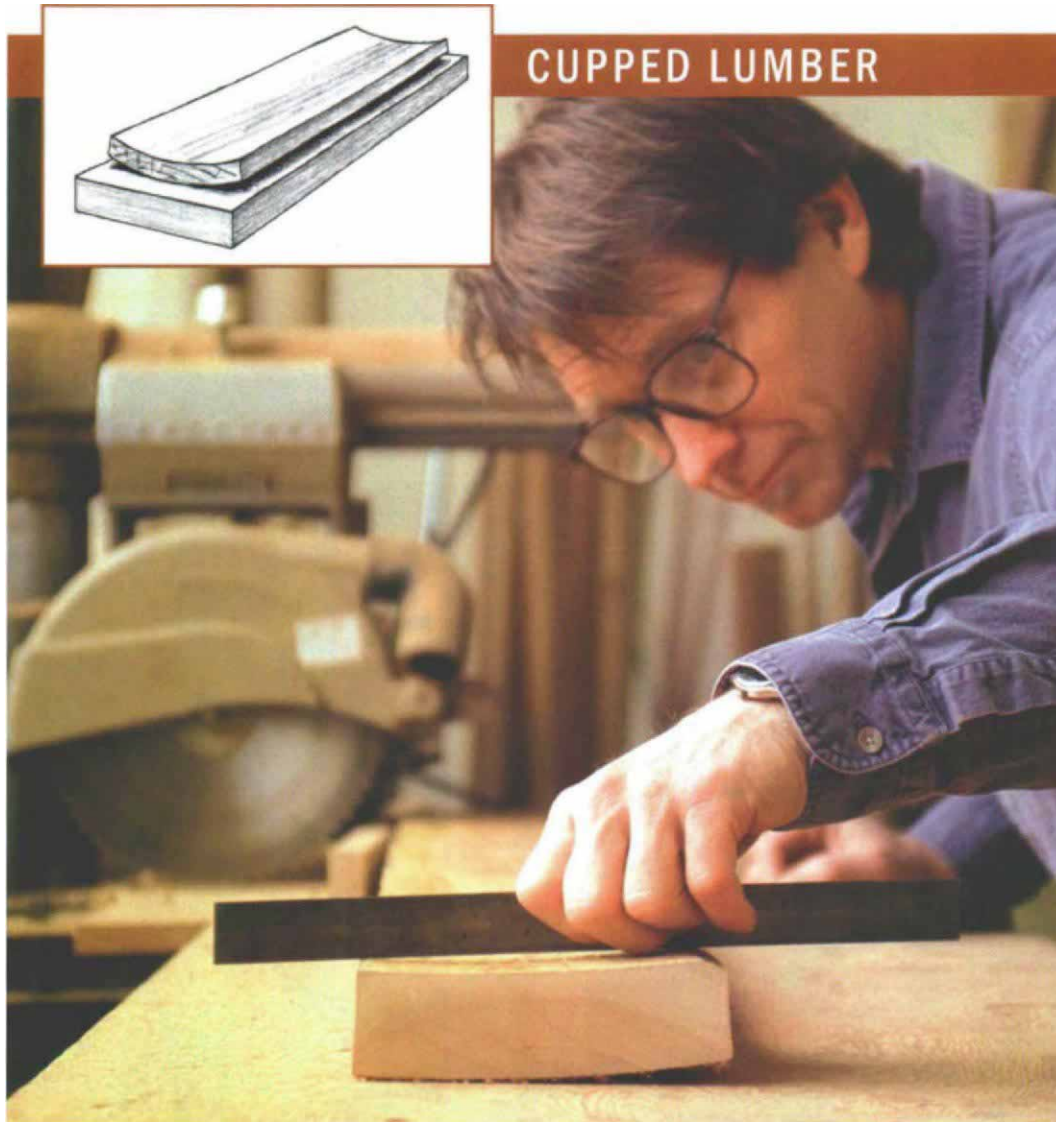
### Most rough lumber has checks in the end grain

End-checking or cracking is common in all lumber. As wood dries, moisture escapes faster from end grain than from the face or edge. That's why it's important to paint the ends of green lumber before drying it, which will help equalize the rate of shrinkage throughout the boards. Nevertheless, end-checking occurs frequently. When buying stock, factor in the loss of a few inches of length.

Although less common, lumber may also check along its surface, far away from the ends. This occurs more frequently in certain species such as oak. These checks tend to be narrow— $\frac{1}{8}$  in. or less. Lumber that has been dried too quickly may develop severe internal splits. These splits may be in the form of interlinked cracks called honeycombs or one large massive crack running the entire length of a board. You can sometimes spot a honeycombed section by

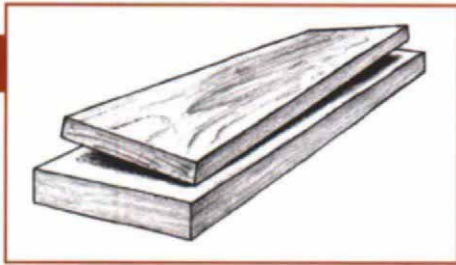


## CUPPED LUMBER



*A straightedge placed across the face of a board will indicate the amount of cup. Remove this flaw by placing the board cup side down on the jointer (left). The machine will take off material at the outside edges first (below). If the cup is severe, you may end up with stock that's too thin. To avoid this, rip the stock into narrower strips on a bandsaw before face-jointing.*





## TWISTED LUMBER



### Winding sticks help identify twist



Winding sticks are simple but accurate tools that help you spot twist in lumber. They're handy for truing up other surfaces as well, such as your bench or jointer tables. Mill up two sticks about 1 in. by 2 in. by 24 in. Make sure that the wood is dry, knot-free and straight and that the two pieces come out the same size. Mark along the edge of one stick using a dark marking pen, or for fancier sticks, make an inlay of darker wood.

To use the sticks, place one on each end of a board. Move away, and then hunker down and sight from the top edge of the near stick to the top edge of the far stick. If the two sticks are parallel to one another, the board is flat. If the sticks are tilted with respect to one another, the board is twisted. To remove twist, the board is face-jointed, and the high corners are removed first. —G.R.

**Use winding sticks to check lumber for twist.** Lay the sticks across the board at opposite ends, and sight down the board. If the sticks aren't parallel, the lumber suffers from twist.



**Removing twist on the jointer.** This is accomplished by taking a diagonal cut across the face of a board. Begin by pressing the lead high corner flat to the table. Gradually transfer pressure to the trailing high corner as the board passes across the cutterhead. Don't let the board rock onto the low corners, or you will remove material where you don't want to.



looking for a bulge on the face of a board.

There are various methods for dealing with checked lumber. For a simple solution, cut off the afflicted sections, and use them for firewood. Some woodworkers celebrate these natural flaws by filling them with colored epoxy resin or cutting a butterfly key to stabilize the crack.

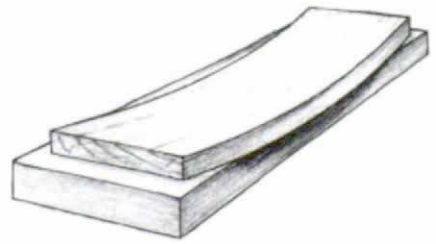
### Gone with the wind

A twisted board is the most sinister of defects. Slight twist—also commonly referred

to as wind—may go unnoticed until you begin face-jointing a board and realize too late that you've created a taper. When you try to correct it by more face-jointing, you may end up with stock that's too thin at one end.

Check for twist by sighting down one end of a board to the other. If one corner appears higher than another, the board is in a twist. Tools called winding sticks are a foolproof way to help you spot twist (see the box at left). A flat surface such as a

## CROOKED LUMBER



**Crook can be safely removed using a bandsaw.** Use a batten or any straightedge the length of the stock, and mark the area to be removed with a pencil. The author prefers using a bandsaw for all rough-ripping because there's no chance of kickback.



workbench also can be used as a tool to look for wind. Place the lumber face down, and push on the adjoining corners. If the board rocks, it's twisted.

If lumber has other faults besides twist, such as bow or cup, deal with the twist first. Place the board on the infeed table of the jointer, and press down on the low corners. Exert greater pressure at the front of the board at the beginning of the cut; then transfer pressure to the rear as it approaches the cutterhead. The board will

be cut across a diagonal line from one high corner to another. Repeat until the board is flat.

### **Remove crook with a saw**

Think of crook as a bow along the edge of a board. The same problems encountered when jointing bowed lumber may occur with crooked boards. First crosscut the stock into approximate lengths needed for a project, then rip the boards slightly oversize using a bandsaw. This will make it eas-

ier to joint an edge straight without wasting a lot of wood.

As with bowed wood, if you're having a problem with the stock catching on the edge of the outfeed table, place the leading edge of the board on the outfeed table, just past the cutterhead, then push it through. Continue until the board no longer catches, jointing it in the usual way.

*Gary Rogowski is the author of Router Joinery (The Taunton Press, 1997).*