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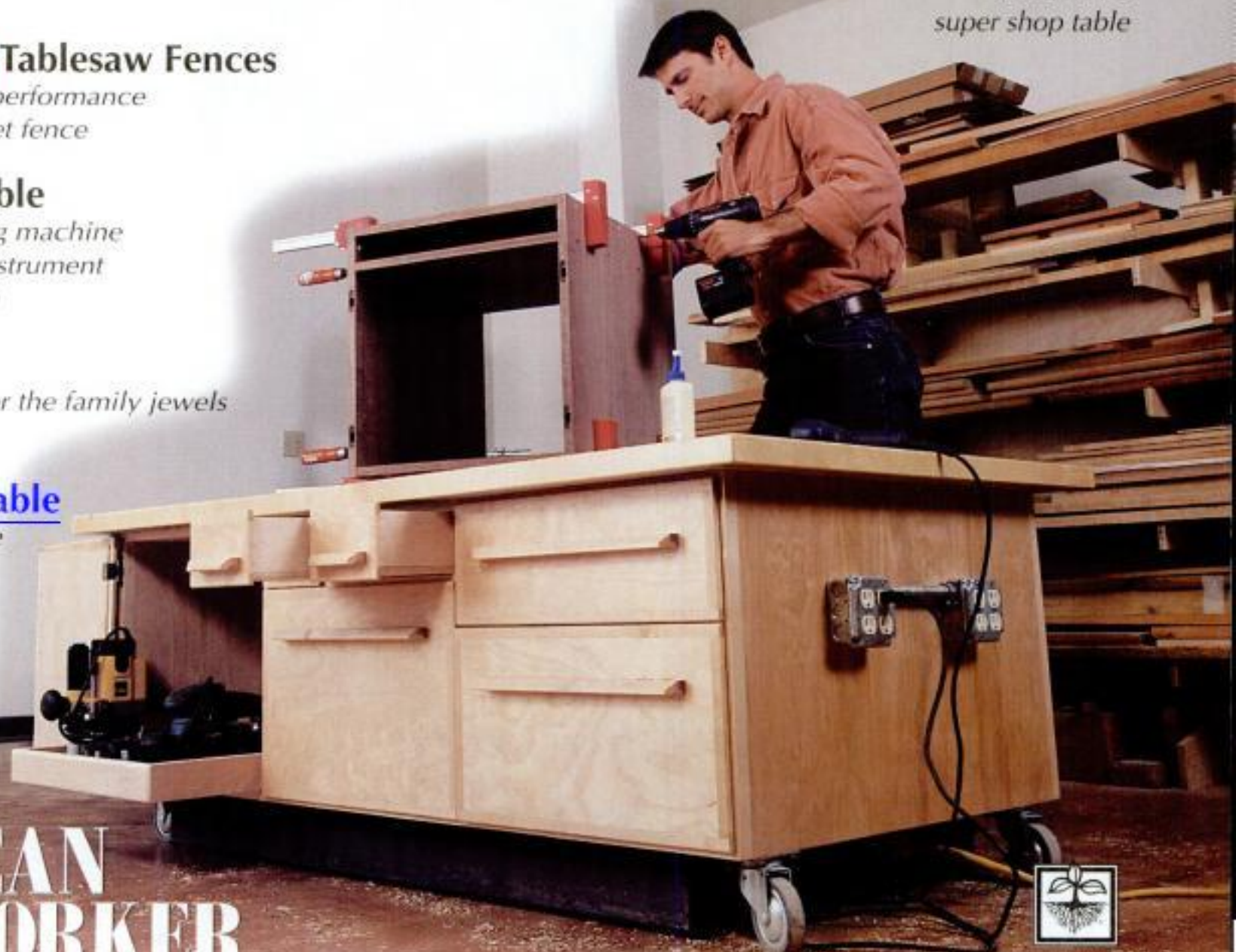
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# AMERICAN WOODWORKER



A RODALE PRESS PUBLICATION



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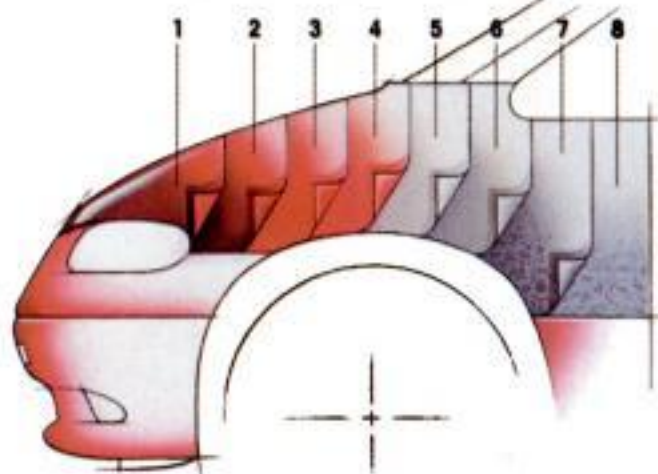
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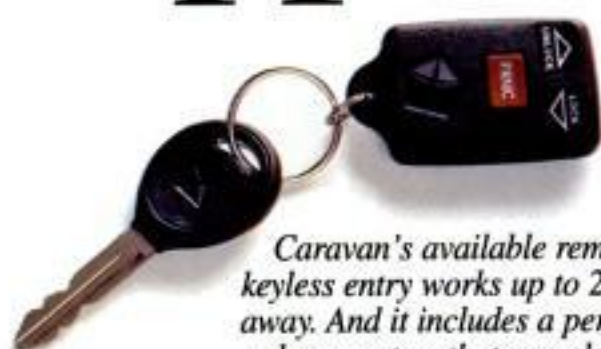


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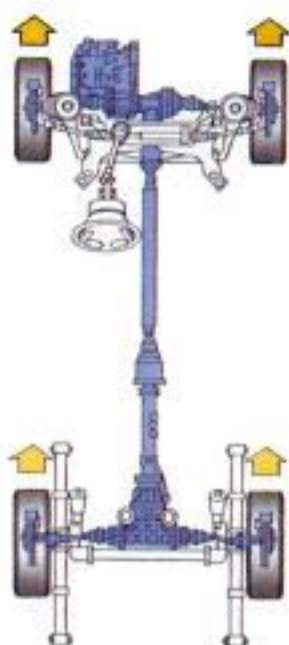
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## Working Smart

*It pays to follow a few simple rules*

**W**hile in California recently, I heard an unnerving story from Carol Reed, one of the woodworkers we featured in an article on women in woodworking a couple years back (AW #49). It seems one of her students forgot to tighten his router base after changing the depth setting of the bit. Murphy's Law could have predicted the outcome: The router motor ended up spinning out of control on the shop floor, mangling power cords and sending everyone scrambling for cover. That poor guy will never forget to tighten a router base again in his life. At least he still has all his toes; some people aren't so lucky.

Everyone makes mistakes—you can't avoid them. If you could, you'd be missing out on some of woodworking's most valuable and indelible lessons. You also wouldn't have as many amusing stories to swap with your woodworking pals.

No amount of study or preparation can protect you from the occasional blunder, but you'll work more safely and efficiently in the shop if you follow a few ground rules:

● **Know your limits and respect them.** It's okay to "push the envelope" (attempt to go beyond your abilities), but don't do it without getting instructions or advice from someone you trust.

And, *never* try to push a power tool beyond its limits.

● **Expect the unexpected.** If you don't have much experience with a technique, assume anything could go wrong. Make sure you're out of harm's way if it does.

● **Think things through.** Plan each step of your project before you begin, so you won't have to stop and adjust your game plan as you work.

Working smart is well worth the effort. You'll be rewarded with less frustration, more time to devote to other projects and, hopefully, fewer mistakes.

*Ellis Valentine*  
Executive editor

### PLAY IT SAFE

Woodworking can be dangerous. Safety equipment can greatly reduce your risk of injury; so can common sense and caution. Remember, if a procedure feels dangerous to you don't try it—find a safe alternative. Your safety is your responsibility.



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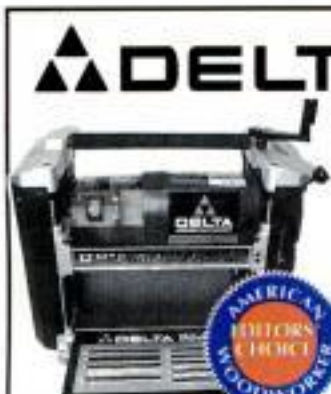
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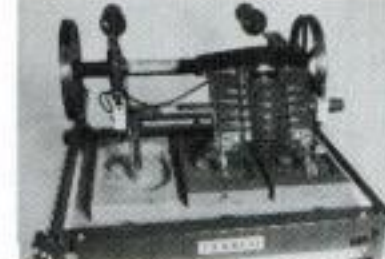
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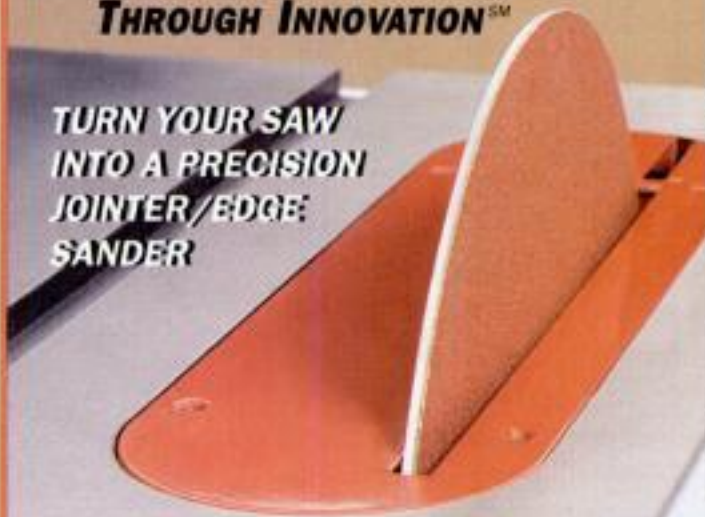
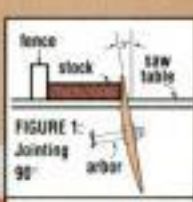
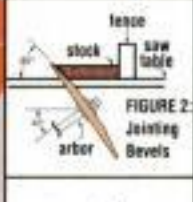
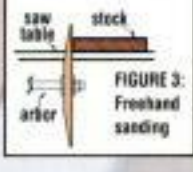
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CIRCLE NO. 19 ON PRODUCT INFORMATION FORM



# Radial-Arm Saws: To Rip or Not To Rip?

If radial-arm saws are not suitable for ripping, as Bernie Maas claims in AW #59, perhaps he can explain why lumberyards and major construction sites use them for this purpose. Maas ignores the force of gravity that will reduce the uplift force of the blade and, in some cases, outweigh it altogether.

The radial-arm saw can be dangerous for ripping lightweight, thin or narrow material, where you cannot safely apply any hold-down force near the blade with your hands or a stick. But it gets safer to use for ripping as the weight of the material increases.

I often rip material shorter than 22 in. long, if it is wide enough for my hands to pass the blade with a safe margin so I can press down both the leading and trailing edges of the panel.

Peter Scott  
Regina, Saskatchewan

I have had a DeWalt radial-arm saw for about 35 years, and I can rip wood so thin you can twist it into a knot without breaking it (depending on the wood, of course!). I also plow, mold and shape with my saw.

To rip, I place the blade guard so the work will just pass under it and lower the anti-kickback arm so the fingers are about 3/32 in. below the surface of the work. I use a rip blade and usually install a spring-steel hold-down behind the blade to keep the work from rising during the cut. Since radial-arm saws have a tendency to climb, everything must be good and tight. If there is any kickback, the anti-kickback fingers will prevent the work from shooting back toward the operator.

In my experience, this is only possible with saws made by DeWalt or Delta—where the saw yoke is an upside-down “U.” They are very strong and there is no play. On lower-grade

saws, the yoke is in the shape of a “C,” and the arms are made of stamped steel. These aren’t really rigid enough to even crosscut decently.

Everett N. Cool  
St. Johnsville, NY

In his reply to Gerald Cato, Professor Maas so exaggerates the muscular effort needed to rip safely on the radial-arm saw that one wonders if he has ever used that machine for anything but crosscutting—few professionals have. In fact, the effort required is about the same as that required for a jointer.

Based on over forty years of injury-free experience, my advice to Mr. Cato [for ripping on the radial-arm saw] is:

1. Use an uncut, straight fence so the workpiece doesn’t get caught in the crosscut kerf.
2. Do not use a splitter plate. It is almost always misaligned with the blade and makes the work hang up in the middle of the cut.
3. Don’t use any kind of guard that your machine has in front of the blade.
4. Stand in front of the machine as if you were crosscutting. This gets you out of the path of any possible kickbacks.
5. Use a notched push stick to grasp the end of the stock.
6. When ripping short pieces—say, 10 in. or less—clamp the wood to the table and use the blade in the crosscutting mode.
7. To plow a groove with the grain, set the dado head horizontal. It may be necessary to drill a hole in the table to accommodate the end of the arbor. Use a high fence with a slot to fit the dado head. The forces here are the same as those on the tablesaw.
8. Use the same setup for rabbeting, but add a horizontal projection above the slot to keep your fingers out of the blade. Also—more for accuracy than

for safety—add hold-downs in front of and behind the blade to keep the work pressed to the table.

Finally, I remind Professor Maas and Mr. Cato’s “friends” that kickback is a danger on any machine with a rotating cutter—even a router—and is a major cause, if not the principal cause, of tablesaw injuries.

J.T. Curtis  
Murfreesboro, TN

*Bernie Maas replies:* No matter how much weeping, wailing, and chest-thumping that’s mustered on behalf of the radial-arm saw, I’m not going to change my stance vis-à-vis ripping on that machine. The radial-arm saw is simply not the safest nor most efficient piece of equipment for that job.

My position is based on neither theory nor supposition, but almost forty years of experience. I’ve ripped and plowed more lineal feet on the radial-arm saw—both at home and at school—than I care to remember. Early on, it became patently clear that ripping with any degree of surety on the radial-arm saw meant hopping through a series of hoops. Your letters underscore what I’m talking about:

1. You must out-muscle the machine.
2. You’re limited to stock of specific sizes and configurations.
3. You must jury-rig the machine with the skill of a rocket scientist for ripping.
4. You must perform heart-stopping gymnastics as you feed the stock.

At one point I also believed that the radial-arm saw was some sort of “renaissance” machine. But, in the early 1970s, I decided that it was time to put that notion behind me—I invested in a Delta Unisaw. Finally, white-knuckle ripping was a thing of the past. No more hold-downs, special jigs, and what have you—I just yanked

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## LETTERS

up the splitter/anti-kickback combo, dropped down the Uniguard, set the fence, and ripping became what it should be—a pleasant, if somewhat repetitive, woodworking exercise—instead of the game of strategy it is on the radial-arm saw.

Regarding contractors and lumberyards using radial-arm saws for ripping: As a counsel for the defense in an injury case inadvertently put it while I was an expert witness on behalf of a fellow who had a couple of fingers knocked off, "Safety is not always a paramount consideration on a commercial site."

### Thumbs Down on Plastic Jigs

In regard to Chuck Van Winkle's letter about the Sears Premium Dovetail Jig titled "Nothing Wrong With Plastic" (AW #52), my own experience with this jig has left me very frustrated. First of all, the plastic templates are very unforgiving. Although the instructions state that the router must be stopped and/or not raised while running, I

made the mistake of raising the router slightly. The bit cut right through the plastic template without the slightest effort. Ruined.

My frustration continued when I found that you need a special  $\frac{9}{16}$ -in. dovetail bit to make a through joint. No one makes this size bit except Sears, and it's available only through their catalog, as I discovered after going to four stores. Needless to say, my project came to an abrupt halt.

I suggest that the templates should be made of metal and that there should be a note on the package to alert customers of the need for a special bit, so they won't expect to bring the unit home and use it straight from the box.

Larry Gamache  
Windsor Locks, CT

### Hard-to-Find Part



I decided to build your pneumatic drum sander (*Shop Solutions*, AW #59) for my shop, but I had some difficulty finding a

"2½-in. motor flange," as indicated in the plan, for mounting the drum. I discovered that the proper name for this part is a "split-taper pulley bushing," and it is available at industrial supply houses. Most come with a keyway channel in the bore. Since the item is mild steel, a hole could be drilled and tapped for an Allen screw to secure the drum to the shaft.

Bob Shorthill

### Routing Plywood Cleanly



I read Roger Cliffe's suggestions for avoiding shredded edges when routing plywood. In my shop, we use Freud ¼-in. solid carbide up-spiral bits and rout from the back side of the plywood so that the bit cuts up into the good side. The spiral design pulls the grain up into the wood and shears it off cleanly. These bits have long cutting edges, so it's easy to move them up or down to find a sharp spot when they start to wear.

Larry Cherniak

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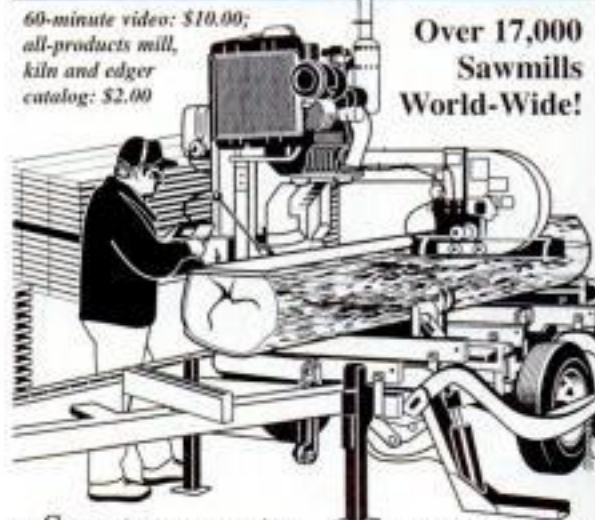
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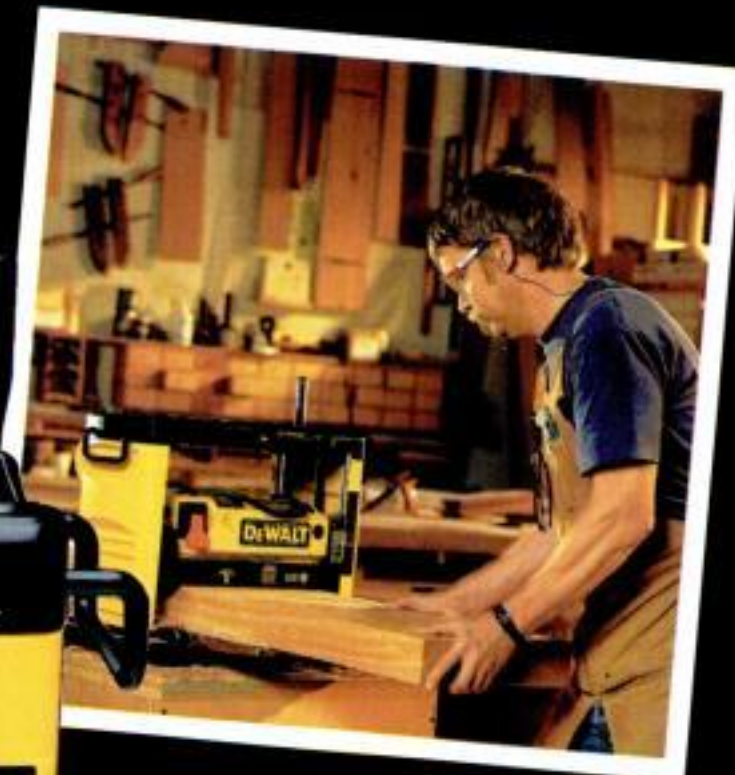
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## A Dying Art

Thank you for the article on Japanese blades in AW #59. Unfortunately, the reason the best grades of hand tools are disappearing in the U.S., Europe and Japan is economic. It is difficult or impossible to argue why a craftsman should pay \$1,600 for a handmade handsaw, instead of getting a floor-model circular saw for the same money. A new, factory-made handsaw costs about \$30. With disappearing demand for the tools comes the sad disappearance of the skills of the world-class craftsmen who produce and doctor these tools.

On another note, in the photo on page 96, Mr. Hirota is not flattening the saw on the board, as the caption states—he is scraping it to thickness. The ryoba saw will be thickest at the cutting edges and thinner in the center of the blade. It will also be thinner at the end of the blade away from the handle (closest to Mr. Hirota's chest in the picture) and thicker at the tang end, which will end up inside the wooden handle. Hand scraping of

handmade saws is an art form that is rapidly disappearing as the oldest masters grow too old to work and the younger folks can't make a living at it.

R. Peter Cowick  
Ft. Lauderdale, FL

*Toshio Odate replies:* Mr. Cowick is correct. Hirota is scraping the blade to make it thinner in the center so that it will generate less friction in cutting.

## Non-Bleeding Cedar



I read the Q&A in your June issue about the bleeding problem with Spanish cedar. Most of the Spanish cedar imported into the U.S. is *Cedrela odorata* from South America. It frequently has this problem and can sometimes bleed for years. Some lumber dealers claim that the pitch can be "set" by running the kiln up to 200°F, but this runs contrary to our experience.

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Bill Rubenstein

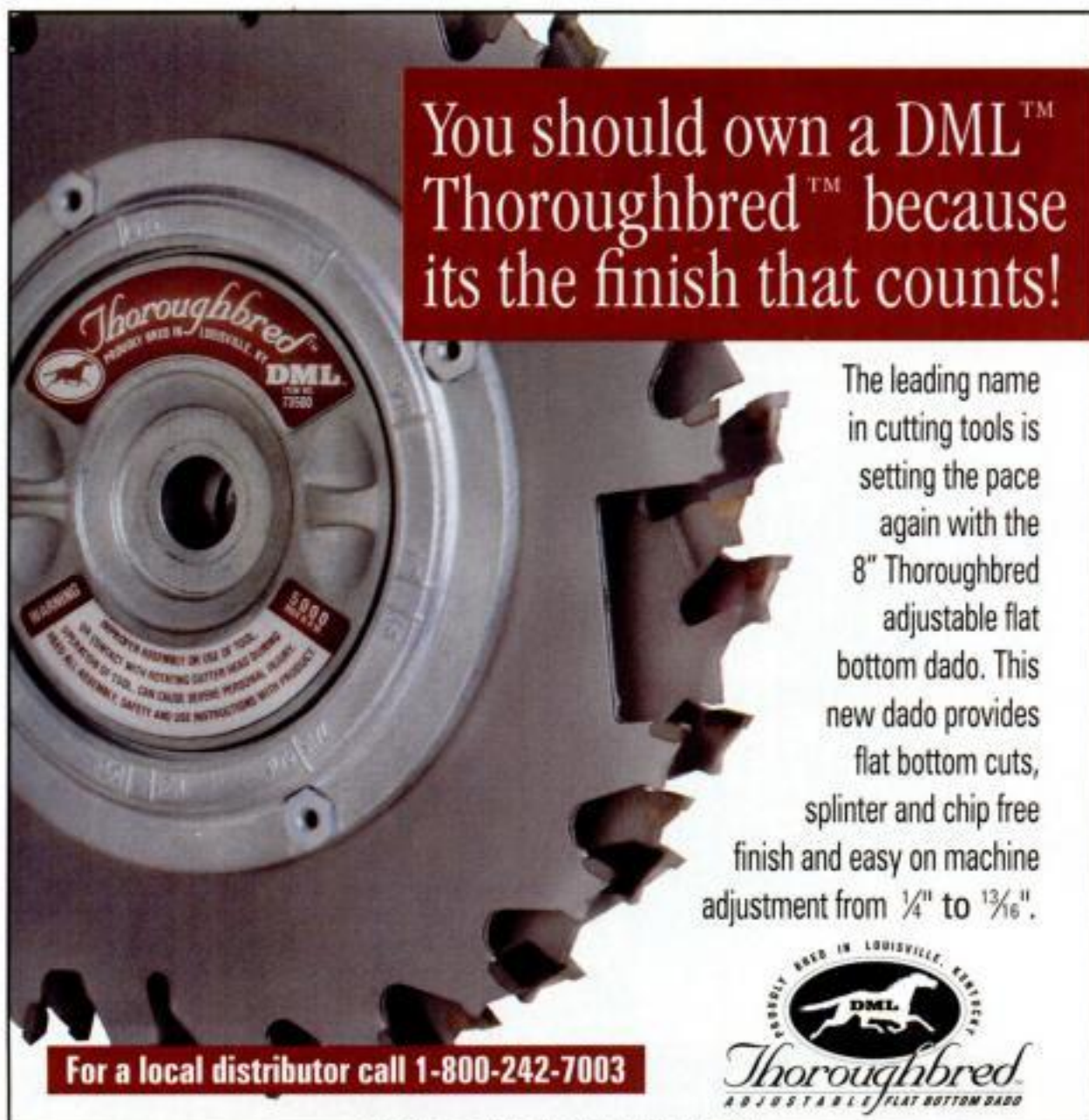
## Body by Fisher

I was thrilled to see the photo of George Fath's Napoleon-style coach in "Gallery" (AW #59). In 1937, at sixteen, my father, W.D. Ford, built an identical coach for the Fisher Body Design Competition. His model won first place in several regional competitions. By the way, this coach is the one shown in silhouette on the Fisher Body emblem.

William B. Ford  
Tulsa, OK

## Correction

In AW #60, photos for *Tool Till* and *Choices for Cabinet Doors* were taken by Paul Pearson.



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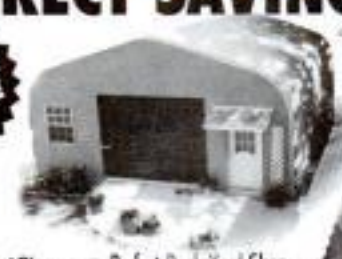
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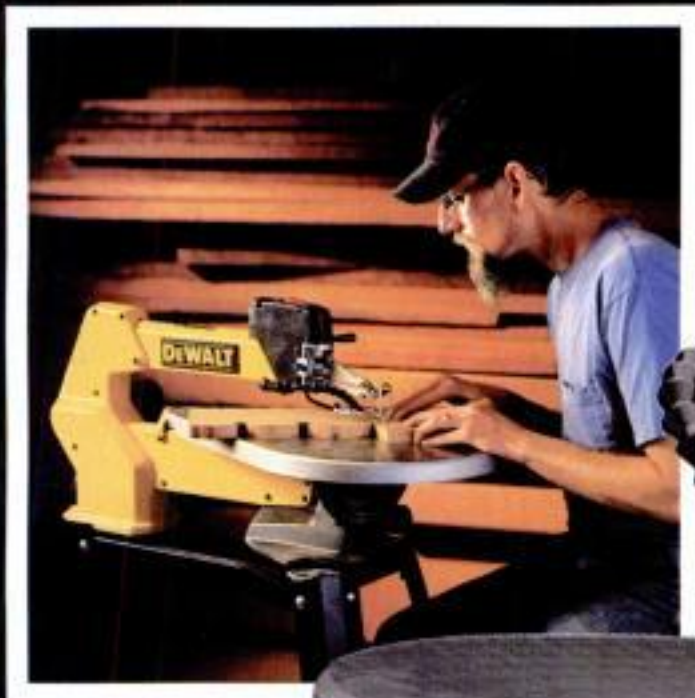
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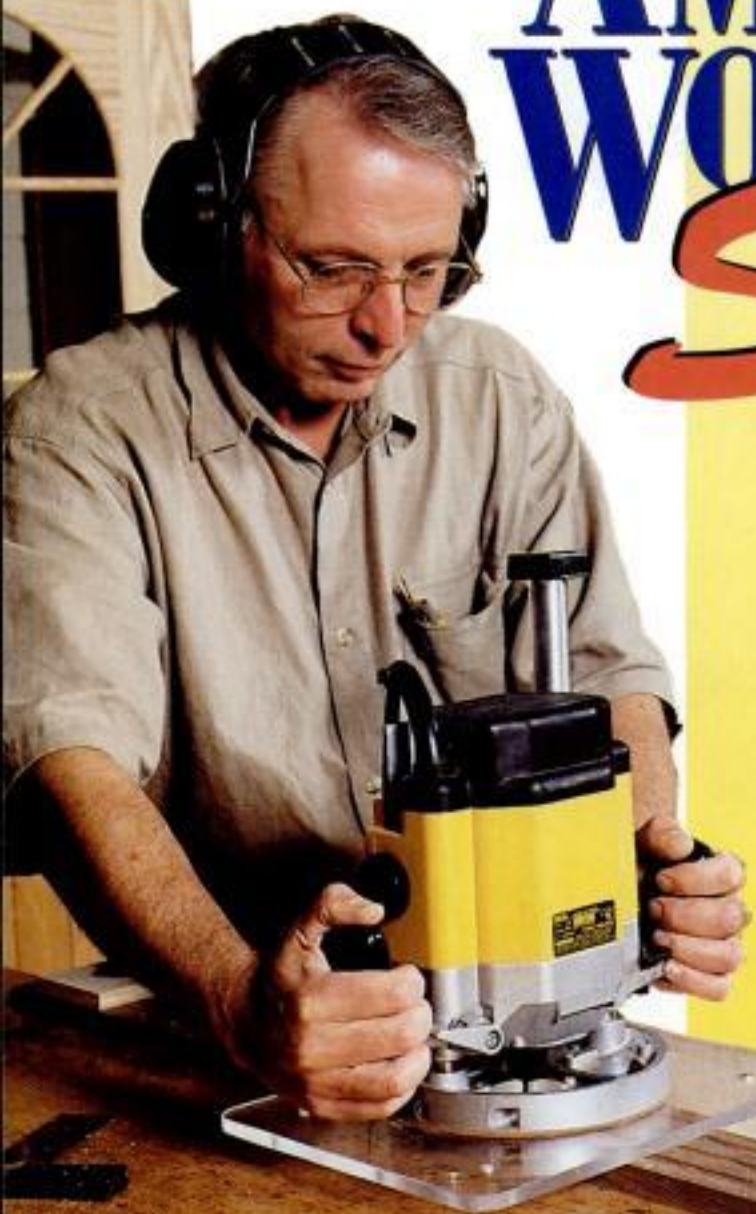
# Where Great

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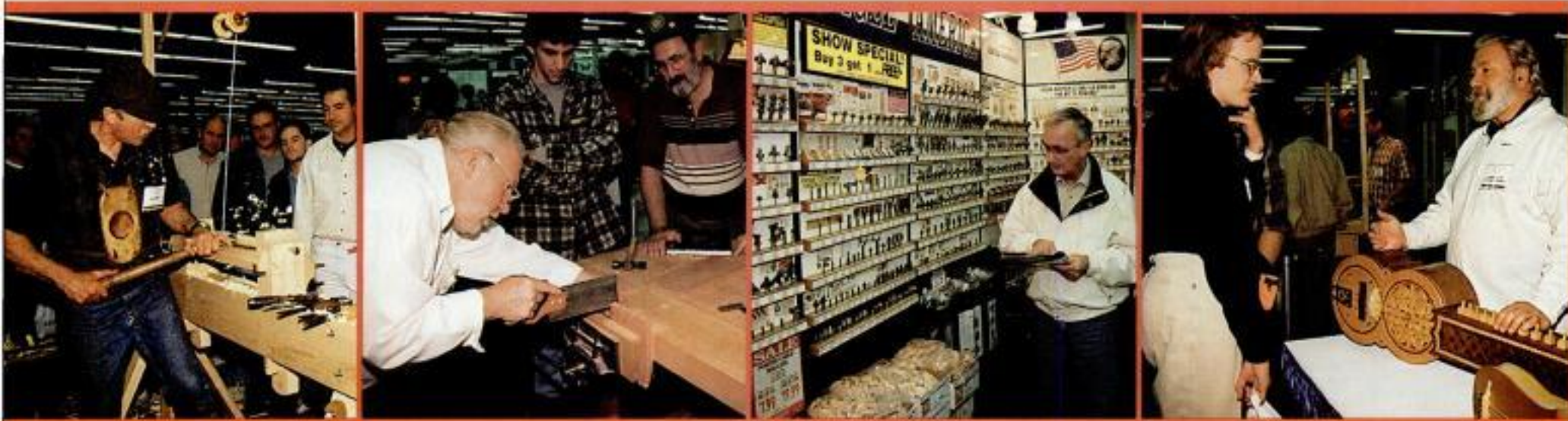
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**About the presenter:** Ernie Conover has been a woodworking teacher and demonstrator for 20 years. He and his wife Susan run Conover Workshops, a woodworking school in Parkman, OH.

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*Mark Duginske*

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**Who should attend:** All woodworkers

**About the presenter:** A fourth-generation Wisconsin woodworker, Mark Duginske is a prolific writer, designer and inventor. His work has appeared in numerous magazines and books, including *Cutting Shapes and Profiles* (Rodale Press, 1997).

#### SHARPENING SECRETS

Friday 4:00pm-6:00pm  
Saturday 8:30am-10:30am

*Leonard Lee*

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**About the presenter:** Author of books and magazine articles on planemaking and sharpening, Leonard Lee has been a woodworker for over 35 years. He is president of Veritas Tools Ltd. and Lee Valley Tools.

#### DESIGN AND BUILD GREAT FURNITURE

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*Ian Kirby*

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**About the presenter:** Trained in England as a furniture maker, designer and wood technologist, Ian Kirby has taught and written extensively on woodworking in the United States and England for over 30 years.

#### FEARLESS FINISHING

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**About the presenter:** A contributing editor of *AMERICAN WOODWORKER* magazine, Michael Dresdner writes our "Just Finishing" column and hosts our finishing "chat room" on the America Online computer service every Sunday night. He is the author of *The Woodfinishing Book* (Taunton Press, 1993).

#### SETTING UP SHOP

Friday 8:30am-10:30am  
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*Sandor Nagyszalanczy*

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**Who should attend:** Beginning to intermediate woodworkers

**About the presenter:** Furniture designer and author of four books, with 18 years of woodworking experience and six years as an editor of *Fine Woodworking* magazine, Sandor Nagyszalanczy writes and lectures frequently on woodworking topics.

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3. Winner selected by random drawing from eligible entries on or about March 23, 1998. Odds of winning depend on the number of entries. Winner will be notified by phone and/or mail. Winner will be required to sign and return an Affidavit of Eligibility and Release within 14 days of receipt of notification. Noncompliance or return of any prize notification as undeliverable, will result in the disqualification of the entry and selection of an alternate winner. The winner must consent to the use of his or her name and/or likeness for promotional purposes without additional compensation, except where prohibited by law.

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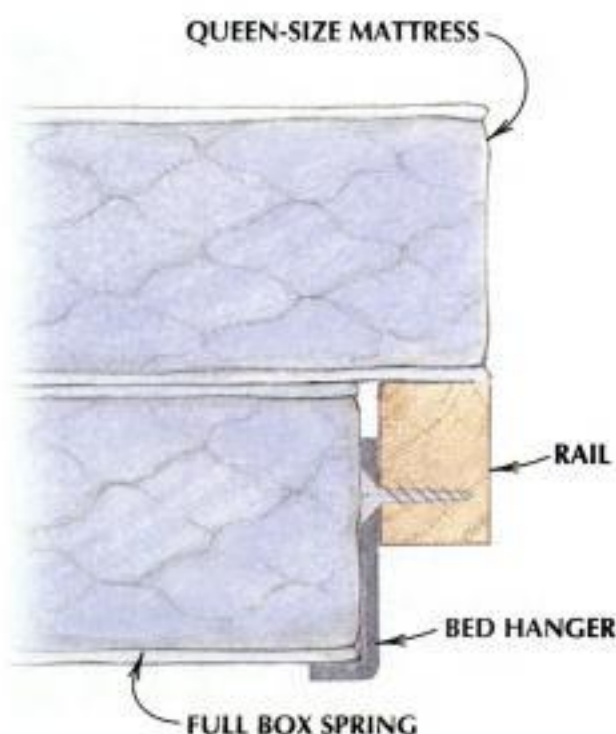


# Making a Tidy Queen-Size Bed

**Q** My wife and I made a deal: I'd make her a queen-size four-poster bed if she'd make me a new quilt to go on it. As usual, she finished her part of the bargain first. When she put the new quilt on our old bed, we noticed a disturbing bump along both sides of the bed, where the quilt drapes over the bed's side rails. She wants me to fix this on the new bed. Any ideas?

Bart Mavis  
Essex Junction, VT

**A** The easiest way to do this is to buy a box spring one size smaller than your mattress. A queen-size mattress measures 60 in. wide by 80 in. long, but a full-size box spring measures



only 54 in. wide by 75 in. long. The space created by the overhang gives you room to inset the side rails.

As shown in the drawing at left, the box spring rests on bed hangers, which are available in three heights (3½ in., 6 in. and 7 in.) from Fancuil Hardware, 603-898-7735. I screw three bed hangers to each side rail. The mattress fits snugly between the posts at the headboard and footboard but extends to the outside of the side rails. The box spring will be a couple of inches short at the head and the foot of the bed, but I haven't found this to be a problem.

Phil Lowe  
Furniture maker  
Beverly, MA

## The Best Wood for Steam Bending

**Q** I've been told not to use kiln-dried lumber for my steam-bending projects. Is this true?

Greg Miller  
Mason City, IA

**A** What you've heard is right. The kiln-drying process drives off the bound water in the wood's cells, greatly reducing its ability to stretch on the outside of a bend. Kiln-dried lumber is the most likely to split when you bend it.

For better steam-bending success, use green or air-dried wood. And for the best luck, use riven stock, not sawn stock.

To rive wood, you split it from the log in a controlled manner. Riving follows the grain, so the same layers of annual growth will run the entire length of the part.

**Riving, or splitting lumber along the grain, produces superior bending stock. Start the cut with a hatchet or a club and wedge; then open it with a froe, as shown here.**



This way, there are fewer places where the grain "runs out" compared to sawn lumber—and fewer potential splits.

Michael Dunbar  
AW contributing editor  
Hampton, NH

## Running American Tools in Europe

**Q** I am moving to Europe, where the electrical supply is 220/240V and 50 Hz. How well will my 110V, 60-Hz American tools operate there, hooked up to a voltage converter?



Bob Grundig

**A** It depends on the type of motor. Induction (brushless) motors, such as those found on tablesaws, are more prone to damage. If the motor nameplate doesn't specifically state "for operation at 50 Hz," even if it's connected to a converter it could overheat and fail from "saturation." Some people run their tools this way anyway—they just don't run the machines continuously, and they recognize that the motors get hotter more quickly.

To assess the risk of damage, measure the no-load current of each tool with an ammeter (available at electrical supply stores and at Radio Shack) before you leave for Europe, and do the same thing once you get there. If the current increases less than 5% on the same volt-

age, chances are the machine will run OK. It will, however, run only five-sixths as fast as usual—the difference between 50 and 60 Hz.

Universal motors—the type with brushes that you find in small corded and cordless drills—are usually fine as long as you use a converter to keep the voltage at 110V.

Martin Seifert  
Electrical consultant  
Colgate, WI

## A Slip-Proof Floor Finish

**Q** My wife just opened a ballet studio in an old ballroom with a hardwood floor. I sanded the floor and applied two coats of a non-slip gym seal, but it's still too slippery for kids in ballet slippers. For the time being, I've been applying a mixture of carbonated soda and scouring powder every day before class, but cleaning up afterward is a drag. Help!



D. Decker

**A** Here is a sure-footed solution that will work as well in your woodshop as it does in the ballet studio. Apply another coat of varnish, this time with a non-slip additive mixed in. You can find these additives at paint or marine supply stores. Most of them are made of sand or (my favorite) powdered walnut shells.



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| 602-500 | Edge Beading      | 1/2"        | 7/8"         | 3/8"         | \$34.90 |
| 602-502 | Edge Beading      | 1/2"        | 1"           | 9/16"        | \$37.90 |
| 602-504 | Edge Beading      | 1/2"        | 1-1/8"       | 3/4"         | \$39.90 |
| 855-503 | Lock Miter        | 1/2"        | 2-3/4"       | 1-3/16"      | \$69.90 |
| 655-502 | Lock Miter Jr.    | 1/2"        | 2"           | 13/16"       | \$59.40 |
| 806-690 | SuperDuty Fl.Trim | 1/2"        | 3/4"         | 2"           | \$39.90 |

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See page 23 for more great Jesada products!

CIRCLE NO. 38 ON PRODUCT INFORMATION FORM

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Stir the additive into the varnish, then apply it normally. More additive will make for a rougher floor, but start with the guidelines on the container. In my own shop, which has a concrete floor, I add walnut shell powder to epoxy paint and create large "sure-grip" patches in front of all my major machinery.

Michael Dresdner  
AW contributing editor

### Learning the Business of Woodworking

**Q** I keep reading articles about successful woodworkers who run their own shops for a living. Aside from inspiration and logging plenty of hours in the shop, how can I prepare for starting my own business?



Michael LeMire

**A** The best way to learn the business is to seek employment with a professional whose work you admire. Look for furniture makers who are doing the

kind of work you'd like to do someday. Don't go to work for anyone whose work doesn't meet your own standards.

Be prepared to work long, sometimes tedious hours, and to initially do a lot of "grunt" work—sanding, general shop chores, basic finishing, deliveries, etc. If you keep your wits about you and observe your boss carefully, you'll pick up vital skills. By doing quality work in a timely and efficient way, you'll win your boss's respect. And as your skills improve, he or she will let you tackle more demanding (and skill-building) tasks.

If you can take the demanding pace and modest pay, you'll learn lessons that you'll never forget. I went through this process in several different shops, acquiring new skills with each new employer. And I can't thank them enough for all they taught me.

One essential tip: Look for a shop that has 10 or fewer employees. This way, you'll avoid the production-line mentality and stand a better chance

of learning the whole gamut of necessary skills, from milling and machine work to hand-tool use, joinery and fine finishing.

Andy Rae  
Associate editor of AW

### Preventing Rusty Tools

**Q** My workshop is only heated when I'm using it. The changes in temperature from turning the heat off and

#### How do I submit a question that needs an expert answer?

Send your question to "Q&A," AMERICAN WOODWORKER, 33 E. Minor St., Emmaus, PA 18098.

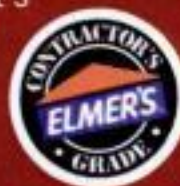
**Q&A Online!** You can e-mail your queries to AWQA@aol.com. Plus, consider posting your questions on one of our message boards, easily accessible from the AMERICAN WOODWORKER Online site at America Online. See page 26 for details.

Howard Packer, Newtown, CT, General Contractor

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on have caused condensation—and now rust—on my saw table and other unpainted surfaces. Is there any way to keep this from happening again?

Robert Dietrich  
New Bremen, OH

**A** First, remove the rust by scrubbing the surface with Scotch-Brite™ or 0000 steel wool and some paste wax. Add a little mineral spirits to the wax to help free up rust particles.

When the rust is gone, rub on a thin layer of paste wax to help keep rust from occurring again. A periodic application of wax helps a lot—and it also reduces workpiece feed friction. If rust continues to be a problem, buy a dehumidifier for your shop.

Paul Anthony  
AW Shop manager

### Cleaning a Dirty Turning

**Q** I recently bought a small natural-edge bowl that was turned from African blackwood. The white sapwood

around the top has developed greenish-black smudges, I believe from people handling the bowl. How can I remove the smudges without hurting the finish?

Marc Rieffell  
Syracuse, NY

**A** If the bowl is African blackwood, it's probably not finished. African blackwood turns almost like brass, and it's so dense you can create a shiny surface just by polishing it. A gifted turner can even get a shiny surface off the bevel of a gouge.

If there is a finish, it's probably just oil or wax. Scrub the dirty surface with VM&P naphtha and 0000 steel wool. This will remove the dirt but may also remove the finish. In this case, wipe on some wax using a clean rag. The new finish will remove any chalky residue left from the naphtha.

Michael Dresdner  
Finishing expert  
and AW contributing editor  
Puyallup, WA

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**Genuine Cuban mahogany**, wild tamarind and other Caribbean Basin hardwoods are available in small quantities from Urban Forest Recycler, Box 195, Tavernier, FL 33070, (305) 664-2924.

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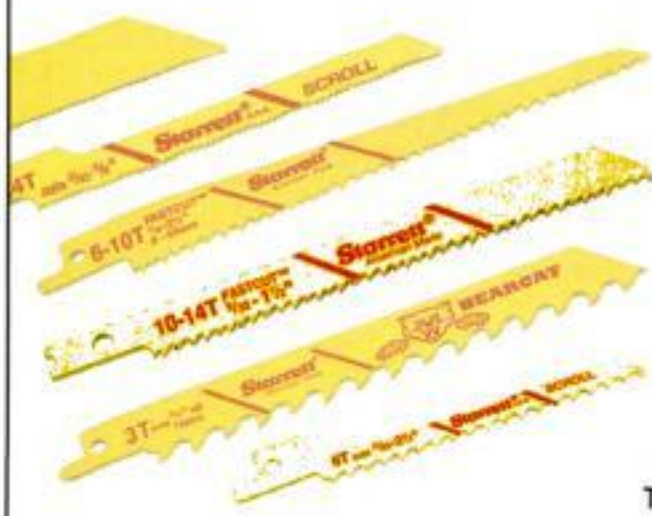


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# Best Saw....Best Buy

## The 66 TA Saw...An American Legend

"Most powerful saw we tested; built like a battleship, virtually vibration-free..."  
 "The Powermatic was unstoppable in our cutting test..."

"A peek under the hood reveals that Powermatic's trunnions, arbor and motor mount assembly are heavier than those on other saws..."

"Powermatic gets our Editors' Choice award as best cabinet saw of the bunch."

American Woodworker, Dec. 1995



### REGARDING ARBOR ASSEMBLIES...

"All in all, the Powermatic impressed us more than the other saws in this area. One reason it has almost no runout is its thick, accurately machined inner and outer blade flanges. And, the Powermatic is the only machine with a 3/4" diameter arbor shaft (milled to 5/8" at the threaded end to accept blades with 5/8" bores). The other machines have 5/8" arbors supported by 5/8" bearings..."

"The biggest, baddest, best-made machine in this test."

WOOD®, Aug. 1997



The above quotes from two of the most respected woodworking magazines in the country clearly demonstrate the superiority of the Powermatic 66 Table Saw when comparisons are made with any other table saw in its class. No mention was made of the left tilt saw blade that Powermatic developed and has used for over forty years, (and is only now being introduced by the other guys as one of their main features). Certainly, the left tilt saw blade makes cleaner cuts and is safer, but the experts who conduct comparative saw tests realize that performance comes from the *inner* structure of a saw. This is where the 66 is way ahead of the pack because the basic requirement of any table saw is its ability to hold the blade accurately in position during the cutting operation.

In support of this, the 66 weighs an average 189 lbs. more than the competition. Most of that poundage can be found in the Powermatic trunnion. This one-piece, heavy cast iron body delivers rock-solid, vibration-free performance. And don't be fooled by the competition saying they use three belts to drive their machines and Powermatic uses only two—a fact we readily admit. Do you know why we only use two belts? Because the two 3VX belts we use are a much *higher* grade than the competitions, transmit more horsepower, and run much cooler which in turn is easier on the arbor and bearings. Team up the 66 with the all new ACCU-FENCE® by Powermatic, and you have the best saw system in America!

Enough said? Not by a long shot! Go to your local dealer and get all the facts on the 66 Table Saw, and while you're there, get in on the great savings, including a \$200.00 savings bond, offered by Powermatic.

# SAVE

# \$575.00\*

Go for  
the  
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Easy access door



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 28" x 36" Extension table  
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# offcuts

*Bits and pieces of woodworking news*

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High school woodworking teacher Terry Blevins had a big problem: The local school board was threatening to shut down his program. So Blevins took his case to the AW Online message boards. He asked readers: "Why teach woodworking?"

More than 240 people responded, giving Blevins the inspiration and ammunition he needed to save the shop. In fact, he increased class enrollment by 30%!

**Come on in!**

To join the vibrant woodworking community at AW Online and the World Wide Web, call (800) 764-4400. You'll get free AOL software and 50 free hours of introductory online time.



PHOTO COURTESY OF TOOL CRIB OF THE NORTH

**Lending a hand.** When spring floods paralyzed Tool Crib's hometown, the well-known retailer jumped in to help.

## Tool Crib Fights the Flood

**W**hen the town of Grand Forks, ND, was submerged in recordbreaking floodwaters this spring, well-known mail-order retailer Tool Crib of the North jumped in to help.

"Tool Crib actually got its start here in Grand Forks as a motor repair business, back in 1948. So when the flood

struck, it was natural for us to help maintain and repair the motors and pumps used to fight it," says company spokeswoman Kerry Colman.

This isn't the first time Tool Crib has helped its hometown. Just before the flood, a blizzard caused widespread power outages in the area. The company

played a major role in supplying generators to local residents and businesses.

Tool Crib suffered no damage from the flood, but operations slowed for several weeks due to traffic shut-downs. Now it's back to business as usual, and everyone hopes the coming seasons will be easier.



## PHILADELPHIA FURNITURE SHOW WINNER

**Geoffrey Noden** was this year's proud recipient of the Best New Artist in Wood Media award, presented by AMERICAN WOODWORKER at the annual Philadelphia Furniture Show. Noden, a New Jersey craftsman, studied under famous English furniture maker John Makepeace. Today he trains his own apprentices, creating a wide range of furniture for a growing clientele. Noden's exhibit featured a number of custom-made chairs, including the arch-top model shown at left.

Congratulations to Geoff on this achievement!



**Design award winner.** Geoffrey Noden's walnut arch-top chair features bent lamination, steam-bent slats, and a carved and inlaid medallion. Above, publisher David Sloan presents Noden with his award.

CHAIR PHOTO BY MICHAEL SLACK, RIGHT PHOTO BY SUSANNAH HOGENDORN



# THE RIGHT

A D V A N T A G E



45° Bevel Left and **RIGHT**

**Dual Position Depth Adjusting Knob** for presetting crosscut and dado depth of cut

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**Large Cutting Capacity** cuts up to 3-5/8" x 12" at 90°



**64 Tooth Carbide Tipped Blade**

**Double Pole Sliding Mechanism** with linear ball bearings

**Pivoting Fence** for supporting taller stock



**Multi-Location Vise**

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**Centralized Control Handle** allows three functions with one hand

## 10" DUAL SLIDE COMPOUND MITER SAW

Model LS1013 delivers unsurpassed performance with the ability to compound cut both left and **RIGHT**. The double pole sliding head provides precision accuracy and a large cutting capacity to meet the needs of the professional user. The powerful motor with an electronic feedback system maintains constant speed under load for a superior finish while yielding low noise and vibration for operator comfort. The reviews are in...."the performance of Makita's LS1013 is a cut above the competition."

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**Model LS1013**

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CIRCLE NO. 53 ON PRODUCT INFORMATION FORM

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# offcuts

## Hands-On Hand Tools

**A**t the Steppingstone Museum near Havre de Grace, Maryland, you can do more than just look at old hand tools—you can use them. The museum offers a Weekend Apprenticeship program every summer, where eight volunteers learn traditional skills using many of the museum's 5,000-plus old tools.

Visitors are welcome, and group tours are available. For more information on apprenticeships or visits, contact the Steppingstone Museum, 461 Quaker Bottom Rd. (in Susquehanna State Park), Havre de Grace, MD 21078, (410) 939-2299.



**"Please touch" museum.** Steppingstone Museum shop master Wade Whitlock (right) cuts a board on a foot-powered tablesaw, while apprentices pump the treadle.

## A FITTING TRIBUTE

When woodworker and teacher Carolyn Grew-Sheridan succumbed to cancer last fall, her friend Gail Fredell, who directs the wood program at Colorado's Anderson Ranch school, decided to celebrate her indomitable spirit in wood. "I built 'Carolyn's table' as a portrait of her graciousness and the precariousness of life," says Fredell.

The late Grew-Sheridan co-ran the San Francisco furniture studio that has influenced a whole generation of West Coast woodworkers. Her husband, John, still runs the Grew-Sheridan Studio.

PHOTO COURTESY OF STEPPINGSTONE MUSEUM



SOURCES: APA-ENGINEERED WOOD ASSN., HARDWOOD PLYWOOD AND VENEER ASSN.

## PLENTIFUL PLYWOOD

In 1996 alone, U.S. plywood manufacturers produced over 20 billion sq. ft. of softwood and hardwood plywood. Stood on edge, all those 4x8 sheets would stretch 3,700 miles—from Miami to Juneau, Alaska.

## CMT FIRMS SETTLE TRADEMARK DISPUTE

As a result of a trademark settlement, CMT Tools, a Florida manufacturer and catalog supplier of router bits, saw blades and accessories, has changed its name to Jesada Tools. Jesada's U.S.-made router bits will have a white non-stick coating instead of the familiar orange coating previously used on bits sold by

the former CMT Tools. For more information on Jesada Tools, call (800) 531-5559.

CMT USA, of North Carolina, will continue to market orange-colored, Italian-made router bits and other cutting tools in the United States under the CMT USA brand. For more information on CMT USA, call (888) 268-2487.

## FURNITURE THAT FOOLS THE EYE

If Bugs Bunny built furniture, this would be it. Using traditional forms—chests, benches, bureaus, etc.—John Cederquist constructs fully functional furniture from hand-laminated veneers glued to a plywood substrate. He paints, carves, dyes, grooves and otherwise treats his veneers to achieve all kinds of optical illusions.

A traveling exhibit of Cederquist's work runs September 13 to November 30 at the Oakland Museum of California, 1000 Oak St., Oakland, CA 94607, (510) 238-2200. The exhibit visits the Smithsonian in the fall of 1999.



**Couchabunga!** This cartoonlike settee by John Cederquist is made from Baltic birch plywood, maple, epoxy and veneer. Yes, you can really sit on it.

PHOTO BY MICHAEL SASSO, COURTESY OF OAKLAND MUSEUM OF CALIFORNIA. ILLUSTRATION BY CHRISTOPHER RHODES



THE NEW RYOBI DETAIL BISCUIT JOINER

# THE DIFFERENCE BETWEEN WOODWORKING AND WOODNOTWORKING.

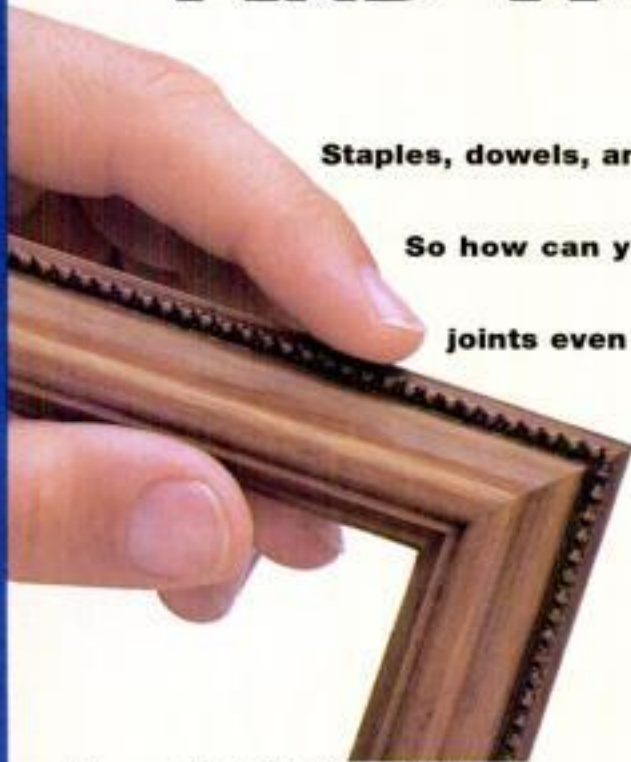
Staples, dowels, and glue won't do. Standard-size biscuits won't fit.

So how can you make neat, tight, professional joints even in small stock? With Ryobi's new

Detail Biscuit Joiner, that's how.



Standard biscuits stick out of small joints, and the mis-match shows, even after you trim the excess.



The new Ryobi Detail Biscuit Joiner uses miniature "Accu-biscuits" for neat, tight, professional joints.



This compact powerhouse cuts smaller slots and uses miniature

"Accu-biscuits™" to fit where standard biscuits don't. And its price

is as small as its biscuits. But the Detail Biscuit Joiner is big

on performance, from its beefy motor to its die-cast

base and see-through fence. So see the

new Ryobi Detail Biscuit Joiner at your

local home center. It'll get

your wood working like

never before.



Ryobi "Accu-biscuits"  
(actual size).



The Ryobi Detail Biscuit Joiner does everything that a bigger tool does, and fits in small joints where a bigger tool won't.

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- 100 standard knives
- Custom knives
- Five-year warranty
- Fully American-made!



\* Elliptical jig required

EJ Elliptical jig allows  
radii as small as 7 in.



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CIRCLE NO. 90 ON PRODUCT INFORMATION FORM

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- Precision grinding on any length of HSS blade



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| United Kingdom: | BriMarc    | 01926 493389   |
| Australia:      | PROMAC     | 07-3279-4811   |
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CIRCLE NO. 161 ON PRODUCT INFORMATION FORM





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at rock bottom prices  
in the entire U.S.A.!



### DOUBLE FLUTED STRAIGHT BITS

Used for cutting dadoes, rabbets, circles and other general purpose routing. Can be used in solid wood, plywood, certain plastics and laminated material. Use shortest length (B) for work to be done. For use in hand-held routers only.



| 1/4" SHANK |                  |                  |            |            |
|------------|------------------|------------------|------------|------------|
| MODEL      | CUTTER DIA.<br>A | CUT. LENGTH<br>B | REG. PRICE | SALE PRICE |
| C1001      | 1/4"             | 3/4"             | 5.95       | 4.95       |
| C1002      | 5/16"            | 3/4"             | 5.95       | 4.95       |
| C1003      | 3/8"             | 3/4"             | 5.95       | 4.95       |
| C1004      | 1/2"             | 3/4"             | 7.95       | 6.95       |
| C1005      | 5/8"             | 3/4"             | 9.95       | 8.95       |
| C1006      | 3/4"             | 3/4"             | 9.95       | 8.95       |
| C1007      | 1"               | 3/4"             | 11.95      | 10.95      |
| C1037      | 23/32"           | 3/4"             | 11.95      | 10.95      |

| 1/2" SHANK |           |           |       |       |
|------------|-----------|-----------|-------|-------|
| MODEL      | DIA.<br>A | LGTH<br>B | REG.  | SALE  |
| C1008      | 1/4"      | 3/4"      | 5.95  | 4.95  |
| C1009      | 5/16"     | 3/4"      | 5.95  | 4.95  |
| C1010      | 3/8"      | 3/4"      | 5.95  | 4.95  |
| C1059      | 7/16"     | 1"        | 7.95  | 6.95  |
| C1011      | 1/2"      | 1-3/16"   | 7.95  | 6.95  |
| C1012      | 1/2"      | 2"        | 14.95 | 13.95 |
| C1013      | 5/8"      | 1-1/8"    | 9.95  | 8.95  |
| C1014      | 5/8"      | 2-3/8"    | 14.95 | 13.95 |
| C1060      | 11/16"    | 1-1/8"    | 9.95  | 8.95  |
| C1038      | 23/32"    | 1-1/8"    | 11.95 | 10.95 |
| C1015      | 3/4"      | 1-1/8"    | 11.95 | 10.95 |
| C1016      | 3/4"      | 1-7/8"    | 14.95 | 13.95 |
| C1017      | 1"        | 1-1/8"    | 11.95 | 10.95 |
| C1061      | 1-3/16"   | 2"        | 21.95 | 20.95 |
| C1018      | 1-1/4"    | 1-3/16"   | 11.95 | 10.95 |
| C1019      | 1-3/8"    | 1-3/16"   | 14.95 | 13.95 |
| C1021      | 1-5/8"    | 1-3/16"   | 17.95 | 16.95 |



### ROUND OVER BITS with Guide Bearing

Roundover bits are used to make quarter rounds of various radii. Also used to soften edges, especially if making anything a child would use. Everyone needs a drawer full of these. So many uses we can't list them all.



| 1/4" SHANK |                  |                  |             |            |            |
|------------|------------------|------------------|-------------|------------|------------|
| MODEL      | CUTTER DIA.<br>A | CUT. LENGTH<br>B | RADIUS<br>R | REG. PRICE | SALE PRICE |
| C1174      | 5/8"             | 3/8"             | 1/16"       | 9.95       | 8.95       |
| C1175      | 7/8"             | 3/8"             | 1/8"        | 9.95       | 8.95       |
| C1176      | 7/8"             | 3/8"             | 3/16"       | 9.95       | 8.95       |
| C1177      | 1"               | 1/2"             | 1/4"        | 10.95      | 9.95       |
| C1178      | 1-1/8"           | 1/2"             | 5/16"       | 11.95      | 10.95      |
| C1179      | 1-1/4"           | 5/8"             | 3/8"        | 13.95      | 12.95      |
| C1180      | 1-1/2"           | 5/8"             | 1/2"        | 14.95      | 13.95      |

| 1/2" SHANK |                  |                  |             |            |            |
|------------|------------------|------------------|-------------|------------|------------|
| MODEL      | CUTTER DIA.<br>A | CUT. LENGTH<br>B | RADIUS<br>R | REG. PRICE | SALE PRICE |
| C1182      | 3/4"             | 3/8"             | 1/8"        | 9.95       | 8.95       |
| C1183      | 7/8"             | 3/8"             | 3/16"       | 9.95       | 8.95       |
| C1184      | 1"               | 1/2"             | 1/4"        | 10.95      | 9.95       |
| C1185      | 1-1/8"           | 1/2"             | 5/16"       | 11.95      | 10.95      |
| C1186      | 1-1/4"           | 5/8"             | 3/8"        | 13.95      | 12.95      |
| C1187      | 1-1/2"           | 3/4"             | 1/2"        | 14.95      | 13.95      |
| C1188      | 1-3/4"           | 7/8"             | 5/8"        | 17.95      | 16.95      |
| C1189      | 2"               | 1"               | 3/4"        | 18.95      | 17.95      |
| C1190      | 2-1/4"           | 1-1/8"           | 7/8"        | 29.95      | 28.95      |
| C1191      | 2-1/2"           | 1-1/4"           | 1"          | 29.95      | 28.95      |
| C1192      | 3"               | 1-1/2"           | 1-1/4"      | 34.95      | 33.95      |



### CORNER LOCK MITER BIT

Used for making 90° corner joints in wood for 3/8" to 1" material. Instructions for use provided.



| MODEL | SHANK | CUTTER DIA.<br>A | CUT. LENGTH<br>B | REG. PRICE | SALE PRICE |
|-------|-------|------------------|------------------|------------|------------|
| C1331 | 1/2"  | 3"               | 1"               | 44.95      | 39.95      |



### GLUE JOINT BITS

This bit is ideal for laminating and jointing stock together for use in table tops, panels and where extra-wide stock is needed. For 3/4" to 1" material.



| MODEL | SHANK | CUTTER DIA.<br>A | CUT. LENGTH<br>B | REG. PRICE | SALE PRICE |
|-------|-------|------------------|------------------|------------|------------|
| C1328 | 1/4"  | 1"               | 1-1/4"           | 29.95      | 27.95      |
| C1329 | 1/2"  | 1-1/8"           | 1-1/4"           | 29.95      | 27.95      |

### 3-PC. PLYWOOD STRAIGHT BIT SET



Make your dadoes fit better with these straight bits sized for modern plywood. Each set includes: 7/32", 1/32" and 2/32" and wooden box.

**LOW PRICE!**

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**ONLY \$19.95**

1/2" SHANK MODEL C1703

**ONLY \$19.95**



### REVERSIBLE STILE & RAIL - ROMAN OGEE with Guide Bearing

| MODEL | SHANK | CUTTER DIA.<br>A | CUTTER LGTH<br>B | REG. PRICE | SALE  |
|-------|-------|------------------|------------------|------------|-------|
| C1392 | 1/2"  | 1-5/8"           | 13/16"           | 49.95      | 47.95 |



### REVERSIBLE STILE & RAIL - OGEE with Guide Bearing

| MODEL | SHANK | CUTTER DIA.<br>A | CUTTER LGTH<br>B | REG. PRICE | SALE  |
|-------|-------|------------------|------------------|------------|-------|
| C1652 | 1/2"  | 1-5/8"           | 13/16"           | 49.95      | 47.95 |



### REVERSIBLE STILE & RAIL - BEVELED with Guide Bearing

| MODEL | SHANK | CUTTER DIA.<br>A | CUTTER LGTH<br>B | REG. PRICE | SALE  |
|-------|-------|------------------|------------------|------------|-------|
| C1653 | 1/2"  | 1-5/8"           | 13/16"           | 49.95      | 47.95 |



### REVERSIBLE STILE & RAIL - CLASSICAL with Guide Bearing

| MODEL | SHANK | CUTTER DIA.<br>A | CUTTER LGTH<br>B | REG. PRICE | SALE  |
|-------|-------|------------------|------------------|------------|-------|
| C1654 | 1/2"  | 1-5/8"           | 13/16"           | 49.95      | 47.95 |

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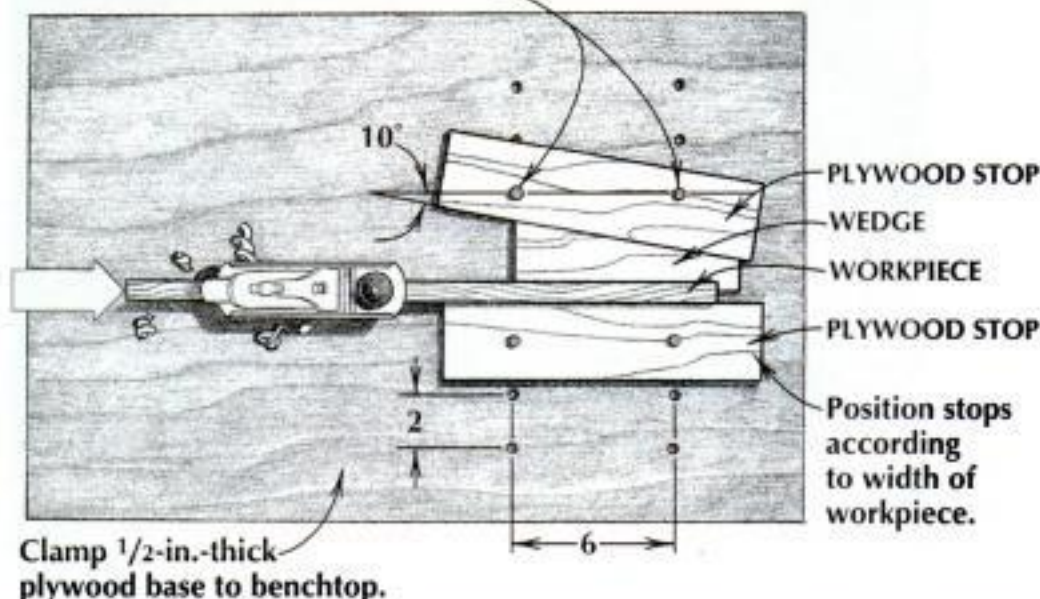
# Hand-Planing Jig for Thin Stock

*Best tip of the issue*

I devised this jig to hold narrow or thin parts when planing or sanding. I made the two stops movable so they can be spaced according to the width of the work. A tapered, L-shaped plywood wedge holds the work. The harder you push, the tighter the stock is gripped. I find it convenient to have several wedges of different sizes.

Hugh Montgomery  
Seattle, WA

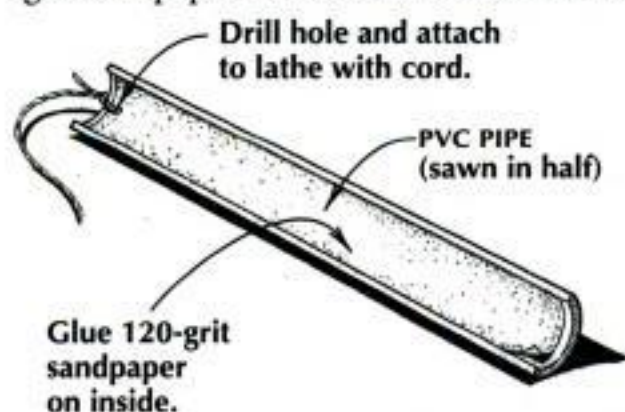
Glue  $\frac{3}{8}$ -in.-dia. dowels on 6-in. centers to match holes in base.



**Best tip wins \$200.** Know a better way of doing something? Designed a clever jig? Send your original woodworking tips, along with a sketch or a snapshot to: "Tech Tips," AMERICAN WOODWORKER, 33 E. Minor St., Emmaus, PA 18098. We'll pay \$50 for each tip we publish and \$200 for the best tip of the issue.

## Cheapskate's Gouge Slip

I devised this sharpening tool to keep the edge on my roughing gouges while lathe turning. I first ripped a 12-in. length of  $\frac{1}{4}$ -in.-dia. PVC pipe on the bandsaw. Then I glued a piece of 120-grit sandpaper to the inside surface with



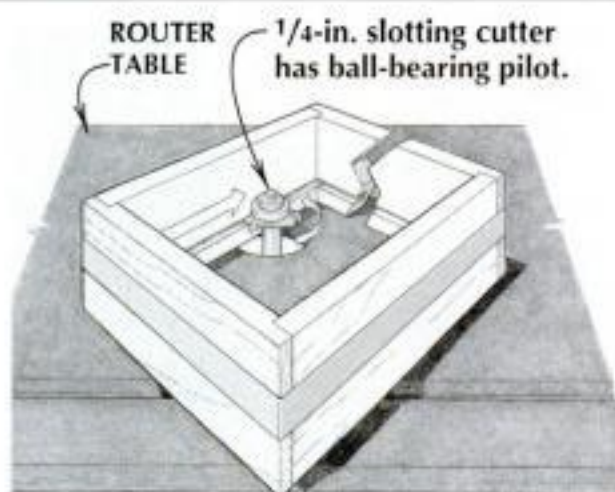
spray adhesive, trimming the edges with a utility knife.

Periodically running the gouge up the length of the slip at a  $30^\circ$  angle keeps the edge both sharp and symmetrical.

Dale Watkins  
Cincinnati, OH

## Routing Grooves

A quick way to cut grooves for plywood drawer bottoms is to rout them on the router table with a slotting cutter fitted with a ball-bearing pilot. I first assemble the drawer without glue, holding it together with tape or a band clamp if necessary. Then I make trial cuts in scrap and adjust the height of the cutter above the table. I can vary the depth of cut by installing a different pilot.

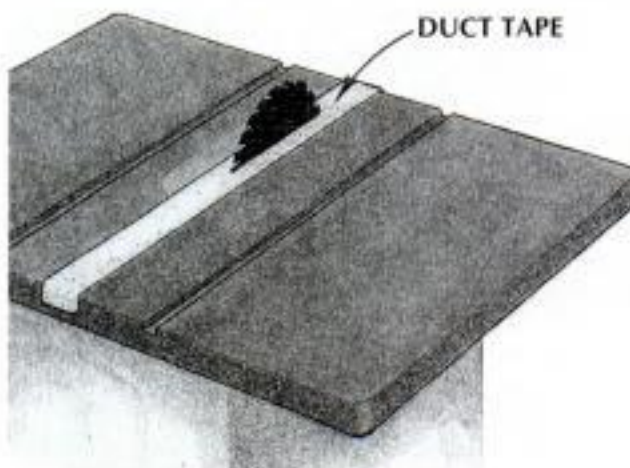


Rout the groove on all four sides, moving the assembly against the direction of rotation of the cutter. Cut the drawer bottom to fit between the grooves and radius all four corners.

Ed Sepkowski  
Rochester, NY

## Instant Throat Plate

When I was cutting some small parts on my tablesaw, they had an annoying habit of disappearing down the table insert. My solution was to lower the blade and then



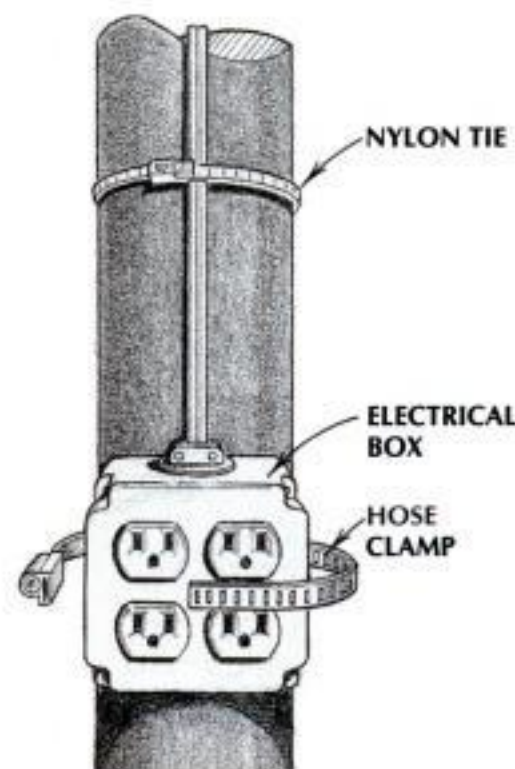
lay a long strip of duct tape right over the opening. Make sure it overlaps the front edge of the saw table as shown.

Ken Bruns  
Cleveland Heights, OH

## Securing Outlet Boxes

I wanted to fasten electrical outlets to the Lally columns in my basement workshop—without drilling any holes in them. My solution was to attach each box to the column with a stainless steel hose clamp. Nylon "zip" ties hold the electrical cord in place. The boxes are very snug, yet can easily be moved if necessary.

John Becker  
Berwyn, PA





**\$50 REBATE**

Deluxe Edition 14" Band Saw with enclosed stand, free mobile base, 18" Rip Fence and Cool Blocks™  
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Delta Sanding Center® Belt/Disc Sander.  
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## Shop-Made Keyless Chuck

I found I could convert my regular chuck to a keyless one by simply wrapping the chuck sleeve with masking

Wrap chuck with masking or duct tape.



tape. This increases the diameter—and hence the torque—so you can change bits with hand pressure alone. Use the drill in the forward position to install bits and reverse it to remove them.

Steve Lavallo  
Lubec, ME

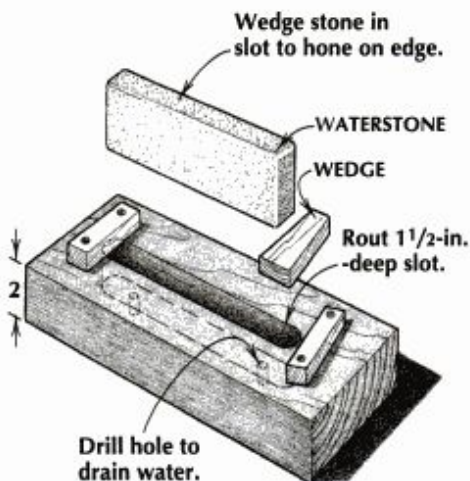
## Testing Hide Glue

To find out if your liquid hide glue is still good, dab a bit on your thumb and press your thumb and forefinger together. Wait a couple of minutes, then separate them. If the glue stretches into fine strands between your two fingers, the glue is still good.

Frank Klausz  
Pluckenin, NJ

## Waterstone Holder

I came up with this simple jig so I could use the edge of my waterstone to hone narrow tools such as chisels. This saves wearing grooves in the broad surface and frequent dressing of the stone.

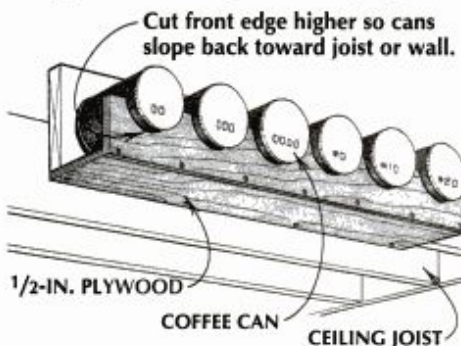


I used a 2-in.-thick block of wood and routed a slot as shown. The wedge keeps the stone firmly in place whether it's on edge or flat.

Tim Snyder  
Nazareth, PA

## Overhead Storage

I made this overhead rack out of coffee cans and scrap plywood to store various grades of steel wool. I mark the grade on the plastic lid and put a silica gel pouch

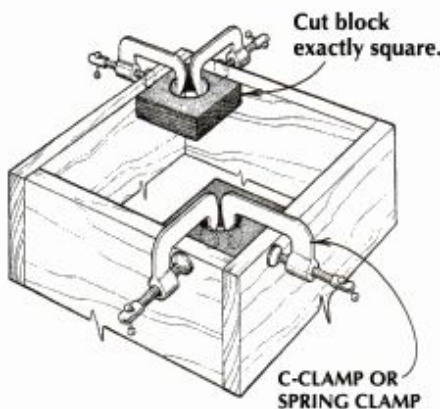


in each can to absorb moisture. I also find the cans handy for storing biscuits (the woodworking variety).

Harry Prout  
Troy, NY

## Squaring Blocks

A pair of these simple blocks guarantees square corners when gluing up a box or small drawer. Cut two 4-in.-square

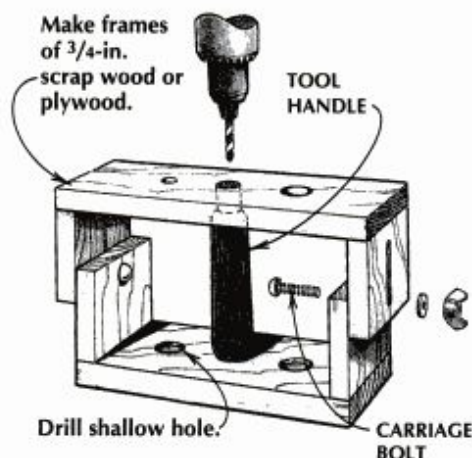


blocks with precise 90° corners, then drill a 2-in.-dia. hole in the middle of each square. Assemble the box and put a block in opposite corners. As you apply clamping pressure, each corner is pulled into square. For small projects, spring clips work equally well.

Norman Stewart  
Lacey, WA

## Drilling Tool Handles

This simple jig takes the guesswork out of drilling wood handles to accept the metal tang of a tool. I place the ferrule of the



handle in the appropriate hole, lower the top frame, then bore the hole on the drill press. I find the jig especially useful when tapered tangs require the hole to be drilled in stages with different-sized bits.

J.B. McCarter  
Tasmania, Australia

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Edwin Borgeson  
Portland, OR





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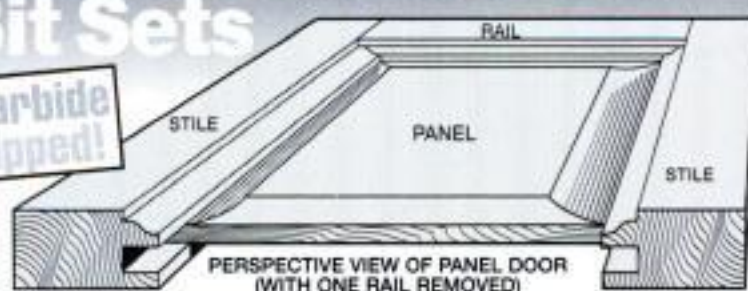
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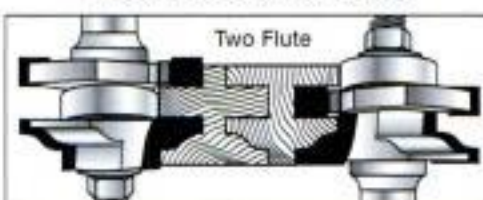


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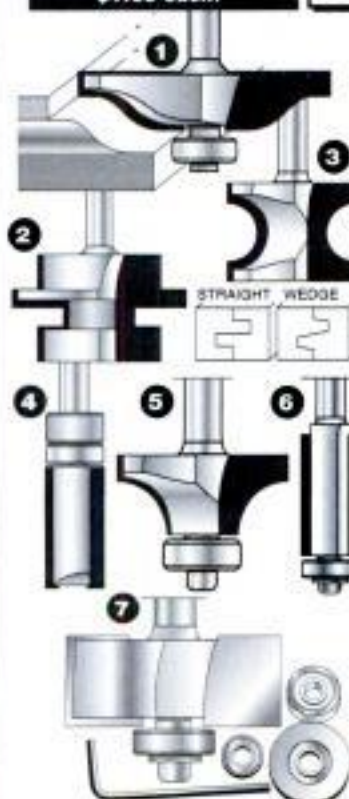
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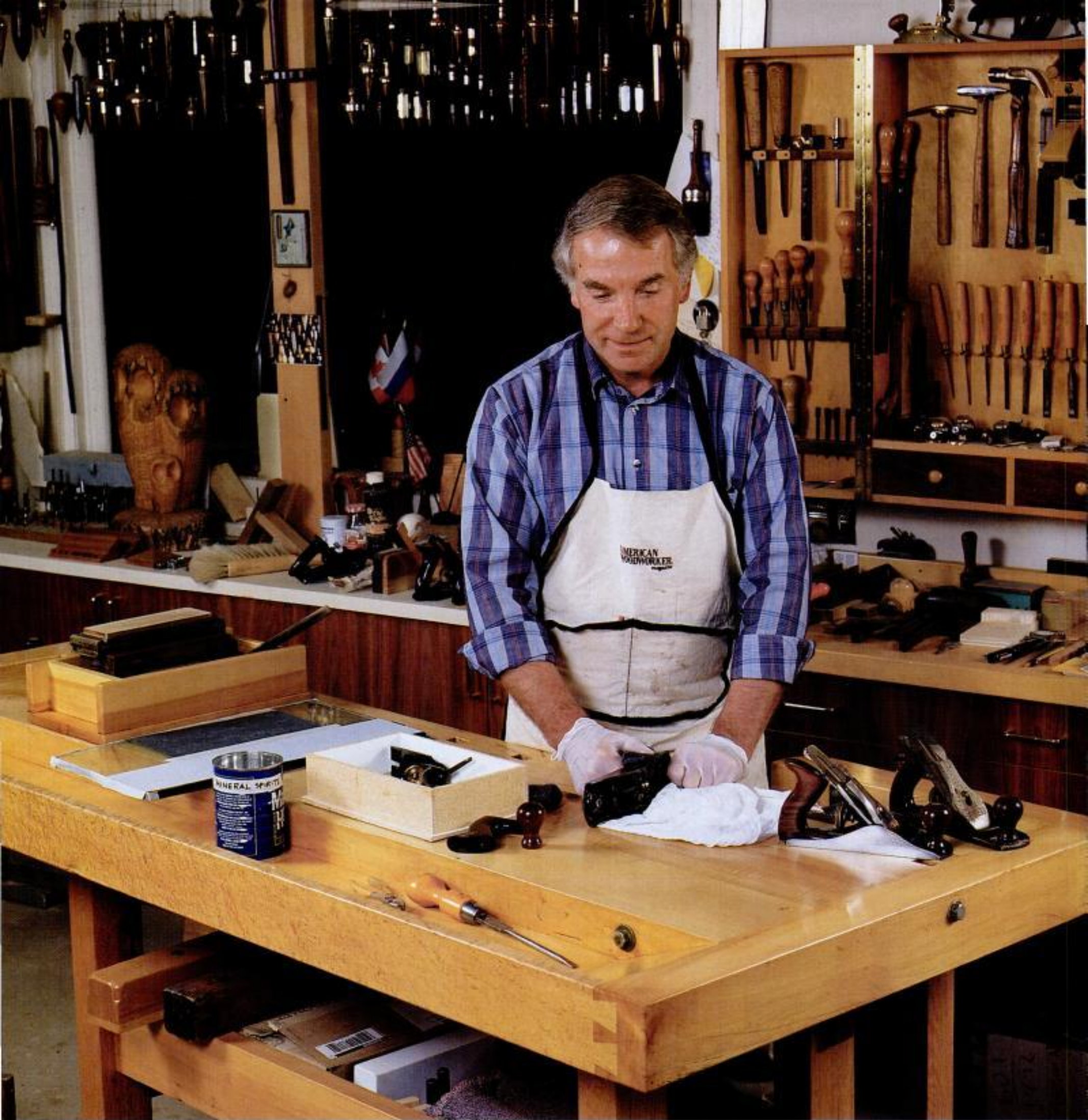


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# Tuning a Bench Plane

*How to get top-notch performance from a flea-market bargain*

by Frank Klausz

**Bathe and scrub.**  
The first step in restoring an old plane is to clean off the gunk. Here, the author soaks parts in mineral spirits, then scrubs away rust and grime with 00 steel wool.

PHOTOS BY ANDY RAE



You can't beat the sensation of planing a silky-smooth shaving. With each *sshhiikk* across the wood, you make a connection with the generations of woodworkers before you.

Of all the hand planes I use, I probably reach for a Stanley No. 4 most frequently. This metal-bodied smoothing plane is what I use to flush up joints or shave drawer sides until the fit is right. And for that final surface on a board, a properly tuned and sharpened No. 4 will leave a flat, glassy surface that sanding can't match.

But my No. 4 didn't come ready for action. Like all metal-bodied planes, it needed tuning before I could use it. In this article, I'll show you how to refurbish an old plane to better-than-new condition. Most of the techniques I'll discuss can also be applied to a brand-new plane.

A word about old planes: Some vintage planes are collector's items, and restoration can sometimes diminish their value. To find the value of your plane, check with an antique tool-collector's organization, such as the Mid-West Tool Collectors Association, Rt. 2, Box 152, Wartrace, TN 37183. Visit your local library for other organizations.

### What You Can and Can't Fix

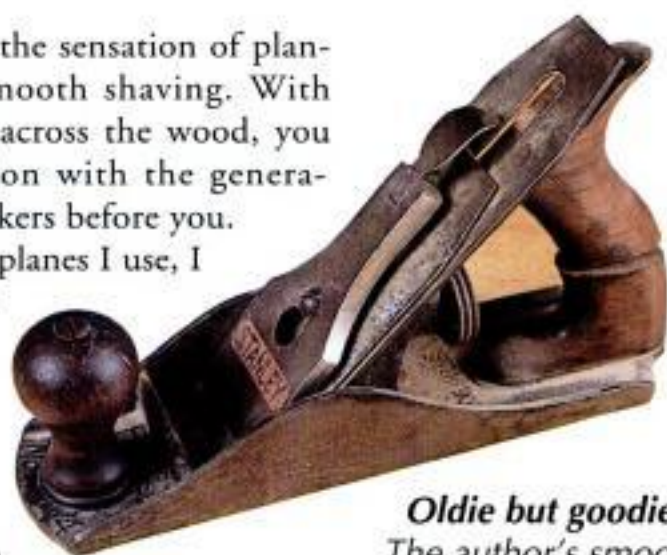
If you decide to tune a metal-bodied plane, first assess its condition. Many problems can be corrected with a tune-up; some can't.

First, remove the lever cap and use a screwdriver to remove the plane iron, or blade, from the chip breaker. (See drawing.) Then wipe away any grime with a rag and inspect the plane closely.

**You can usually fix** the following problems with a tune-up, or they won't affect the plane's performance.

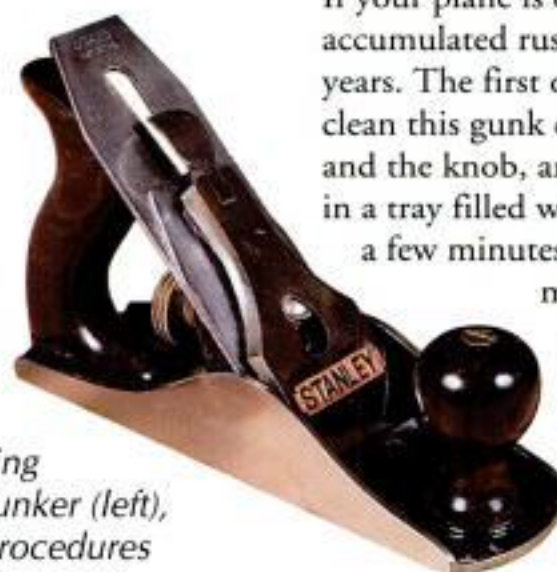
- **Small nicks or bumps in the sole.**
- **Broken handles.**
- **Rust pitting on the face (bevel) of the blade.**
- **Frozen bolts and nuts.**
- **Missing parts.** You can replace bolts, screws—even assemblies such as the frog—by looking for parts at flea markets and auctions, or you can buy them by mail. (See Sources.)

**You won't be able to fix** the following problems. Consider getting a new plane or blade.



### Oldie but goodie.

The author's smoothing plane looked like a junker (left), but proper tune-up procedures restored it to better-than-new condition (right).



### Cleaning and Repairing

If your plane is old, chances are it has accumulated rust and grime over the years. The first order of business is to clean this gunk off. Remove the handle and the knob, and soak the entire plane in a tray filled with mineral spirits. After a few minutes, disassemble all the

metal parts and use 00 steel wool to scrub away the loosened dirt. (See lead photo.)

Next, dry everything with a clean rag, and then oil all the moving parts—screws, nuts and levers—with a drop of light machine oil.

**You can glue broken handles or knobs** back together if the break is clean. I use a shop-made clamping jig for a strong joint. (See top photo, next page.) Splintered handles are more difficult to repair; consider buying a "junker" plane and scavenging the handle, or else buy a replacement handle. (See Sources.)

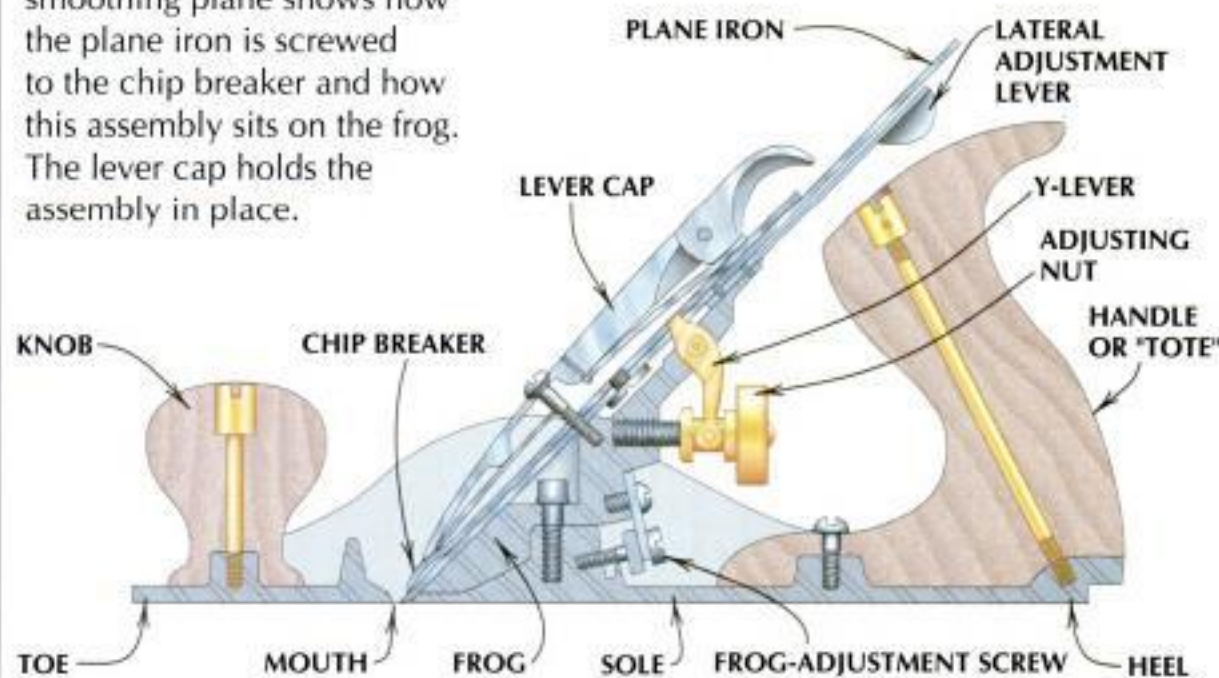
### Flattening the Sole

A flat sole is crucial for a plane to operate effectively. Small bumps will prevent the cutting edge of the blade from making full contact with the workpiece, and an overall hump or hollow in the sole can make it impossible to plane flat surfaces properly.

If your plane is new, there's a good chance the sole isn't flat. Older planes often have flat soles, but it's still a good idea to check the condition. (See sidebar, page 41.)

## PLANE ANATOMY

A cutaway view of a Bailey-style smoothing plane shows how the plane iron is screwed to the chip breaker and how this assembly sits on the frog. The lever cap holds the assembly in place.







**Handle cure.** Klausz glues a broken handle back together by clamping it in a simple homemade jig.

### Tuning the Chip Breaker

A properly set chip breaker forces shavings up and out of the plane. The leading edge of the chip breaker must be in full contact with the back of the plane iron, or it will jam with shavings.

Check the fit of the chip breaker by holding it against the back of the blade. If you see light between the leading edge of the chip breaker and the blade, you'll need to file the back of the chip breaker.

The back of the chip breaker is beveled slightly so the leading edge makes full contact with the blade. (See drawing.) Maintaining the bevel is a simple matter of holding a mill file at 90° to the edge of the breaker. The tip of the file should touch the surface of the breaker about 2 in. from the edge, so you automatically file at the correct angle. (See photo, below.)

Take a few short, even strokes with the file. Then finish up by filing the bevel parallel to the edge. Check the fit to the blade. If there are any gaps, repeat the procedure until you can't see any light.

The top of the chip breaker should be smooth to encourage shavings to pass easily over its surface. I remove any bumps or nicks on a buffing wheel charged with rouge. If the leading edge of the lever cap is rough, buff this as well.

### Sharpening

For any plane to work properly, the plane iron must be sharp. How sharp is sharp? If you can slice a piece of paper in two, or if you can score the top of your fingernail with light pressure, it's sharp. Here's how I sharpen a plane iron.

First, inspect the cutting edge of the blade. If there are any nicks or gouges, you'll need to dress the bevel on a grinding wheel. You can follow the existing bevel angle on the blade, or grind a new one. The exact angle of the bevel depends on the type of wood you're planing and on personal preference, but an angle of about 25° works for most planing.

I aim for a dead-square edge across the blade as I grind. Subsequent honing by hand will round this edge very slightly to

a curve. This slight curve prevents the corners of the blade from digging into the work and leaving telltale ridges. If you plan on taking heavy shavings, grind off the corners very slightly by holding the blade at 45° to the grindstone.

After grinding, I hone the bevel and the back of the blade on two flat waterstones. The first stone, at 1,000 grit, quickly smooths any grind marks and establishes the cutting edge. The second stone, at 6,000 grit, polishes the bevel.

It's important to keep the bevel flat and uniform while honing. You can use a honing guide to keep a consistent honing angle. I guide the blade by hand. Either method takes practice. But once you get the hang of it, honing is fast and easy.

### Adjusting the Frog

The plane iron must sit evenly on the frog to prevent chatter while planing. Check that the frog is seated firmly in the plane's body, and remove any bumps or rough spots on its surface with a file.

On most metal-bodied planes, a frog-adjustment screw allows you to increase or decrease the opening at the mouth of the plane for different shaving thicknesses. (See drawing.) Two screws in slotted holes anchor the frog to the body of the plane. You need to loosen these screws slightly, then turn the adjusting screw to move the frog forward or backward in the body of the plane.

For general-purpose planing, I adjust the frog position so that it's even with the back edge of the plane's mouth. For fine cuts, I advance the frog so the blade almost closes the gap in the mouth. Check the position of the frog by placing the plane iron in the plane and then looking at the mouth.

### SOURCES

If you can't find what you're looking for at flea markets or yard sales, try these antique tool dealers:

**Bill Hermanek**

31 Wildwood Lane  
Smithtown, NY 11787 *Circle #612*

**Bob Kaune Antique and Used Tools**

511 W. 11th St.  
Port Angeles, WA 98362 *Circle #613*

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**Flat and beveled.** Use a mill file to flatten the angled back of the chip breaker. A piece of masking tape on the tip of the file prevents scratches.



### Setting Up for a Cut

Once you've adjusted the frog, it's time to install the blade. Screw the chip breaker to the back of the blade. Never use the lever cap to do this, because it might nick the edge. Instead, use a screwdriver.

The edge of the chip breaker should be about  $\frac{1}{32}$  in. to  $\frac{1}{16}$  in. back from the cutting edge. The exact position depends on the type of planing you'll be doing. Closer to the edge, you get finer cuts with less tearout; but you'll need to push the plane with more force.

Backing off the chip breaker allows for an easier cut and a thicker shaving, but it increases the likelihood of tearout. You can start with the chip breaker set back  $\frac{1}{16}$  in., then adjust the setting closer to the cutting edge for the few final passes.

Place the blade and chip breaker bevel-side down on the frog, and secure the assembly with the lever cap. Then adjust for the depth of cut by turning the adjusting nut. Once you've set the depth, take up any slack in the Y-lever by turning the adjusting nut clockwise until it contacts the lever.

Sight along the bottom of the plane to check that the cutting edge is square to the sole. If one edge of the blade projects more, make the necessary adjustment by moving the lateral adjustment lever. Take a test cut. Your plane is correctly set when you can make a full-width shaving that feathers out slightly along the edges.

### From Beast to Beauty

Now that your plane is in good working order, there's one last step you should consider. I think a hand plane deserves some special touches, such as finishing the handle and knob and buffing the metal to a lustrous shine. These things may not affect performance, but any prized hand tool is worth it.

I give the knob and handle a couple of coats of lacquer. Then I buff the sides, chip breaker, lever cap and brass screws on a buffing wheel charged with rouge.

That's it. A little light oil or wax on the sole will help your new friend glide more easily over those surfaces just waiting to be polished. ▲



**FRANK KLAUSZ**  
is a master craftsman  
and an AW  
contributing editor.

## FLATTENING THE SOLE

**F**or a plane to work effectively, the sole should be flat. The good news is that the entire sole doesn't need to be flat—only a few key areas: around the mouth, along the edges, and at the heel and toe. Marking those areas directly on the sole with a felt marker can help you check your progress as you flatten. (See photo, right.)

Woodworkers have different methods when it comes to flattening the sole, but the basic concept is the same: You work the plane back and forth on a flat, abrasive surface until the high spots are leveled and the key areas are flat. Keeping an even, downward pressure as you rub prevents you from rounding over any areas.

My flattening method is to utilize a sheet of plate glass, which unlike window glass, is dependably flat. I glue two grits of sandpaper to the glass—150 grit and 400 grit—with spray adhesive, and I use a light machine oil as a lubricant. (See photo, below.)

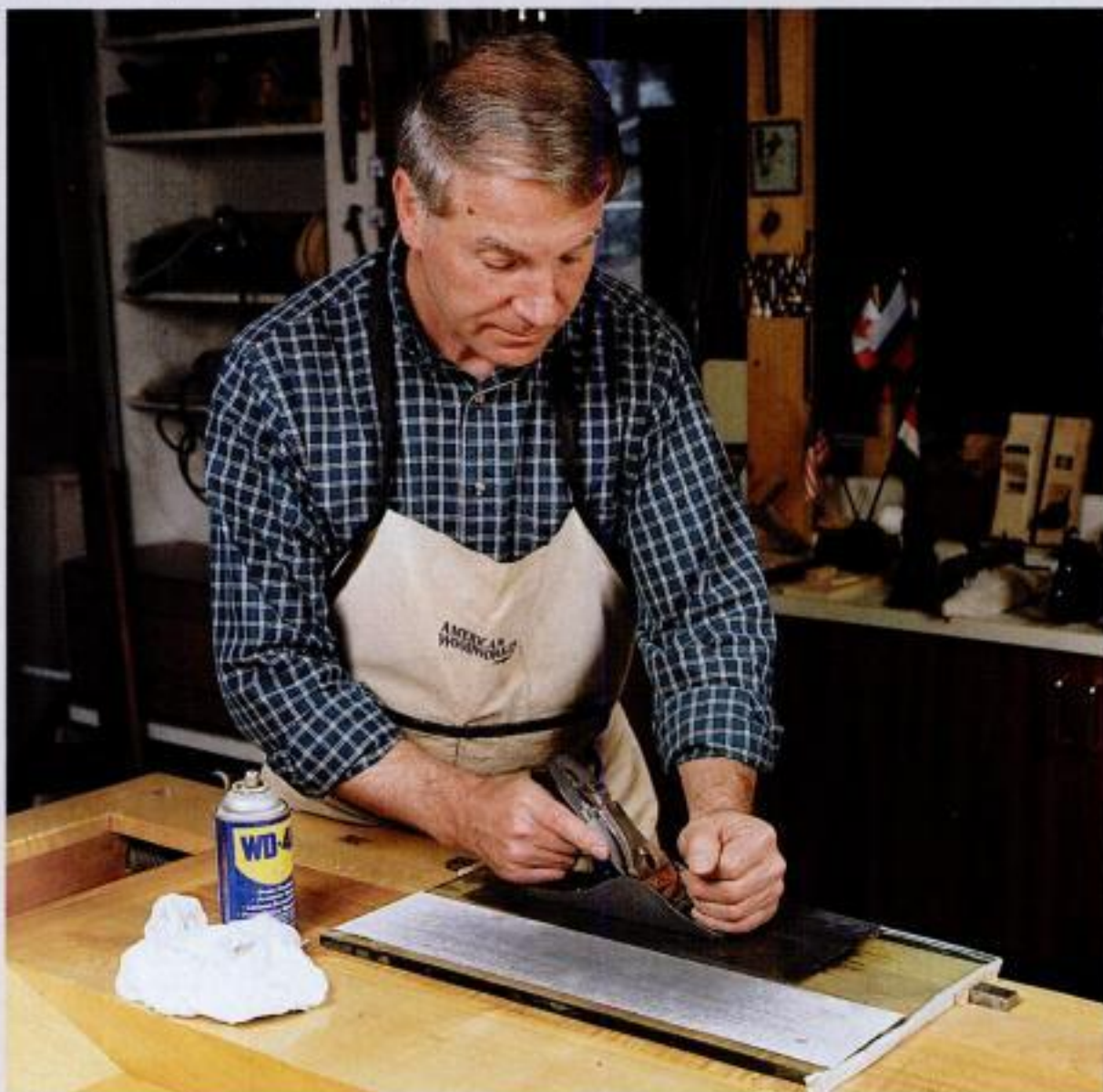
Flattening might take an hour, or it may take just a few minutes, depending on the condition of the sole. A couple passes on the 400-grit paper will wear off some or all of your marks and show you where the sole still needs work. Continue rubbing on the 400-grit paper until the key areas are flat. If the sole needs a lot of work, start with the 150-grit sandpaper, and finish up with the 400-grit.

—F.K.



### Key points of contact.

The black marker lines show the areas on the sole that need to be flat.



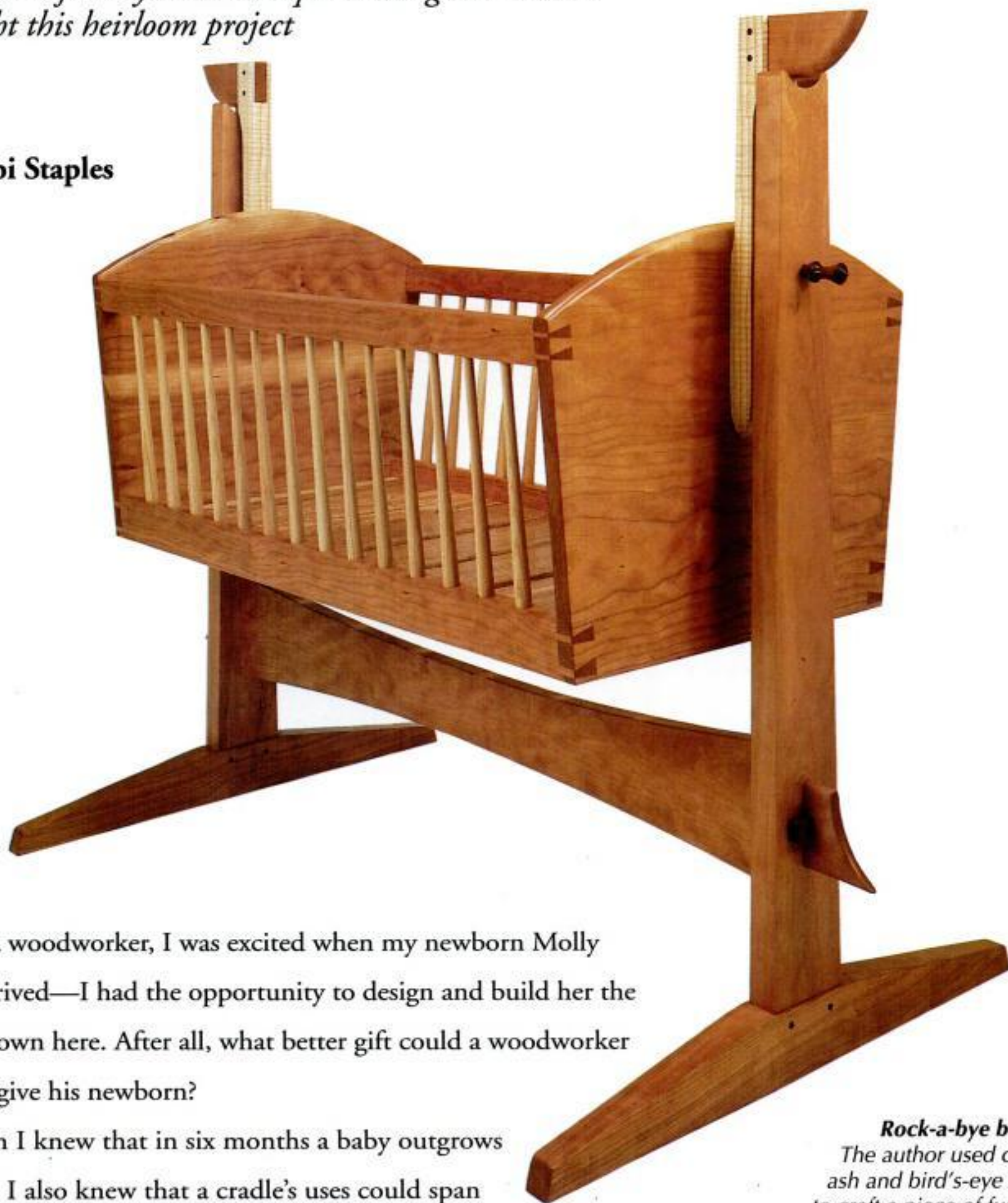
**Flat glass and even pressure.** 150-grit and 400-grit sandpaper glued to a sheet of plate glass makes the perfect flattening plate for truing the sole.



# molly's cradle

*Traditional joinery and a unique rocking mechanism highlight this heirloom project*

by Robbi Staples



**a**s a woodworker, I was excited when my newborn Molly arrived—I had the opportunity to design and build her the cradle shown here. After all, what better gift could a woodworker and dad give his newborn?

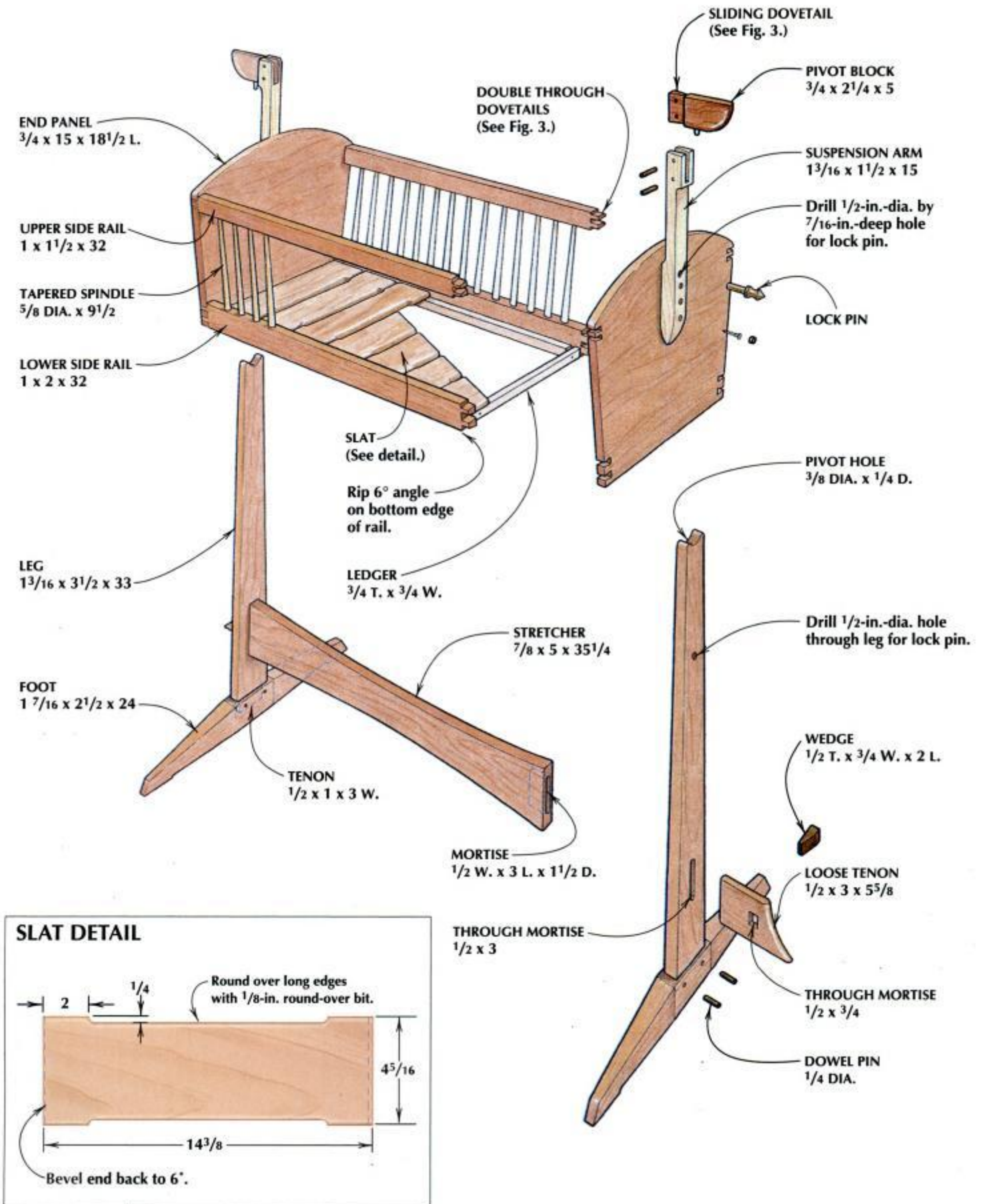
Though I knew that in six months a baby outgrows a cradle, I also knew that a cradle's uses could span generations. First, what was once your infant's sleepy habitat can hold toys, dolls—you name it. Later, visiting grandchildren will appreciate a comfortable bed. And eventually your child can pass the cradle down to his or her own children.

**Rock-a-bye beauty.**  
The author used cherry, ash and bird's-eye maple to craft a piece of furniture that's bound to be enjoyed by many generations.



## FIG. 1: HANGING CRADLE

This cradle consists of a basket designed to swing or lock safely on a stand that can be disassembled easily. Major dimensions are shown in Fig. 2. Suspension system details are shown in Fig. 3.

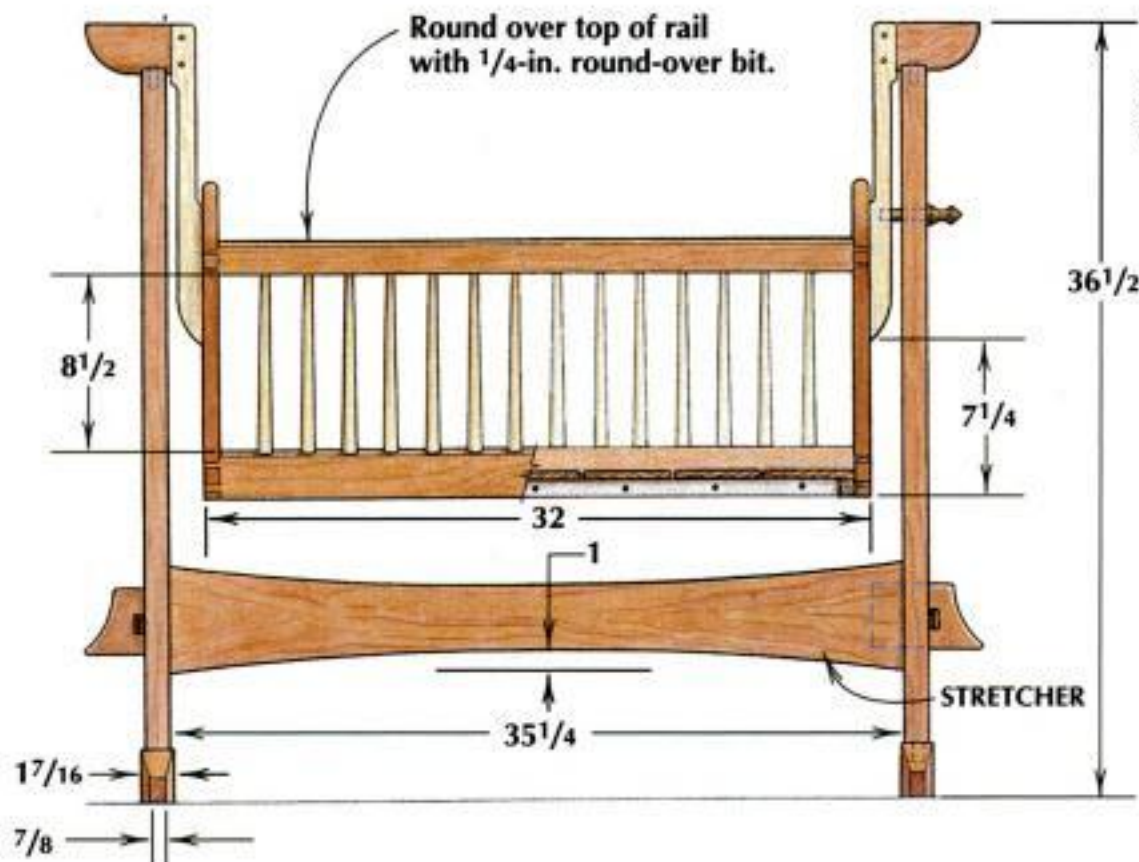




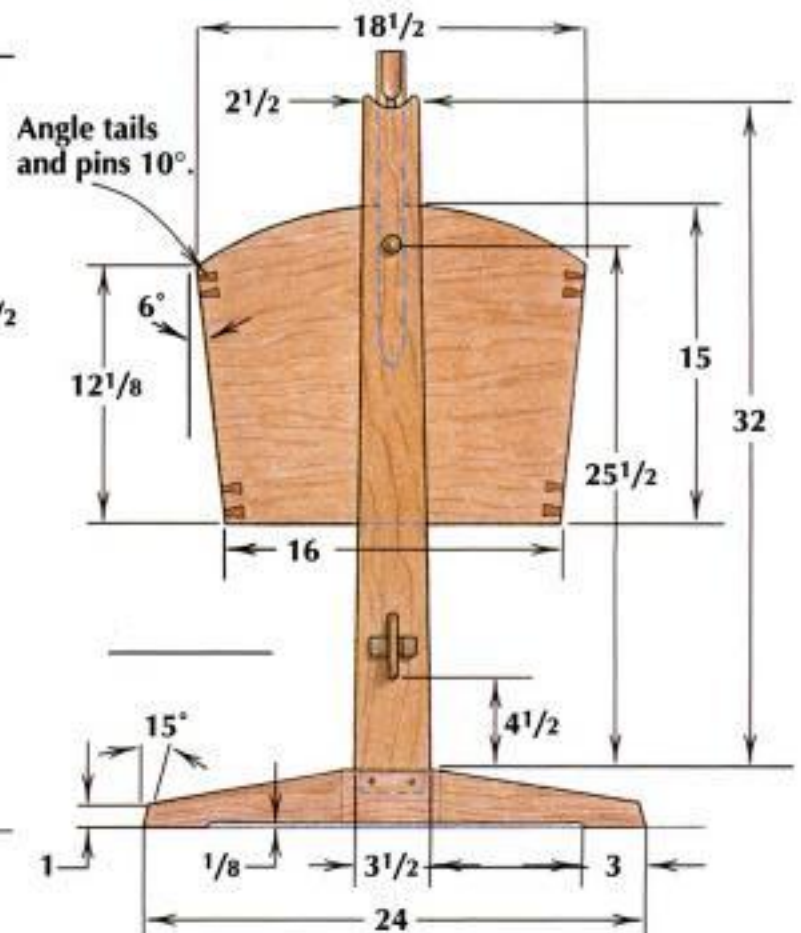
## FIG. 2: ELEVATIONS

Make the basket, suspension arm and leg assemblies first, then use these to determine the exact shoulder-to-shoulder dimension of the stretcher.

### SIDE



### END



### Cradle Design

At six months, babies are usually 23 in. to 27 in. long. To keep the cradle on an intimate scale, I designed it to hold the smallest standard baby mattress I could find, which measures 14 in. by 30 in.

I chose open sides with spindles instead of an enclosed basket for several reasons. Spindles allow the baby to see out, and parents to see in. It's also more comfortable during hot weather. And the spindle design makes the cradle as light and portable as possible.

I designed the basket to rest on a knock-down stand. Dowel pins attached to the basket register in holes at the top of the stand, allowing the basket to be rocked gently or lifted off at a moment's notice. (See Fig. 1, previous page.) It's easy to make the cradle stationary: Just push a lock pin through the stand and into a hole drilled in the suspension arm at one end of the basket.

### Safety Considerations

When designing the cradle, I wanted to make sure it would be safe for our baby. The Consumer Products Safety Commission stipulates that cradles and cribs should have spindles or slats spaced

no more than  $2\frac{3}{8}$  in. apart. Corner posts shouldn't extend more than  $\frac{1}{16}$  in. above rails, and all exposed edges should be smooth. These safety aspects ensure that active babies won't get themselves or a piece of clothing caught. Also, there should be no loose parts (screws or bolts) for babies to get their hands on.

The design I settled on incorporates traditional mortise-and-tenon and dovetail joinery. I used cherry for the main parts—the basket and stand; ash for the spindles and the suspension arm; and bird's-eye maple for the slats. Feel free to use any hardwood or combination of hardwoods that suits your tastes.

### Making the Basket

It's important to make the basket first, since any variation in its finished length can be compensated for when making the stand.

**Dovetailing the side rails.** I lay out the dovetail pins on the ends of the rails, using a 1:6 ratio, or about  $10^\circ$ , for the slope of the pins. (See Fig. 2.) I make the pins about  $\frac{1}{32}$  in. longer than necessary so they protrude slightly through the ends of the cradle when

they're assembled. This saves time later when sanding or planing the pins flush to the tails. When laying out the pins on the lower rails, make sure you allow room for a  $6^\circ$  rip cut, which you'll make later. (See Fig. 1.)

I cut the pins on the tablesaw, using a 5-in.-high fence screwed to my miter gauge to support the stock vertically on the saw table. I adjust the miter gauge to  $10^\circ$  and mark a series of vertical lines on the fence as a guide to help me keep the workpiece square to the table. Later in the process, I use the same technique to saw the socket in the suspension arms. (See right photo, page 48.) If you prefer, you can cut the pins by hand with a fine-tooth handsaw.

**Spindle work.** Once the pins are cut in the rails, I lay out the centers for the spindle holes. (See Fig. 3.) I drill all the holes on the drill press, clamping a fence to the table as shown in the top left photo on the opposite page. An alignment mark on the fence ensures accurate spacing of holes. Drill all the  $\frac{5}{8}$ -in.-dia. holes in the lower rails. Then with the same fence setup, switch to a  $\frac{3}{8}$ -in.-dia. bit and drill the holes in the upper rails.



## MAKING THE SIDES



**Fenced for a straight line of holes.** Clamp a fence to the drill-press table when drilling the multiple holes for the spindles, lining up marks on the work with a mark on the fence.

Next, I turn the spindles on the lathe, tapering each spindle from  $\frac{5}{8}$  in. to  $\frac{3}{8}$  in. with a small gouge. Once the spindles are turned, I bandsaw a  $\frac{1}{8}$ -in.-deep "X" in each spindle end to eliminate glue squeeze-out when clamping up. If you don't have access to a lathe, you can buy  $\frac{5}{8}$ -in. dowel stock and make the taper with a block plane or spokeshave.

**Gluing up the side assemblies.** Gluing the spindles to the rails can be troublesome if you're not careful to keep the assembly flat and square. I made a simple glue-up jig to deal with this. (See top right photo, above.) The jig consists of a flat piece of plywood with two fences screwed to it to form a 90° angle. By placing the jig on a flat surface such as a bench or a tablesaw, you avoid introducing any twist in the assembly. Since I also use this jig later when gluing the rails to the end panels, I cut  $\frac{1}{8}$ -in.-deep notches spaced 14 in. apart in the shorter fence where the pins protrude.

With 14 spindles to glue into 14 holes in each side assembly, it's wise to use a glue with a long open time. Polyurethane glue is the perfect choice. Since it is moisture activated, I use a small sponge to dampen all the spindle holes prior to spreading any glue. An eye-shadow applicator, available wherever cosmetics are sold, works great. Be careful not to apply too much, since polyurethane glue expands as it cures.

After the glue has dried, I rip a 6° angle on the bottom rail to match the



**Glue up square and without twist.** Clamp each side assembly against two 90° fences to keep it square. Use a flat surface such as the table-saw to ensure the panel glues up flat.



**Bevel the lower rail.** After the glue has dried, rip a 6° bevel on the lower rail on the tablesaw to match the splay on the ends of the cradle.

angle on the cradle ends. (See lower right photo, above.) Then I round over the top edges of the upper rails with a  $\frac{1}{4}$ -in. round-over bit. (See photo, below.) Stop the round-over  $\frac{1}{2}$  in. from the rails' shoulders so you don't accidentally rout into the dovetail pins. You'll round these stopped areas later by hand.

### Making the End Panels

The tops of the end panels have a gentle arc that reflects the design of more traditional cradles. I prepare my blanks slightly oversize and lay out the 6° slope on the ends of the panels. Then I lay out the arcs directly on the wood by tracing along a  $\frac{1}{8}$ -in.-thick wooden strip bent to the desired curve. Two small blocks, held with hot glue, hold the ends of the strip while I bend the center with my free hand. (See top left photo, page 47.)

Once I've drawn the arc, I cut the angled ends with a crosscut jig on the tablesaw. (See *Shop Solutions*, AW #60.) Alternatively, you can rough out the angle on the bandsaw and sand to your

line with a disc sander. After the ends are angled, bandsaw the top arc and round it over slightly with a spokeshave, working from the center toward the ends. (See Fig. 2.)

**Marking and cutting the tails.** I use a sharp #3 pencil to trace around the dovetail pins when marking out the tails, as shown in the top middle photo,

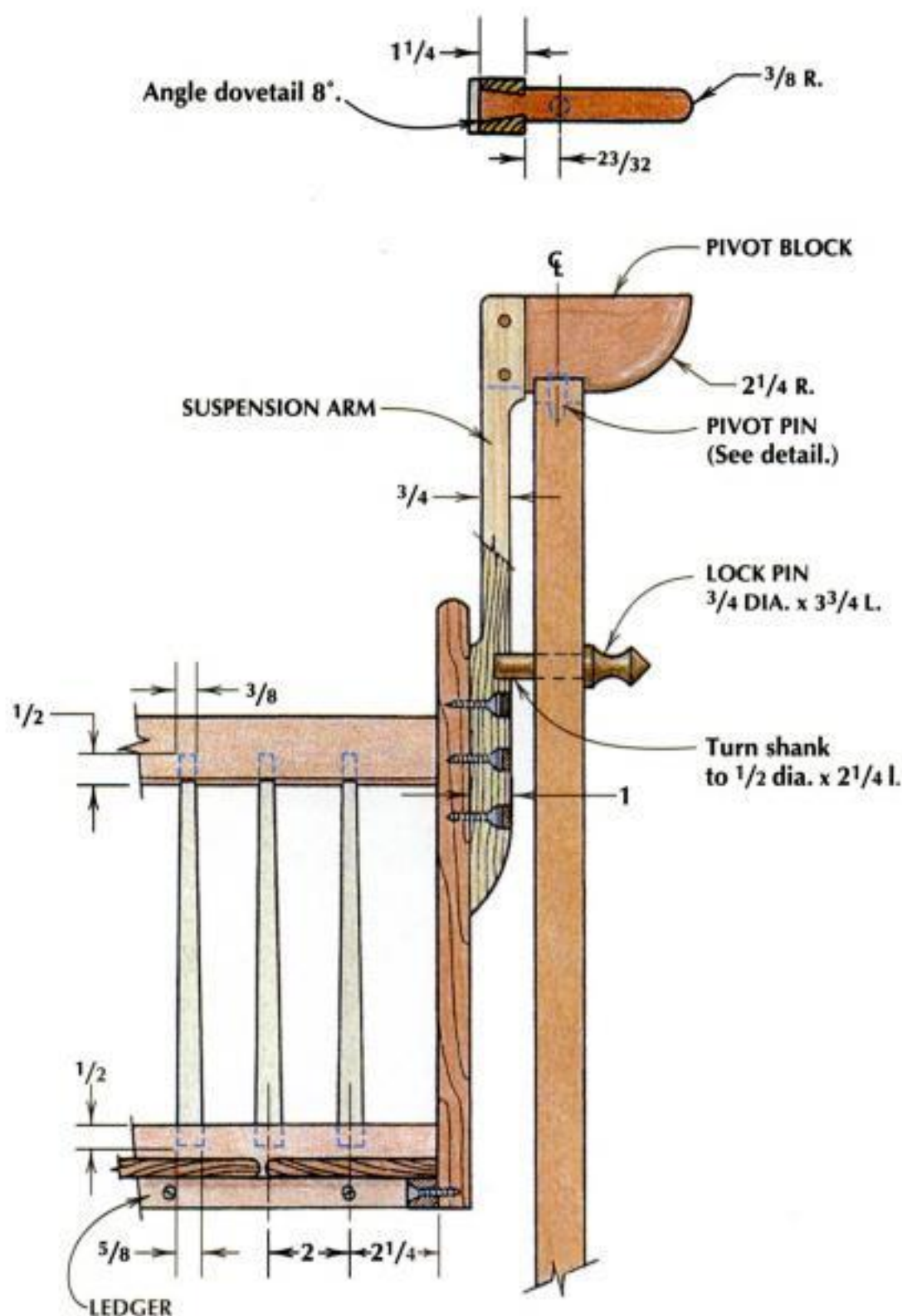


**Round over the upper rail.** Rout a stopped round-over on the top of the upper rail with a piloted  $\frac{1}{4}$ -in. round-over bit.



## FIG. 3: SUSPENSION SYSTEM ELEVATION

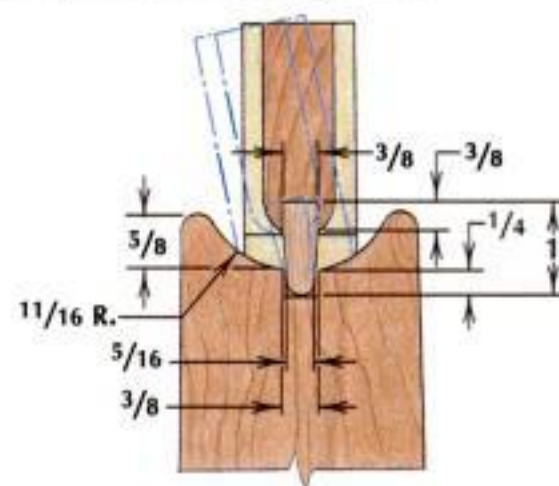
The cradle rocks by pivoting on two wooden dowel pins. Each pin is glued to a pivot block and rests in a hole drilled in the top of the legs.



**Balancing act.** Wooden dowel pins in the suspension assemblies pivot in shallow holes in the stand.

### PIVOT PIN DETAIL

Taper dowel from 3/8 in. to 5/16 in. on the drill press with a sanding drum.



opposite page. If you're new to sawing dovetails by hand, it's a good idea to mark the waste. I cut the tails with a Japanese *dozuki* saw, removing the waste with sharp chisels and a mallet. (See top right photo, opposite page.) Check the fit to the side assemblies and make any necessary adjustments with a chisel.

Now you can glue up the basket. I use the same glue-up jig as before to ensure that the basket goes together square. (See bottom photo, opposite page.) Once the glue has dried, finish rounding the tops of the side rails with a rasp.

### Attaching the Bottom Slats

The seven bottom slats, made of bird's-eye maple, rest on ledger strips screwed to the insides of the basket. (See Fig. 3.) I cut the slats to the dimensions shown in the detail in Fig. 1, sawing out the scooped center sections on the bandsaw. Don't scoop the outside edges of the end slats. I rout the edges of the slats with a 1/8-in. round-over bit.

Next, I glue the slats to the ledgers, centering a 1 1/2-in.-long bead of glue on each slat end. I also spread glue on the sides of the two end slats and on the end

panels. I butt the two end slats against the end panels. Then I position the remaining slats by inserting playing cards between them, creating equal gaps to allow for wood movement. To clamp the slats to the ledgers, I lay a board over the tops of the slats and place a 50-lb. bag of sand on top of the board.

### Making the Suspension System

Now that the basket is made, you can turn your attention to the suspension system, which consists of two pivot



## MAKING THE END PANELS



**Simple arc.** Draw the curve on the panel with a thin, straight-grained strip of wood flexed between two wood blocks. Hot glue holds the blocks on the stock.



**Mark the tails.** Trace around the pins in the side assembly with a sharp pencil to lay out the tails on the end panel. Then square your lines across the ends of the panel.



**Saw to the mark.** Cut to the baseline of the tails with a dovetail saw, keeping the blade on the waste side of the marks. Clean out the waste with a sharp chisel.

blocks, each dovetailed into a suspension arm. (See Fig. 3.)

I cut the tails on the pivot blocks on the tablesaw. It's much safer to cut both tails in a single piece of stock, then cut the two individual blocks from that piece. I start by making 1/8-in.-deep shoulder cuts in both ends of the stock with a miter gauge, riding the end of the piece against the fence at the correct distance from the blade. Then I tilt the blade to 8° and use a tenoning jig to rip the cheeks. (See photo, next page.) After ripping the cheeks, cut a 1/4-in. shoulder on each tail with a fine-tooth handsaw.

Drill the 3/8-in.-dia. holes in the bottom of the block for the pivot pins with a brad-point bit. Then cut out the individual blocks on the bandsaw and round over the edges on the router table with a 3/8-in. round-over bit.

For the pivot pins, I use tapered wooden table-alignment pins (available from The Woodworkers' Store, 800-279-4441). You can make your own pins from 3/8-in.-dia. dowel stock if you prefer. Taper one end of each dowel to 5/16-in. dia. with a sanding drum or a stationary belt sander, then glue the 3/8-in.-dia. end into the pivot block. (See detail, Fig. 3.)

**Cutting the dovetail sockets in the suspension arms is next.** I cut the sockets on the tablesaw, using the same fence and miter-gauge setup I used

before. I adjust the miter gauge to 8° and raise the saw blade height to 2 in. (See left photo, next page.) If you're uncomfortable holding the workpiece with your hands alone, you can clamp the arm to the fence. Rip one side in each piece, then readjust the miter gauge to cut the opposite side. Clean out the waste by making successive passes over the blade with the miter gauge set at 90°. Then use a sharp chisel to remove any remaining waste, being careful to keep the shoulder flat. Once you've cut the joint, cut the arms to final shape on the bandsaw.

Now you can glue the dovetailed pivot block to the suspension arm. Once the glue has dried, finish-sand the assemblies and pin the joints with 1/4-in.-dia. walnut dowels. Then mount the arms to the end panels with three screws apiece, centering the arms on the panels and applying a 2-in.-long bead of glue at the center screw holes.

### Making the Stand

The cradle stand is composed of two leg-and-foot assemblies joined by a stretcher with wedged through tenons. (See Fig. 1.)



**Glue up the basket.** Use the same squaring jig as before to glue up the basket flat and square. Paired clamps pull the dovetails home.



## TABLESAW DOVETAILS



**Tails first.** The author angles the blade to 8° and clamps the pivot-block stock in a Delta tenoning jig to saw the sliding dovetails.



**Pins second.** With the miter gauge angled at 8°, Staples saws the dovetail socket in the suspension arm by holding the work against a high fence attached to the miter gauge.

The legs and feet are assembled with mortise-and-tenon joints, which I cut while the stock is still square. I use a plunge router to rout the mortises in the feet as well as the through mortises in the legs and the end mortises in the stretcher. I equip my router with a 1/2-in.-dia. upcut spiral bit and a commercial mortising guide that attaches to the baseplate of my router. (See lower photo, opposite page.) The guide consists of two fences that center the bit over the stock (available from Woodhaven, 800-344-6657; for more info see *Toolbox*, AW #44). To cut the tenons in the ends of the legs, I use the same tablesaw tenoning jig as before.

A doweling jig lets me accurately bore the 3/8-in.-dia. by 7/8-in.-deep hole for the pivot pin at the top of each leg. Then I bandsaw the radius at the top of each leg and taper the legs and feet. Clean up the tapers on the jointer and sand the radius cuts smooth. Be sure not to remove too much material when sawing and sanding the curves at the tops of the legs. Removing 5/8 in. of material in this area should give you a 1/4-in.-deep hole for the pivot pin. (See Fig. 3.)

Before gluing the legs to the feet, remove 1/8 in. of material from the center of the bottom of each foot to ensure

that the stand won't rock on an uneven floor. I use a commercial edge sander for this operation, but a hand-held belt sander will also work fine. Assemble the legs and the feet, and pin the joints with 1/4-in. walnut dowels. Finally, lay out and drill a 1/2-in.-dia. hole in one of the legs for the lock pin. (See Figs. 1 and 2.)

With the suspension arms glued to the basket, now is the time to calculate the length of the stretcher for the stand. To do this, measure from the centerline of the two pivot pins, then subtract half the thickness of each leg.

Making the wedged through-tenon joints is next. Since the protruding tenons are a visual part of the design, it's important that they fit accurately in the through mortises cut in the legs. Rather than try to cut perfect tenons on the ends of the stretcher, I make separate loose tenons that fit perfectly into mortises. (See sidebar, opposite page.)

With all the joinery complete, the next step is to assemble the stand and drill the 1/2-in.-dia. hole in the suspension arm for the lock pin. Make sure that the basket is centered on the stand, and temporarily clamp the two assemblies together. Drill through the lock pin hole and 7/16 in. deep into the suspension arm.

The last step is to turn the lock pin on the lathe. (See Fig. 3.) Alternatively, you can carve or whittle the pin from 3/4-in.-dia. dowel stock. Turn the shank of the pin so it slides easily but without slop through the hole in the leg.

### Finishing Up

Choosing a finish was important for me. I knew babies can make a mess, so I wanted a finish that could take the worst that ours could think up. Since I prefer the look of a hand-rubbed finish, I chose Sutherland Welles low-luster wiping varnish (available from Garrett Wade, 800-221-2942). Four coats wiped on, then wiped off with a clean rag, provide the protection of a varnish—and it's easy to maintain the finish by wiping on another coat when the wood starts to look dull. A rubdown with a soft cloth dampened with a mixture of beeswax and lemon oil completed Molly's dreamy abode. ▲



**ROBBI STAPLES**  
is a full-time woodworker and dad. He lives and works in southeastern Massachusetts.



# WEDGED THROUGH TENONS—THE EASY WAY

The wedged through tenon is a knock-down joint that goes way back in woodworking history. Strong, attractive and easy to put together or take apart, this joint can be used on all kinds of furniture, including tables, chests, armoires, cradles and even bookcases.

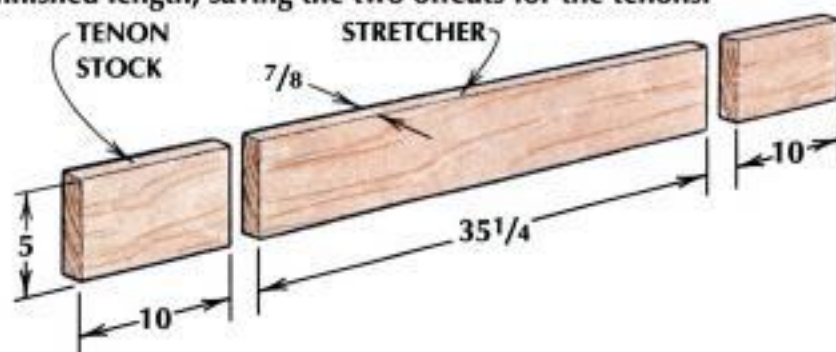
Cutting the wedge and its through mortise are the easy parts of this joinery exercise. The tough job is cutting the broad, long tenon accurately so that it will fit snugly in its mortise. But this isn't a problem if you follow my technique. Instead of forming the tenon from the stretcher, I cut a piece from each stretcher end and use it to make a loose tenon, as shown below. It's easy to plane the loose tenons to the exact thickness for their mortises. Then each tenon can be joined back to the stretcher. If you stick to the original grain orientation, no one will suspect that your tenons were made the easy way. —R.S.

## FIG. 4: MAKING A WEDGED THROUGH TENON

This beautiful knock-down joint is sturdy and simple to make by following the steps below:

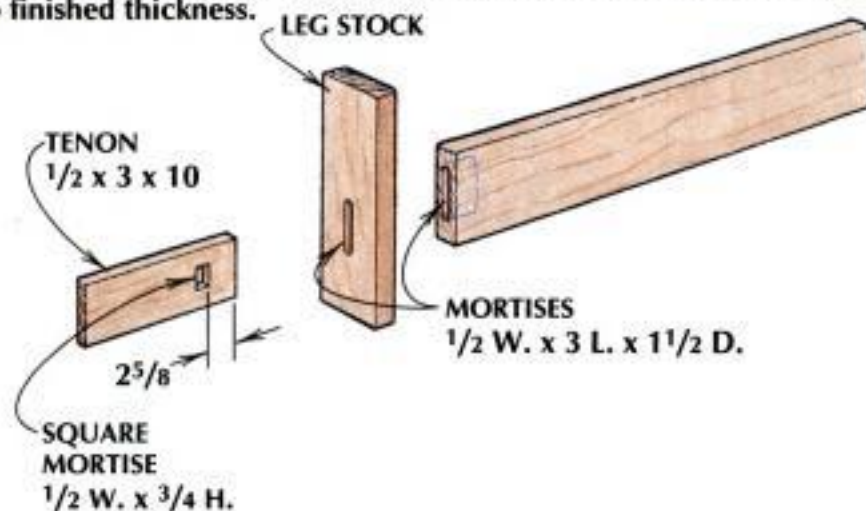
### STEP 1

**Crosscut stock.** Mill the stretcher stock to  $\frac{7}{8}$  in. x 5 in. x  $55\frac{1}{4}$  in. long. Crosscut the stretcher to finished length, saving the two offcuts for the tenons.



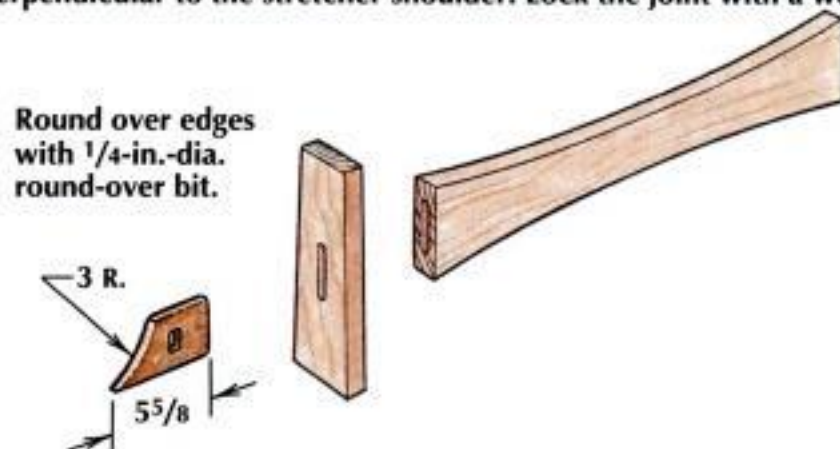
### STEP 2

**Route mortises; rip and plane tenons to fit.** Drill and chop the mortise in each tenon after planing it to finished thickness.



### STEP 3

**Bandsaw stretcher, leg and tenon.** Shape the parts on the bandsaw, and round over the tenon to fit the curved ends of the mortises. Glue the tenon into the stretcher, making sure the tenon is perpendicular to the stretcher shoulder. Lock the joint with a wedge.

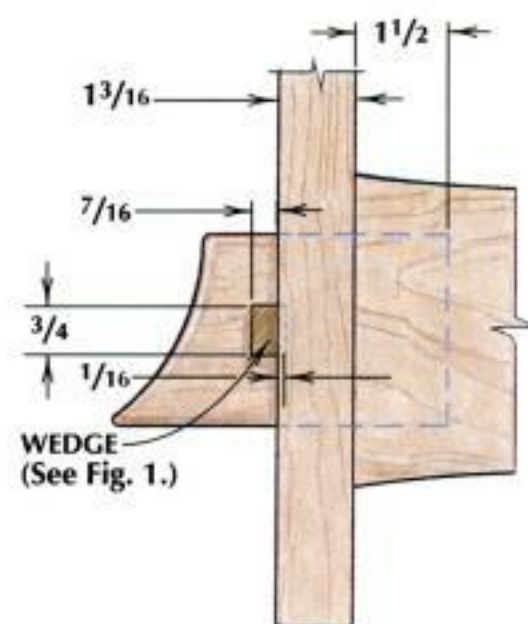


**Locked with a wedge.** This sturdy knock-down joint is held together with a wedge that slips through a mortise in the tenon.



**Plunge route the mortise.** Staples uses a  $\frac{1}{2}$ -in. upcut spiral bit and a pair of fences attached to the router baseplate to route the mortise in the end of the stretcher.

## ASSEMBLED JOINT DETAIL







**Slicing it thin.** With a sharp blade, a well-tuned saw and a curved fence, resawing can be easy and precise. Above, Duginske shows that the proof is in the cut, creating a slab of veneer less than  $\frac{1}{8}$  in. thick.

make your own veneer, resawing pieces as thin as  $\frac{1}{8}$  in. with great precision. (See photo, above.)

Resawing on the bandsaw doesn't require fancy equipment or jigs, but it is important to have a well-tuned bandsaw equipped with the right blade. (For information on tuning up your bandsaw, see AW #38.) In this article, I'll show how easy and precise resawing can be.

### Picking Your Blade

The blade to use for resawing is the widest one that your saw can handle. This means a  $\frac{1}{2}$ -in. blade for most bandsaws with wheels 14 in. in diameter or smaller. For resawing, I recommend a 3 tpi (tooth per inch) hook blade. Sharpness is crucial, so start with a new or freshly sharpened blade.

### Tensioning the Blade

Blade tension is frequently debated among bandsaw users. But one simple rule won't stir up controversy: As the blade grows dull, more tension is required to make accurate cuts. The trouble is, increased tension is a poor substitute for sharp teeth. If your saw is well-adjusted and you have a sharp blade, I'd set blade tension to  $\frac{3}{4}$  in. on the tensioning scale. If your saw doesn't have a tension scale, tension the blade so that finger pressure will cause it to deflect no more than  $\frac{1}{4}$  in. over 6 in. of length.

# Super-Accurate Resawing

**Use a curved fence to make straight cuts**

by Mark Duginske

**W**ith the ability to make straight or curved cuts in wood of all thicknesses, the bandsaw packs more creative potential than any other woodworking machine. In its repertoire of cutting capabilities, resawing is very important. Resawing enables you to transform thicker lumber into stock of proper dimension for a particular project. You can exploit the beauty of a single board or log by resawing it into flitches that can be bookmatched or used in other combinations. You can even



## Guiding Options

There's more than one way to guide the workpiece when you resaw. Some woodworkers like to guide the workpiece against a narrow or pointed edge that is positioned vertically on the table and perpendicular to the sawblade. The narrow line of contact makes it easy to compensate for a blade that "leads," or wanders off the cutting line when the stock is fed straight into it. You can get satisfactory results with the "single-point" method, but it demands very careful hand control, so it's not a good choice if you have any volume of work to do.

Another way to resaw is to guide the stock against a tall, flat rip fence. Fence height should be within about 2 in. of the height of the material to be cut. The straight-fence method provides you with a broad, solid reference surface, but you often end up fighting the way the blade wants to lead instead of compensating for it.

The resawing guide I prefer offers the benefits of both methods mentioned above. I like to guide the workpiece against a curved wood auxiliary fence positioned vertically, with the high point of the curve closest to the blade. (See top photo.) This approach offers the lead-adjustment flexibility of the single-point method with the advantage of easier control.

## Resawing the Easy Way

Here's how you can resaw precisely and easily using a curved fence as I do.

**First, test and adjust for blade lead.** Pencil a straight line down the edge of a square-edged board. Start sawing along your layout line, guiding the board free-hand. If the blade is leading, you'll have to feed the board into the blade at an angle to keep cutting along the line. Stop the cut in the middle of the board and mark the lead angle on the table with a pencil. Your fence should be installed parallel to this lead line. You can test the lead angle by cutting some scrap of the same species and dimensions as the piece you are planning to resaw.

**Now make a curved fence.** The curved fence I use is the same length as the bandsaw's standard rip fence and stands about 3 in. lower than the height of the material to be cut. It is designed to be roughly 1/4 in. thicker in the middle than on each end. You can curve your fence on the jointer, as I do, or plane the curve by hand.



**The curved fence makes it easy.** Use your right hand to keep the workpiece running against the broadest part of the fence. Feed and fine-tune the feed direction with your left hand, using the fence for leverage.

**Tapering the fence on the jointer.** Clamp a stop block on the infeed side of the jointer fence to plane a taper on each end.

To create the curved fence on the jointer, clamp a stop block on the infeed side of the jointer fence. Position the block less than half the length of the workpiece from the cutterhead, and adjust table height to take a light cut—no more than 1/16 in. Turn on the jointer and carefully lower the workpiece onto the bed, butting the back edge of the workpiece against the stop block. Then use a push block to move the workpiece through the cutter. (See photo, right.) Repeat this sequence to taper both ends of the piece equally. Use a hand plane to give your fence its final smooth shape.

Screw the curved fence to your bandsaw's rip fence, or if you don't have a rip fence, add a flat base and several right-angled braces so that you can clamp this assembly to the saw table. When positioning your fence, make sure the broadest part of the curve is directly opposite the blade.

**The curved fence is easy to use.** As you adjust the distance between the fence and the blade, make sure to keep the straight side of the fence parallel to the lead line you marked on the table earlier. Check to make sure the blade is square with the table surface.

Now you're ready to resaw. Feed the workpiece into the blade and control the feed direction with your left hand. Use your right hand to push the workpiece



fast against the broadest part of the curved fence. With this setup, you'll find it easy to fine-tune your feed direction during the cut—a crucial capability when resawing.

**Listen to your saw and watch the blade.** Sound and sight will tell you when feed pressure is excessive. The general rule to remember when resawing is: the slower the better. With a little practice, you'll soon be making the straight, smooth cuts that transform thick material into thinner stock with minimal waste. ▲



**MARK DUGINSKE'S** latest book, *Cutting Shapes and Profiles*, is available from Rodale Press (33 E. Minor St., Emmaus, PA 18098).



# V All about Varnish

Proper brush technique  
guarantees a flawless finish

by Michael Dresdner



**Beauty and durability.** Varnish finishes highlight the wood, while offering excellent resistance to staining and abrasion.

Varnish is a misunderstood term. Many people think of varnish as any clear topcoat. But for this article, we'll use the more literal definition: a brushable, oil-based clear coating that cures by polymerization. We'll leave out the common varnish pretenders: straight oils, water-based finishes, and "spirit" varnish, the old name for lacquer and shellac.

In this article, I'll tell you how to select the right varnish, prepare the wood surface, and use expert brushing techniques to create a flawless finish.

## Why Varnish?

Varnish is formed by cooking one or more oils with a resin, or by converting oils into a resin. Add in a solvent such as naphtha or mineral spirits, and you have the makings of a tough, durable, attractive finish. Varnish provides better scratch and stain resistance than wax, oil or Danish oil finishes, and better heat, solvent, and chipping resistance than shellac or lacquer. Varnish is the ideal choice for any furniture that is likely to get substantial wear: tables, countertops, kitchen cabinets, chairs, doors (interior and exterior), and even wood patio furniture.

To find out what type of varnish is best for the job you have in mind, see the sidebar on the opposite page. Despite differences in durability, clarity, resin formulation and other details, all types of varnish have several attributes in common. They all improve the appearance of wood by enhancing its *chatoyance*, or depth. All varnishes have excellent adhesion to wood. And all varnishes have about the same brushing characteristics.

## Getting Ready

Varnish requires only minimal wood preparation. Start by sanding or scraping the wood smooth. I like to sand most woods to 180 grit, but will go to 220 or 320 on very hard woods like ebony or rock maple, which show sanding scratches more easily. When you're done sanding, blow off the sawdust with compressed air. Alternatively, you can wipe the wood down with a tack rag—a clean cloth with just enough partially cured varnish on it to be tacky. You can purchase tack rags at paint stores.

**Now address your finish area.** Choose a clean room or apply the varnish at the end of the day when you can keep the wood dust to a minimum. Some woodworkers create a dust-free finishing and drying area by draping polyethylene film on a frame to make a room within the shop. While you don't want dust blowing around, you do want good ventilation, so allow for a healthy amount of clean air flow.

Temperature is not a major issue, since varnish will cure in rooms as cold as 50°F. However, severe cold or high humidity will slow the curing process significantly. This means more time for dust to settle on the surface. When possible, choose a dry, warm area to work in.

Remove any hardware and disassemble the furniture. To prevent runs and sags, it is best to coat surfaces horizontally. If you need to coat both sides of



# CHOOSING THE RIGHT VARNISH

**Types of varnish:** There are three traditional varnish categories: brushing varnish, spar varnish and urethane or polyurethane varnish. The “poly” varnishes are also divided into three subgroups, based primarily on intended use. The chart below provides the basic information you need to select the type of varnish for specific finishing jobs.

**Comments on clarity:** Not all varnishes cure to a clear surface finish. Clarity or tone can vary from brand to brand, depending on the oil used to make the varnish. Some polyurethanes are intentionally formulated to be almost colorless, but most varnish is a pleasant honey-amber hue. Spar varnish tends to be darker and redder than the others.

**Gloss, satin and matte:** All types of varnish are available in these three grades, which refer to the shine, or gloss, of the cured finish. “Satin” is between the high sheen of a gloss or “high-gloss” varnish and the less-reflective finish of matte. All sheens share the same durability and handling properties, but if you apply too many coats of matte or satin, the clarity of the finish may start to diminish.

| TYPE OF VARNISH             | ACTIVE INGREDIENTS                                           | RECOAT TIME (HRS) | DRYING TIME (HRS) | PROS                                                                            | CONS                                                      | BEST CHOICE FOR:                                                                                               |
|-----------------------------|--------------------------------------------------------------|-------------------|-------------------|---------------------------------------------------------------------------------|-----------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|
| Oil-alkyd brushing          | Linseed oil, alkyd resin                                     | 1 to 4            | 6 to 8            | Usually least expensive varnish; rubs out easily; rich appearance; good clarity | Less heat and scratch resistance than polyurethanes       | Tables, chairs, bookcases, banisters, all interior trim and furniture                                          |
| Spar                        | Tung oil, phenolic resin                                     | 6 to 8            | 24                | Most flexible varnish; natural UV resistance; best recoat adhesion              | Softer than other varnishes; reddish color; slower drying | Brightwork on boats (but not decking or below the waterline), patio furniture, exterior doors                  |
| Interior polyurethane       | Oil-derived resin                                            | 1 to 4            | 6 to 8            | Least expensive poly varnish; very durable; good scratch and heat resistance    | May not resist UV degradation                             | Counter and bartops, kitchen cabinets, tabletops, all high-wear interior surfaces, interior doors and woodwork |
| Exterior polyurethane       | Oil-derived resin, UV blockers, light stabilizers            | 6 to 8            | 12 to 16          | Very durable; protects wood from sunlight; resists UV degradation               | More expensive than interior mixtures                     | Interior and exterior doors, patio furniture, any high-wear furniture, inside or out                           |
| Polyurethane floor coatings | Oil-derived resin, plasticizers to improve flow and leveling | 8 to 12           | 24                | Tough; flexible; very durable; best leveling varnish on horizontal surfaces     | Prone to sagging when applied on vertical surfaces        | Wood floors, but not deck surfaces                                                                             |

a piece, such as a cabinet door, have a nail board ready or use nails and rails so you can flip the piece wet. (See photo, below.) When surfaces must be coated vertically, I turn them upside down if I can. That way any runs or sags that I’ve missed will be less visible if the light source is from above, as it usually is.

You’ll also need a clean can to mix in and finish from, and another for cleaning brushes. Varnish is not particularly harmful to skin, but it is hard to remove, so you’ll appreciate the protection offered by a pair of thin vinyl gloves.

**The brush is important.** I prefer either China bristle or natural badger hair. My favorite brush is a 2-in. black China bristle with flagged ends and a chisel shape. The flagged ends leave a smooth finish, and a chisel cut makes it easier to flow the varnish on evenly. I also use a skew-cut, 1-in. sash brush for tight or low areas, like the recessed bevels on raised panel doors.

“Load” the bristles by soaking them all the way up to the ferrule in mineral spirits. Squeeze out the excess mineral spirits, but don’t shake or spin the solvent out. The bristles should be wet and the

brush should be loaded with solvent, which will help the varnish flow better and make cleanup easier when you’re done. (For more on preparing and cleaning your brushes, see pages 92 and 94.)

**Shaking isn’t necessary.** Just stir the varnish gently until any sheen-flattening agents are thoroughly dispersed, then pour some out into a clean, wide-mouth can. Coffee cans make excellent contain-

ers for applying varnish, but make sure to remove all the grounds before you pour in your finish. Leave several inches of can wall above the level of the varnish; you’ll need this area to properly load the brush.

The viscosity of varnishes varies considerably, but virtually all are too thick as they come from the can. I like to cut them with at least 10% to 15% naphtha



**Bed of nails.** Protruding nail points provide support when varnishing two sides of a workpiece at once.



## BRUSHWORK MAKES THE DIFFERENCE



**The dip.** After pouring varnish into a clean container, dip the brush into the varnish so that only the lower third of the bristles contains finish.



**A touch on the side.** Gently touch the inside wall of the container with the ends of the bristles, pressing slightly to get rid of excess finish.



**Starting stroke.** Holding the brush at 45°, press down just enough to deflect the tip, then drag the brush slowly along the grain.

or mineral spirits. Too thin is better than too thick. Several thin coats will lay out smoother and dry faster than a few thick ones.

Stir the solvent into the varnish gently. Try it on scrap to see if it flows out well, then make necessary adjustments by adding either more varnish or more solvent. The finish should flow smoothly off the end of the brush with very little drag.

### Applying a Sealer Coat

Since it is oil based, varnish will go over oil- or water-based stains and dyes, and over any type of pore filler. It can also go over a dried coat of linseed oil or Danish oil, which some woodworkers use to bring out curl or depth in figured woods.

Varnish is self sealing. This means you can put it directly on raw wood with no separate sealer coat. Some finishers like to cut their first coat as much as 50/50 with naphtha or mineral spirits so that it will soak in and dry faster. This isn't necessary, but can be helpful on soft or very porous woods, like pine and poplar. Omit this thinned coat if you've already treated the bare wood with Danish oil, pore filler, oil stain or wood conditioner.

Varnish will cure and adhere to both oily and non-oily woods, with the exception of rosewood and cocobolo. Woods in the rosewood family contain an antioxidant that can prevent varnish from drying. If you want to varnish these woods, first use a sealer coat of shellac.

### Applying Finish Coats

The application technique is the same, no matter how many coats you're applying. (See photos, above.) Dip the brush into the varnish so that only the lower third of the bristles contains finish. Do not scrape the brush on the edge of the container. Instead, gently touch the inside wall of the container with the ends of the bristles, pressing only slightly. This will take off just enough excess varnish to prevent drips as you move the brush to the wood.

Hold the brush by the ferrule and touch the bristles to the wood at about 45°. Press down enough to deflect just the tip so that the ends of the bristles lay out on the wood. Start to drag the brush slowly, about 2 in. per second, along the

grain of the wood. Go slowly and relax—brushing can be a very Zen-like activity.

The surface of the bristles should be shiny, with varnish flowing gently off the brush. As you continue to move the brush along the wood, the top bristles will start to dry. Keep the brush angle the same, but increase downward pressure to deflect the bristles more and bring more varnish to the surface. A good long-bristle brush will allow you to coat a 2-ft. strip before reloading. When you come to the end of a stroke, lift off the wood while still moving the brush forward.

With flat surfaces, start from one end and coat in only one direction with the grain. On raised panel doors, do the recesses first with the sash brush, then switch to the 2-in. brush for the panel and finally, the frame. On oddly shaped pieces (spindles, legs and rails), go whichever way is most convenient, but work with a drier brush to prevent drips. Be careful not to overapply near sharp edges and corners, where runs are most likely to occur.

**Dealing with drips and runs is inevitable.** It's always best to pick up a drip or run immediately, while the varnish is still wet. Unload your brush by slowly scraping it across the edge of the container to avoid bubbles. Go back over the drip or run with your brush, letting the tip of the bristles smooth it out as you pick up the excess. If you find a drip only after the finish is dry,



**Dealing with drips.** Remove hardened drips by carefully slicing them off with a razor blade.





**Ending stroke.** To get the last bit of finish out of the brush, increase downward pressure without changing brush angle.



**Lift off.** When you come to the end of the stroke, lift the brush off the wood while you're still moving the brush forward.



**Tipping off.** For a smoother finish, hold the bristles at 90° to the surface and run the tips lightly through the finish, moving with the grain.

level it by slicing off the bulb of the drip with a razor blade. Slice at a low angle, as shown in the bottom photo on the opposite page. Wait until the freshly exposed area cures, then sand lightly before the next coat.

When you've covered a manageable area and the varnish is still very wet, unload your brush by slowly scraping it on the edge of the container. With the brush at 90° to the wood, run just the bristle tips lightly through the wet varnish with the grain. "Tipping off" in this way helps eliminate brushstrokes. If you're working a small area like the top of an end table, you'll be able to tip off the entire surface at once. If you're doing a conference table, tip off the first few passes, then go back and coat the adjacent section.

Drying times vary from brand to brand, but all varnishes cure rather slowly. So to stay on the safe side, I apply only one coat per day. Building the finish too fast can leave the inside coats partially cured and result in a soft finish. The exception to this rule is the first coat that goes onto raw wood. Since it dries faster, you can put the first two coats on in one day.

Varnish's molecular structure changes as it cures. The cured coating can no longer be dissolved by its solvents. Each coat must adhere mechanically to the previous one. To help this adhesion, each coat should be lightly sanded

before recoating. I use 220-grit, self-lubricating paper between coats, and jump to 320- or 400-grit before the last coat. In areas that are hard to sand, I use either 0000 steel wool or a ScotchBrite™ abrasive pad.

I like to apply at least three coats of varnish. This builds enough of a finish to look good and wear well. And it's enough to rub out to satin, if that's the sheen you're after. For a deeper look or a gloss finish, add as many more coats as you need. If you want a very thick satin finish, stick with gloss until the last one or two coats, or rub down the gloss to produce a satin sheen.

### Rubbing Out the Finish

It's almost impossible to keep a varnish finish dust free, so I always plan to rub the finish out to smooth it. For a satin finish, wait at least one day after the last coat. Lightly scuff-sand the finish with a used piece of 400-grit, self-lubricating paper to remove all nubs in the coating. Rub the entire piece energetically with the grain using a grey ScotchBrite™ pad and paste wax. If you get too much wax on the surface and it seems smeary, sprinkle some water on the surface and go over it lightly with a clean piece of steel wool. The water will help congeal the wax and the steel wool pad will remove most of it.

For a gloss finish, wait at least two to three weeks before rubbing out. Smooth

the finish with 400-, then wet-sand with 600- to 1000-grit sandpaper, using mineral spirits or soapy water as a lubricant. When the surface is flat and smooth, rub it to gloss using automotive rubbing compound followed by polishing compound. (For more on rubbing out a finish, see AW #38 and #39.) ▲

### MICHAEL DRESDNER

*lives and works in Washington State.*



**Rub out for luster control.** To give the final coat a uniform satin luster, rub it down with some paste wax and a ScotchBrite™ or similar abrasive pad.



Adventures in

# HOLLOW TURNING

*A master turner's two-tool technique for creating thin-walled vessels*

by David Ellsworth



SPALTED WHITE OAK  
10 x 10

You're turning a solid chunk of green wood, cutting at great distances from the tool rest, using homemade tools that look like they were invented by a crooked mind. Best of all, you can't see what you're doing! You're either crazy, or you're turning a hollow form in green wood.

Anyone who has tried to turn hollow forms knows that the real fun comes when you push the process a smidge too far and end up with one bowl attached to the faceplate and another spinning around the shaft of the tool. This is nothing to get upset about; it's a necessary part of the learning process. I still "blow up" vessels from time to time, and [each mishap teaches me something. \(See bottom photo, page 59.\)](#) In this article, I'll explain what you need to know to get started in one of the most challenging and rewarding areas of woodturning.

## Why Green Wood?

I prefer turning hollow vessels from green wood because I can explore the interesting parts of the tree that you won't find in the lumberyard: branch overgrowths, roots, bark inclusions, areas of spalt and even the pith. In fact, some of my favorite pieces have come from logs that were either rotting in the forest or destined to be used as firewood. Green wood also cuts more easily than dry wood—which is important to remember if you're just beginning.



*Shape the outside first. Working with the blank mounted between a faceplate and a live center, use a gouge to rough out the form.*

## Getting Started

Before starting, I turn the exterior of the vessel very close to its final form. First, I mount the block between the spur center in the headstock and the ball-bearing live center in the tailstock. Then I rough out the form with the gouge at a very low speed, literally cutting away everything I don't want in the final object. (See photo, above.) As I come closer to the final form, I constantly check the material for new information—grain direction,

spalt, or dark stains that say, "Caution: Metal Inside." This way, I'm always free to reposition the form between centers if necessary, so I stay in charge of the design process. Once satisfied, I flatten the base with the gouge, remove the workpiece and mount it to a faceplate.

## Mounting Stock

There are numerous ways to mount a lump of wood to the lathe, and each method has strengths and weaknesses, depending on the size and condition of the wood being used. Convenience, common sense and safety are the factors I weigh when deciding how to mount the work. I'll go over several options below.

**For small pieces** (up to 6-in. by 6-in. by 6-in. size): I often use a waste block glued to the base of the form and either threaded onto a screw chuck or screwed to a faceplate. And I use gap-filling cyanoacrylate (CA) glue with accelerator because it will hold wet wood.

**For medium-size work** (up to 8-in. by 8-in. by 8-in. size): I often use a four-jaw mechanical chuck. This requires turning a short tenon on the base of the form that the chuck can grip. (See AW #43.)

**For larger forms:** I use a heavy-duty faceplate that's attached directly to the wood with 1-in. long, #14 self-tapping sheet-metal screws, leaving enough waste at the base of the form to hold the screws. Sheet-metal screws are far superior to wood screws in holding strength. I never use drywall screws.





***Riding the ways.***  
Hollowing out a vessel calls for an unconventional stance. The long handles on the author's shop-made hollowing tools provide much-needed leverage during the hollowing process.





**Bore with the straight tool.** Keeping away from the walls, excavate into the body of the vessel with a slight sweeping motion.



**Thin the walls with the bent tool.** Angle the bent point down slightly, then raise it to horizontal when entering the wood.

Once the object is securely mounted to the headstock, I reintroduce the tailstock and refine the shape to prepare for sanding. The tailstock helps reduce vibration and prevents the object from being thrown off the lathe.

### Sanding the Exterior

I like to minimize the need for sanding by making super-refined cuts from a Henry Taylor 1/2-in. Superflute bowl-turning gouge. (See Sources.) If I cut

the surface cleanly enough, I can begin sanding with 220-grit paper.

I don't sand with the lathe spinning. Instead, I hand-rotate the object and sand only where needed, using an electric drill and a circular sanding disc. Stationary sanding eliminates the moisture thrown into sandpaper by spinning wood and reduces heat production to nearly zero.

The foam-backed sanding discs that I use are extremely pliable and conform to

contoured surfaces for better sanding efficiency. The discs are also easy to make. Just use contact cement to glue a 1/2-in.-thick circle of carpet foam to a common 5-in.-dia. rubber sanding disc. Then stick on an "A-weight," adhesive-backed sanding disc. Depending on the wood and the surface I want, I usually finish sanding with a 320- or 400-grit disc.

### Hollowing Technique

Though they can be made in different sizes, there are only two basic types of hollowing tools: straight and bent. (See sidebar, page 61.) I use both to transform a solid turned object into a thin-walled vessel.

**The hollowing sequence is important.** It allows the unexcavated mass near the base of the vessel to provide support as you thin the walls closer to the opening. This is good insurance against breakage.

Do your hollowing in stages, repeating the same three steps to complete each stage. (See Fig. 1.) First, bore into the vessel with the straight tool, using a sweeping motion. (See left photo, above.) Second, use the bent tool to broaden the excavation, clearing mass from the bottom of the hole to the rim. (See right photo, above.) The third step is to refine the excavation and take the walls of the vessel to final thickness, using calipers to test thickness and uniformity.

As shown in Fig. 1, at

## FIG. 1: HOLLOWING SEQUENCE

### FIRST STAGE

**STEP 1:** Bore with the straight tool to 1/2-2/3 of final depth.

**STEP 2:** Broaden the hole with the bent tool.

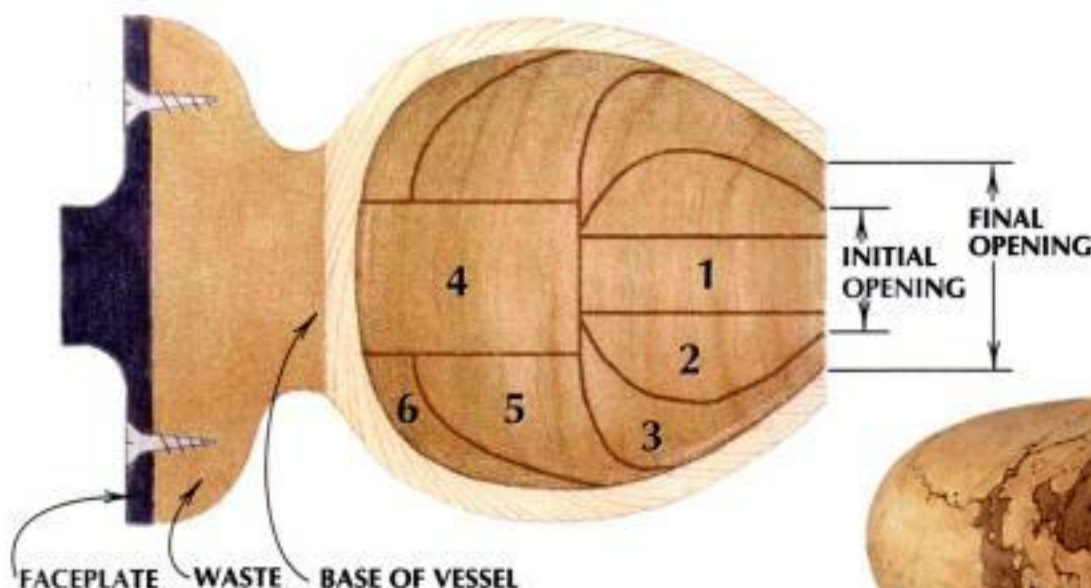
**STEP 3:** Cut upper walls of vessel to final thickness, using bent tool.

### SECOND STAGE

**STEP 4:** Bore with the straight tool to final depth.

**STEP 5:** Broaden with the bent tool.

**STEP 6:** Cut lower walls to final thickness with bent tool.



**SPALTED SUGAR MAPLE**  
5 x 11



least two stages of this hollowing sequence will be necessary for most vessels. As you work, you'll be surprised how quickly the excavation fills up with shavings and sawdust. To clear the debris, I stop the lathe, loosen the mass of waste with a bent rod, and blow it out with compressed air.

**Hand and body positions are crucial.** Good positioning provides tool control as well as physical comfort. (See photo, page 57.) The tool handles are extra long to provide added leverage when cutting long distances from the tool rest. To take advantage of this, place your hands at opposite ends of the tool so they form a triangle with your shoulders. As shown in the photo, I keep the heel of my left hand on the tool rest and hold the tool handle against my side with my right hand.

Notice that I'm not actually sitting on the lathe, but straddling it, supporting the weight of my body with a leg on the floor. In many cases, shorter people (I'm 6 ft., 2 in. tall) will need to add a low platform on both sides of the lathe to provide this foot support.

### Tips on Tool Use

As you might expect, there are a few rules you can follow to increase your control and minimize unwanted surprises when using hollowing tools.

- Keep your tools sharp.** It does no good to force any tool into a spinning piece when it cannot make a proper cut.

- Adjust tool-rest height** so that the edge of the cutting tip will be in the center of the workpiece when the tool is horizontal.

- Use the tip of the straight tool horizontally;** don't tilt it right or left.

- Always use the straight tool when cutting the protruding "nib"** at the bottom of the form. If you use the bent tool, it will grab on this nib and catch on the upward-rotating surface.

- Never enter a cut with the bent tool's cutter rotated above horizontal.** This will cause the wood to jam into the tip of the bent tool, which can result in a rather disturbing bang. Instead, begin the cut with the tool's tip pointed down at least a couple of degrees; then rotate it clockwise to horizontal as you begin to enter the wood.

If you accidentally try to take too heavy a cut with the bent tool, the tip will simply be forced down and away from the wood. This is exactly what it's supposed to do—a signal for you to lighten the cut.



**Shop-made calipers.** Inexpensive  $\frac{3}{16}$ -in.-dia. steel rod can be bent to form an effective tool for measuring wall thickness.



**Thick and thin.** Bandsawn sections through failed vessels can teach a lot. The larger vessel broke apart while the area near the opening was being worked. Too much material had already been removed close to the base, so support at the rim wasn't sufficient. The walls on the smaller vessel were thinned unevenly, especially at the base.

- Don't attempt to thin or refine wall thickness with the straight tool.** The tip of the tool is simply too well-supported by the shaft and will probably rip the thin wall the moment it makes contact.

- Finally: Learn to trust the sound and feel of the tool.** You have no choice but to sharpen these senses when hollow turning; you'll soon lose sight of the cutting edge as you deepen and broaden the interior of the vessel.

### Measuring Wall Thickness and Depth

As you approach the final wall thickness for your vessel, it's important to measure your progress. On most vessels, I like to make the wall thickness uniform throughout the vessel. Part of the fun of hollow turning is seeing how thin you can turn the walls, creating a vessel that can transmit light like a lampshade. Only by experimenting with different combinations of wood,

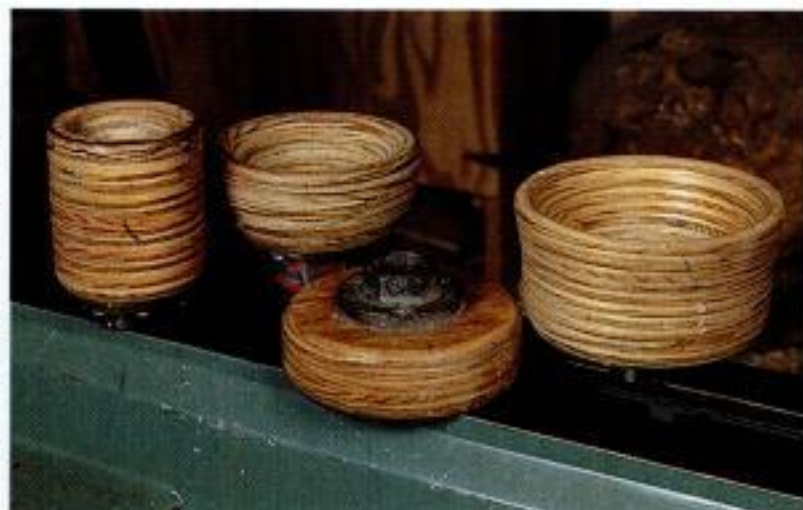




**Turning off the base.** Fit the hollowed end of the vessel in a jam chuck made from plywood, and center the tailstock in the base to part the vessel free.

### Chuck lineup.

The author makes jam chucks in different sizes by gluing pieces of  $\frac{3}{4}$ -in.-thick plywood together, attaching a faceplate and then turning the chucks to size. A coat of polyurethane promotes dimensional stability.



wall thickness, and vessel size and shape can you arrive at pleasing results.

Measuring wall thickness is important as you hollow a vessel, and you can do it without expensive calipers. My shop-made calipers won't cost you any more than \$1.25, and they work great. Just go to your local hardware store or building supplier and buy a 3-ft. length of  $\frac{3}{16}$ -in.-thick steel rod. Cut off about 24 in. for your calipers. The remaining 12 in. can be made into a pull rod for removing shavings by heating one end and beating it into a spoon shape, then turning a handle for the other end.

Bending the rod into a loop to establish a fixed distance between rod tips cre-

ates your measuring tool. (See top photo, previous page.) Set the distance between tips about  $\frac{1}{8}$  in. *greater* than the estimated thickness of the wall where you want to measure. If the wall feels  $\frac{3}{8}$  in. thick, for example, you'd set tip distance to  $\frac{1}{2}$  in. Insert one end of the rod into the bowl with the inner tip touching the interior surface. Hold your calipers so that the imaginary line between the two tips is perpendicular to the vessel wall. Now measure the gap between the outer tip and the exterior wall. If the tips of the rod are touching both inside and out, wall thickness is  $\frac{1}{2}$  in. A  $\frac{1}{8}$ -in. gap means  $\frac{3}{8}$ -in. wall thickness, and so on. You can bend the rod easily for different thickness settings, yet it's stiff enough to hold the setting in use.

**Measuring depth is also easy.** To measure depth, I place a framing square on the surface of the lathe ways so that the vertical arm touches the rim of the form. Then I insert any straight rod into the vessel until it bottoms out, mark the depth, withdraw the rod, and hold it above the form and parallel to the bed to gauge the depth.

### Finishing Off the Base with Jam Chucks

If you've ever tried to use a parting tool to separate a nearly finished "prized" bowl from its waste block, you know what true anxiety is. Why not simply turn it off? That's what jam chucks were designed for. Also, it doesn't matter if the form was originally mounted with screws, glued to a backing block or held by a mechanical chuck. Fitting the delicate open end of the vessel into a jam chuck gives you clear access to the base so you can safely turn away the waste area and shape the foot any way you wish. (See top photo, left.)

I make my jam chucks with glued-up scraps of  $\frac{3}{4}$ -in. plywood that are permanently fixed to old faceplates. They're rough sanded and finished with polyurethane so they won't change shape in varying weather conditions. Three or four of these chucks in different heights and diameters will work for a huge range of both hollow forms and open bowls—especially those with natural edges. (See bottom photo, left.)

To mount the form into the chuck, first place a thin layer of foam rubber between the object and the chuck to prevent wood-to-wood contact. This also provides traction so the object won't slip in the chuck when turning off the base. Place the point of the ball-bearing tailstock center into the exact center of the foot or waste block, and you're ready to turn off the foot. Well, nearly ready...

Hollow forms need to be centered both at the base and in the jam chuck itself, and finding the "exact" center of the base may take several tries. One way is to bring the tool rest close to the object and hand-rotate the form so you can see if it's rotating true. If not, make adjustments by loosening the tailstock and repositioning the form; first in the chuck and then, if needed, by relocating the point of the tailstock center in the base. Re-tighten the tailstock and check again by hand-rotating the form.

These adjustments are usually very slight—don't use a cone-shaped point in your tailstock center because it will bore a huge divot in the base that is anything but subtle. What's best is a  $\frac{1}{2}$ -in.-dia. cup center with a tip that protrudes no more than  $\frac{1}{16}$  in. Also, make sure that the foam rubber contacts the edge of the chuck without crimps and that the lathe speed is set low. Now you're ready to finish turning the base.

## SOURCES

**Henry Taylor Superflute gouges** are available from Woodcraft Supply Corp. (800-225-1153). *Circle #616*

**Straight and bent tools** are available from Woodcraft Supply Corp. and Craft Supplies (800-551-8876). *Circle #617*



## Drying Green Wood

The only universal "truth" in all of woodworking is that wood moves! Traditional bowl turners have solved this problem by roughing out green bowls from the log, slow-drying them for a year or so, and then turning to final form.

You usually turn a hollow form down to its finished wall thickness in one shot. The resulting shell can then be dried in a matter of days or weeks, depending on species, overall size and wall thickness.

One excellent way to dry the object is to place it in a brown paper bag. The moisture from the wood is absorbed by the bag, and then slowly evaporates. Once the object stops losing weight, it's dry. But check it occasionally for mold and change the bags regularly if mold does form.

The amount of shell distortion during drying depends primarily on species, wall thickness, and the speed of the drying process. For example, if I turn a freshly cut green maple bowl to a consistent wall thickness of 1/8 in. and set it in the sun, it will dry in a matter of hours and stretch into an elliptical shape—but it won't crack, usually not even in the pith!

Why? Because the fibers of the green wood are elastic and conduct the release of natural tensions within the wood; and because there's almost no mass in the wall to prevent distortion as the wood dries. Now try that with a bowl or vessel that has a 1/8-in.-thick rim, but is 3/8 in. thick at the base. That's a 300% increase in mass: Boom!

## Finishing Green Wood Vessels and Bowls

Every woodworker seems to have a favorite finish or two. Fortunately, all finishes can be used when working with green materials if you establish a workable application method.

If I want a smoothly polished thin film finish, I'll glob on a first coat of Waterlox "Transparent" (see AW #57) immediately after sanding, but before hollowing out the form. This helps to protect the surface from contamination

## HOLLOWING TOOLS

Cutting the interior of a hollow form involves both straight and bent tools. If you're working through a reasonably large opening—which I highly recommend for beginners—the entire interior can be completed with the two tools shown in this article.

Several mail-order companies sell hollowing tools. (See Sources.) But you can also make your own, as I do. To hollow miniature or extremely delicate vessels, I've made straight and bent tools from old screwdrivers and Allen wrenches. The tools in this article have shafts made from drill rod. My cutting tips are 10% cobalt high-speed steel, square in section and either 3/16 in. or 1/4 in. on a side. I bore a hole in the drill-rod end, and attach the tip with gap-filling cyanoacrylate glue (with accelerator). That's right, super glue! And I've never lost a tip.

The safest and most efficient angle for the bent tool cutter is 45°. A smaller angle will cause the tip to race through the wood, and a larger angle will cause the tip to dip or roll downward. I've also found that the optimum length of the tip extension is about 3/4 in.

Sharpening the tips is easy. The bevel that backs up the cutting edge should be about 20° off vertical, and the edge itself should form an even, round tip, as shown in the photos.

Long handles are a must for working in hollow forms because the extra length provides balance when working at great distances from the tool rest.

My handles are designed for efficiency, not beauty; they are rough turned. These textured surfaces provide extra traction so the handles won't slip in my hands. I turn the back end of my handles slightly off center, to a comfortable elliptical shape. I glue the shafts to the handles with five-minute epoxy.

—D.E.

**Drill rod and high-speed steel.** The author's straight and bent tools are simple and very effective for hollowing work. The steel cutters are glued into holes bored in the drill rod shanks, using cyanoacrylate adhesive. On both tools, the bevel is ground at 20°, forming a rounded tip.



SPALTED BLACK BIRCH  
8 x 7

due to dust and handling. Once the shell is turned, I apply more Waterlox as necessary to fill the pores. As the wood dries, so does the varnish.

When both are dry, I buff off the finish residue on a 6-in.-dia. cotton-stitched buffing wheel. The final result is a hard, lustrous, nonglossy finish.

On vessels with textured exteriors produced by shear cuts from the gouge, I usually prefer a spray-on lacquer finish. I've had good results using Krylon "Crystal Clear" #1303, an acrylic lacquer commonly used on charcoal and

pastel drawings (available through paint or art-supply stores). When applied thinly, the lacquer will provide an invisible finish that can either be vacuumed with a brush attachment or wiped with a damp cloth.

Experimentation is crucial in all aspects of hollow turning. It makes each new piece of wood a new challenge. If you're just beginning, start with a small log of soft maple or birch. If you choose something with gorgeous figure or a fancy hunk of burl, you'll suddenly find you're married to its beauty—or its cost—and are too worried about making mistakes to enjoy the learning process. ▲



## TURNING ON THE COMPUTER

Want to learn more about wood turning and meet other turners? Check out the message boards on AMERICAN WOODWORKER Online through America Online. (See page 26 for AOL information.) And join AW contributing editor (and expert turner) Stephen Blenk every Wednesday evening—9:30 pm eastern time—in our regularly scheduled AW Online "chat room" for turning enthusiasts.



**DAVID ELLSWORTH**  
is a master woodturner who teaches and turns in Bucks County, Pennsylvania.



# Tablesaw Fences

*Boost your saw's performance with an aftermarket fence*



**A good fence makes a good saw.** A premium rip fence will improve any saw. It will help you make truly straight, clean, accurate cuts quickly and efficiently.

**N**ever before have there been more tablesaw fences to choose from. For this Buyer's Guide, we tested 26 different models costing from \$159 to \$420. Quite a few of these fences come as standard equipment on high-end contractor-type tablesaws or cabinet saws. But our test models can also be purchased separately and installed on just about any tablesaw.

**Is there a new fence in your future?** The answer is probably "yes" if any of these statements apply:

1) Your current fence doesn't lock rigidly enough or frequently goes out of alignment so it doesn't lock parallel to the blade. Some symptoms of poor fence performance are binding during the cut, burned edges, and edges that aren't perfectly straight.

2) You're planning to buy a new tablesaw, and you want table extensions on one or both sides.

3) You plan to upgrade an existing tablesaw with side extensions, and need longer rails to support the fence.

## The Benefits of a Better Fence

Woodworker Bill Biesemeyer had the right idea back in 1980 when he designed the first widely available aftermarket fence. Structurally simple, straight, rigid and bulletproof, the Biesemeyer fence set the standard for all aftermarket fences. In our Shop Test, you'll see many imitations of the Biesemeyer design.

A good fence stays straight, parallel to the sawblade, and square to the table through its full range of movement across the saw table. Match up



a top-notch fence with a premium blade that spins true, and you'll be able to rip gluelines, eliminating the need to run sawn edges through the jointer. Factor in a fine measurement scale, solid locking action, and smooth movement across the table, and you've just supercharged your tablesaw and made your life a lot easier.

Precision, durability, and easy repeatability of fence setups are major selling points for aftermarket fences. But these fences are also important because of the rails they ride on. The beefy steel or aluminum rails are designed to be installed easily on both manufactured and shop-made extension tables. All our test fences achieved the goals above in different ways, with different levels of success. This Buyer's Guide will help you choose the right fence for your budget and for the type of woodworking you do. But before we jump into "What's Important," let's clarify some terminology.

You'll notice that there are two charts in this Buyer's Guide—one covering "Commercial" fences, the other devoted to "Home Shop" models. Commercial aftermarket fences were introduced first, and were aimed primarily at professional woodworkers who owned cabinet-type tablesaws. The popularity of these fences prompted manufacturers to develop downsized versions for small-shop woodworkers with contractor's saws.

Our tests revealed that the distinctions between these two fence classifications are blurry. Both Commercial and Home Shop fences can be used on contractor's saws or cabinet saws. And we didn't find that smaller meant less rigid, less durable, or less precise. The price differences aren't even that great in some cases. For example, Powermatic's Home Shop fence costs just \$20 less than its big brother. What you *do* get with some commercial models is a higher, longer, heavier fence.

### Choosing a Fence— What's Important?

When you're shelling out several hundred bucks or more, you want a fence that delivers top performance. Here's what that means, in order of importance:

**Parallel and straight.** Once adjusted parallel to the saw blade, most of our test fences had no problem remaining parallel when locked in place anywhere on their rails. The Mule Accusquare fence was the one exception; its out-of-flat front rail caused parallelism problems.

All the fences in our test showed excellent rigidity when locked in place. These



**Different size, same performance.** "Commercial" fences, like the Biesemeyer shown at right, are longer, taller, and heavier than their "Home Shop" counterparts. But both types perform equally well.

fences didn't deflect enough to affect the quality of the cut.

Testing fence straightness revealed that some of the fences in our test group were straighter than others. The Voss Evolution I and Rousseau SF 2050 were the only fences with straightness ratings below excellent or very good. (See chart.) Both of these fences have polyethylene faces, which offer the advantage of low friction. But we found the poly facing material tended to vary in thickness and deflect slightly around mounting screws. The straightest poly face was on the Jet Xacta Home Shop fence.

**Square to the table.** Squareness of the fence faces to the saw table isn't quite as important as straightness for general ripping. But it is critical if you plan to use your fence for cutting tenon shoulders or feeding workpieces on edge.

We liked the fences that can be adjusted for vertical squareness to the table: the Shop Fox, Rousseau SF 2050 and the Home Shop and Commercial versions of the Jet Xacta and Delta fences. Of the remaining non-adjustable fences, the Paralok, Powermatic Accufence Commercial, General Home Shop, Vega Utility, Sears Exact-I-Rip, Voss Pro Rip and Modulus SF-10 tested out with both faces dead-square to the table.

**Scale readability.** A scale stretches along the front rail of each fence; you read it by looking through a cursor. We found that scale readability varied because of cursor design and scale mark-

ings. We were looking for clear, precise, easy-to-read scales, and found that the Biesemeyer and General T-Fence System scales came out on top. Also earning excellent ratings in this category: Powermatic Accufence Commercial, Vega Commercial, Modulus SSF-100, Voss Evolution I and Pro Rip, Shop Fox, and Mule Accusquare.

**The hands-on rating.** This rating covers a lot of territory, as well it should. It's meant to measure how easy it is to use a fence, day in and day out. For example, we soon developed a preference for fences with locking levers that can simply be flipped up and down. Locking the Mule Accusquare requires turning a knob, and the Modulus SF-10 has a lever that must be turned instead of flipped. These two mechanisms were less convenient to use.

**Ease of fence movement** is another factor in the hands-on equation. Here, our testers' opinions varied on the degree of resistance that's desirable when sliding the fence across its rails. Some of us liked the ball-bearing smoothness that enables you to move the Shop Fox and Sommerville Excalibur Precision fences with the tip of your finger. But others preferred fences with more resistance, which won't wander while you tap them into fine adjustment. Of all the Biesemeyer-type fences, the two Powermatic models were easiest to move.

*Continued on page 68.*





POWERMATIC ACCU-FENCE



BIESEMEYER



DELTA UNIFENCE®



VEGA PROFESSIONAL



SOMMERVILLE EXCALIBUR PRECISION

## COMMERCIAL FENCES

| Brand & Model                                                                                                                                    | Street Price | PERFORMANCE RATINGS |                 |                   |          | OVERALL RATINGS |   |   |   |   | RAILS        |                    |
|--------------------------------------------------------------------------------------------------------------------------------------------------|--------------|---------------------|-----------------|-------------------|----------|-----------------|---|---|---|---|--------------|--------------------|
|                                                                                                                                                  |              | Straight            | Square to table | Scale Readability | Hands-on | 1               | 2 | 3 | 4 | 5 | Length (in.) | Rip Capacity (in.) |
|  <b>Powermatic Accu-Fence</b><br>(800) 248-0144<br>Circle #618  | \$340        | 5                   | 5               | 5                 | 5        |                 |   |   |   |   | 84**         | 50R, 12L           |
|  <b>Biesemeyer</b><br>(800) 438-2486<br>Circle #619             | \$350        | 5                   | 4.5             | 5                 | 4.5      |                 |   |   |   |   | 84**         | 50R, 14L           |
|  <b>Delta Unifence® 36-906</b><br>(800) 438-2486<br>Circle #620 | \$360        | 5                   | 5               | 4.5               | 4        |                 |   |   |   |   | 83*          | 52 1/4R, 9L        |
|  <b>Vega Professional</b><br>(800) 222-8342<br>Circle #621      | \$320        | 5                   | 4.5             | 4                 | 5        |                 |   |   |   |   | 72*          | 50R, 7L            |
| <b>Sommerville Excalibur Precision</b><br>(800) 357-4118<br>Circle #622                                                                          | \$339        | 5                   | 4.5             | 3.5               | 5        |                 |   |   |   |   | 78**         | 50R, 12L           |
| <b>Paralok II</b><br>(800) 423-9611<br>Circle #623                                                                                               | \$350        | 5                   | 5               | 4                 | 5        |                 |   |   |   |   | 72**         | 50 1/2R, 16L       |
| <b>Vega Commercial</b><br>(800) 222-8342<br>Circle #621                                                                                          | \$310        | 4.5                 | 4               | 5                 | 4.5      |                 |   |   |   |   | 82*          | 50 1/2R, 11L       |
| <b>Jet Xacta</b><br>(800) 274-6848<br>Circle #624                                                                                                | \$330        | 4                   | 4.5             | 4.5               | 4.5      |                 |   |   |   |   | 84**         | 50R, 13 3/4L       |
| <b>General T-Fence System</b><br>(819) 472-1161<br>Circle #625                                                                                   | \$330        | 5                   | 4.5             | 5                 | 4        |                 |   |   |   |   | 84**         | 52R, 12L           |
| <b>Modulus SSF-100</b><br>(800) 633-8587<br>Circle #626                                                                                          | \$420        | 4.5                 | 4               | 5                 | 3.5      |                 |   |   |   |   | 84*          | 52R, 12L           |
| <b>Excalibur Industrial</b><br>(800) 387-9789<br>Circle #627                                                                                     | \$359        | 4.5                 | 4               | 4.5               | 4        |                 |   |   |   |   | 85 1/4       | 51 1/2R, 13L       |
| <b>Voss Evolution I</b><br>(800) 386-5883<br>Circle #628                                                                                         | \$319        | 3.5                 | 4               | 5                 | 4        |                 |   |   |   |   | 80**         | 50R, 10L           |

### KEY

Y = yes, N = no, OPT = optional, R=right, L=left.  
\*Alternate rail lengths available. \*\*Custom and alternate rail lengths available. \*\*\*For Vega accessories only.

### GUIDE TO THE RATINGS

5 = excellent, 4 = very good, 3 = good, 2 = fair, 1 = poor.

**Straight:** Overall straightness of fence faces.

**Square to table:** Squareness of the fence faces to the table.

**Scale readability:** How the cursor and scale work to provide precise, easy readings.

**Hands-on rating:** Overall ease of use for basic operations.

**The overall rating** includes the four performance ratings, plus extra credit for special features.



PARALOK II



## FENCE FEATURES

| Length (in.) | Height (in.)   | Lift-off | Micro-Adjust | Rear Lock | T-Slots | COMMENTS                                                                                                                                                                                    |
|--------------|----------------|----------|--------------|-----------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 41 3/4       | 2 1/2          | Y        | N            | N         | N       | Replaceable faces; handle adjusts to prevent racking while adjusting on rail; paint-free wear surface on rails reduces sliding friction.                                                    |
| 42           | 2 1/2          | Y        | N            | N         | N       | Paint-free wear surface on rails reduces sliding friction; magnetic handle stay aids sliding movement; excellent scale and cursor.                                                          |
| 43           | 3 1/2 or 1 1/2 | Y        | N            | N         | N       | Only "Commercial" model that mounts as high or low fence; adjusts fore and aft; easiest fence to adjust parallel to blade; adjusts for vertical square; easy attachment of auxiliary fence. |
| 42           | 2 1/2          | Y        | Y            | N         | Y***    | Slides smoothly; best micro-adjust; easiest installation; rear bracket prevents fence lift-up during use.                                                                                   |
| 44 1/2       | 2 1/2          | Y        | N            | Y         | Y       | Easiest movement; lightweight but well-engineered; easiest removal of rear-locking fence.                                                                                                   |
| 36           | 3 1/2          | N        | N            | Y         | N       | Straightest fence; slides easily; most difficult to install because of cable and pulley mounting system; removable from end of rails only.                                                  |
| 41           | 2 1/2          | Y        | Y            | N         | N       | Slides smoothly; micro-adjust doesn't work as well as those on other Vega models.                                                                                                           |
| 42           | 2 1/2          | Y        | N            | N         | N       | Removable polyethylene faces; adjusts for vertical square; nice magnetic handle stay; painted wear surface on rails inhibits sliding movement.                                              |
| 42 1/2       | 2 1/2          | Y        | N            | N         | N       | Identical to Biesemeyer, but painted wear surface on rails and lack of magnet in lever inhibit sliding movement.                                                                            |
| 60           | 2 3/8          | Y        | N            | Y         | Y       | Longest fence; adjusts fore and aft; good for cutting sheet goods; will fit Biesemeyer rails; rotating lock instead of lever.                                                               |
| 40 1/2       | 2 1/2          | Y        | N            | Y         | Y       | Heaviest fence; polyethylene faces deflect slightly between mounting screws.                                                                                                                |
| 41 1/2       | 2 5/8          | Y        | OPT          | N         | OPT     | Replaceable polyethylene faces; uncomfortable handle; rear bracket prevents fence lift-up during use.                                                                                       |

## HOW WE TESTED

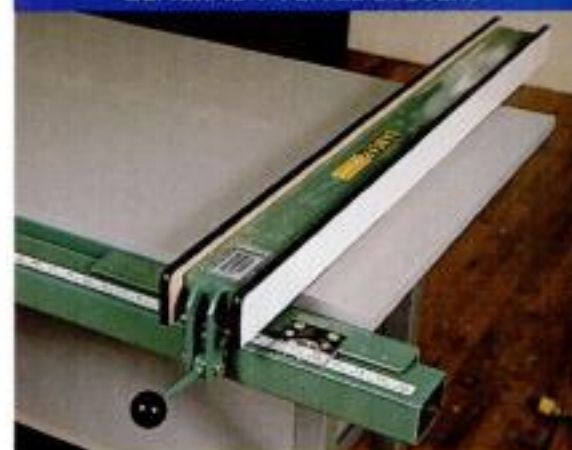
All of the fences were installed according to the manufacturers' instructions. To handle 26 different models, we used two cabinet saws, two contractor's saws, and a heavy-duty test platform with the same dimensions as a saw tabletop with side extension tables.

We put each fence through its full range of settings and adjustments, using it to guide solid boards and plywood when making different cuts. Then we identified four important performance criteria and tested each model to obtain the performance ratings described at left.

## COMMENTS



GENERAL T-FENCE SYSTEM



MODULUS SSF-100



EXCALIBUR INDUSTRIAL



VEGA COMMERCIAL



VOSS EVOLUTION I







VEGA UTILITY



JET XACTA HOME SHOP



BIESEMEYER HOME SHOP



DELTA PRECISION SAW GUIDE



POWERMATIC ACCU-FENCE HOME SHOP

## HOME SHOP FENCES

| Brand & Model                                                                                                                                                 | Street Price | PERFORMANCE RATINGS |                 |                   |          | OVERALL RATINGS |   |   |   |   | RAILS                             |                                                                       |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|---------------------|-----------------|-------------------|----------|-----------------|---|---|---|---|-----------------------------------|-----------------------------------------------------------------------|
|                                                                                                                                                               |              | Straight            | Square to table | Scale Readability | Hands-on | 1               | 2 | 3 | 4 | 5 | Length (in.)                      | Rip Capacity (in.)                                                    |
|  <b>Vega Utility</b><br>(800) 222-8342<br>Circle #621                        | \$235        | 5                   | 5               | 4                 | 5        | ██████████      |   |   |   |   | 72*                               | 50 <sup>1</sup> / <sub>2</sub> R,<br>7 <sup>1</sup> / <sub>2</sub> L  |
|  <b>Jet Xacta Home Shop</b><br>(800) 274-6848<br>Circle #624                 | \$260        | 4.5                 | 5               | 4.5               | 4.5      | ██████████      |   |   |   |   | 60**                              | 30 <sup>1</sup> / <sub>8</sub> R,<br>12 <sup>3</sup> / <sub>4</sub> L |
|  <b>Biesemeyer Home Shop</b><br>(800) 438-2486<br>Circle #619                | \$260        | 5                   | 4.5             | 5                 | 4.5      | ██████████      |   |   |   |   | 70**                              | 40 <sup>1</sup> / <sub>4</sub> R,<br>12L                              |
|  <b>Delta Precision Saw Guide 36-921</b><br>(800) 438-2486<br>Circle #620    | \$210        | 4.5                 | 5               | 4                 | 4        | ██████████      |   |   |   |   | 57 <sup>3</sup> / <sub>4</sub> *  | 29R,<br>11 <sup>1</sup> / <sub>2</sub> L                              |
|  <b>Powermatic Accu-fence Home Shop</b><br>(800) 248-0144<br>Circle #618     | \$320        | 4.5                 | 4.5             | 4                 | 5        | ██████████      |   |   |   |   | 58 <sup>1</sup> / <sub>8</sub> ** | 28 <sup>1</sup> / <sub>8</sub> R,<br>12L                              |
|  <b>Sears XR 2424</b><br>(Call or visit local Sears store.)<br>Circle #629 | \$159        | 5                   | 4               | 3                 | 4.5      | ██████████      |   |   |   |   | 61                                | 24R,<br>24L                                                           |
| <b>Shop Fox</b><br>(360) 734-3482<br>Circle #630                                                                                                              | \$275        | 4.5                 | 4.5             | 5                 | 4        | ██████████      |   |   |   |   | 47*                               | 24 <sup>3</sup> / <sub>8</sub> R,<br>8 <sup>1</sup> / <sub>2</sub> L  |
| <b>General Home Shop</b><br>(819) 472-1161<br>Circle #625                                                                                                     | \$295        | 4.5                 | 5               | 4                 | 4        | ██████████      |   |   |   |   | 80**                              | 50R,<br>12L                                                           |
| <b>JETFENCE</b><br>(800) 274-6848<br>Circle #624                                                                                                              | \$179        | 4.5                 | 4.5             | 4                 | 4        | ██████████      |   |   |   |   | 57 <sup>1</sup> / <sub>4</sub>    | 30 <sup>1</sup> / <sub>4</sub> R,<br>12 <sup>1</sup> / <sub>2</sub> L |
| <b>Voss Pro Rip</b><br>(800) 386-5883<br>Circle #628                                                                                                          | \$269        | 4.5                 | 5               | 5                 | 4        | ██████████      |   |   |   |   | 80*                               | 50R,<br>10L                                                           |
| <b>Sears Exact-I-Rip #29901</b><br>(Call or visit local Sears store.)<br>Circle #629                                                                          | \$270        | 4.5                 | 5               | 3                 | 4.5      | ██████████      |   |   |   |   | 70                                | 31 <sup>1</sup> / <sub>4</sub> R,<br>23 <sup>3</sup> / <sub>4</sub> L |
| <b>Rousseau SF 2050</b><br>(800) 635-3416<br>Circle #631                                                                                                      | \$201        | 3                   | 5               | 4.5               | 4        | ██████████      |   |   |   |   | 82*                               | 53R,<br>12L                                                           |
| <b>Modulus SF-10 Home Shop</b><br>(800) 633-8587<br>Circle #626                                                                                               | \$300        | 4.5                 | 5               | 4.5               | 3.5      | ██████████      |   |   |   |   | 80*                               | 50R,<br>12L                                                           |
| <b>Mule Accusquare</b><br>(905) 898-4110<br>Circle #632                                                                                                       | \$189        | 5                   | 4               | 5                 | 3.5      | ██████████      |   |   |   |   | 48**                              | 29R,<br>6L                                                            |

See previous page for key to chart.



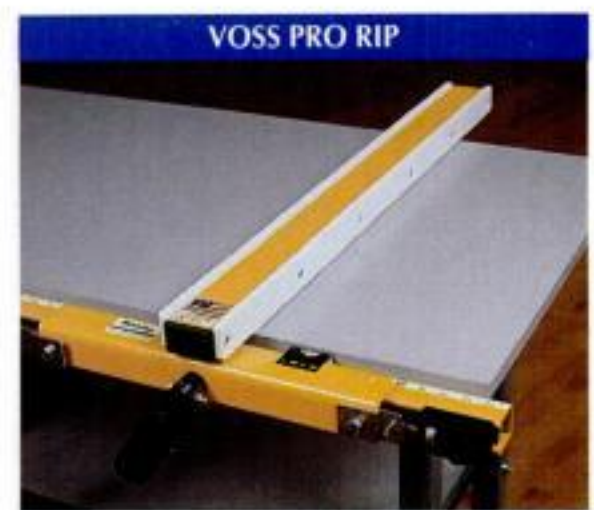
SEARS XR 2424



SHOP FOX



| FENCE FEATURES |              |          |              |           |         | COMMENTS                                                                                                                                          |
|----------------|--------------|----------|--------------|-----------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| Length (in.)   | Height (in.) | Lift-off | Micro-Adjust | Rear Lock | T-Slots |                                                                                                                                                   |
| 36             | 2 1/2        | Y        | Y            | N         | Y       | Smaller version of Vega Professional.                                                                                                             |
| 36             | 2            | Y        | N            | N         | N       | Smaller version of Commercial model.                                                                                                              |
| 36             | 2            | Y        | N            | N         | N       | Smaller version of Commercial model.                                                                                                              |
| 32             | 2 3/4        | Y        | N            | N         | N       | Smaller version of Delta Unifence®.                                                                                                               |
| 36 1/4         | 2            | Y        | N            | N         | N       | Smaller version of Commercial model; fence can ride on table or rear rail.                                                                        |
| 32             | 2 3/4        | Y        | Y            | Y         | Y       | Lightweight; dead-straight faces; lowest price; balky rubber-wheel micro-adjust.                                                                  |
| 39 3/4         | 3 1/2        | N        | N            | Y         | Y       | Highest home shop fence; smooth sliding; adjusts for vertical square; left-hand cursor collects sawdust easily; removable from end of rails only. |
| 36             | 2            | Y        | N            | N         | N       | Smaller version of Commercial model; mismachined cursor screw holes prevent adjustment of cursor.                                                 |
| 31             | 2 1/2        | Y        | N            | N         | N       | Lightweight; low price.                                                                                                                           |
| 36             | 1 3/4        | Y        | OPT          | N         | N       | Smaller version of Voss Evolution I.                                                                                                              |
| 36 1/2         | 3            | Y        | Y            | Y         | Y       | Lightweight; fussy to align parallel to blade; micro-adjust.                                                                                      |
| 35 3/4         | 2 1/2        | Y        | N            | N         | N       | Easy installation; greatest rip capacity; replaceable polyethylene faces; adjusts for vertical square; faces out of flat.                         |
| 41             | 1 7/8        | Y        | N            | OPT       | Y       | Handle locks by rotation instead of lever.                                                                                                        |
| 36             | 2 1/2        | N        | N            | N         | Y       | Easy installation, but out-of-flat rail caused fence parallelism problems; removable from end of rails only.                                      |







**Drafting-table accuracy.** Paralok's wire-and-pulley suspension (left) provides excellent, consistent parallelism of the fence to the saw blade.

**Micro-adjustment.** A micro-adjust mechanism, like this one on the Vega Commercial (below), makes it easy to adjust for width of cut in very fine increments.



## HIGHS AND LOWS

### BEST INSTRUCTION MANUAL

Delta Unifence® and  
Delta Precision Saw Guide

### WORST INSTRUCTION MANUAL

Excalibur Industrial and  
Mule Accusquare

### EASIEST INSTALLATION

Vega Professional and Vega Utility

### MOST DIFFICULT INSTALLATION

Paralok II

### STRAIGHTEST FENCE

Paralok II

### BEST SCALE

Biesemeyer Commercial & Home Shop  
General T-Fence System

### EASIEST MOVEMENT

Shop Fox and Excalibur Precision

### EASIEST PARALLEL AND SQUARE ADJUSTMENT

Delta Unifence®

### LONGEST FENCE

Modulus SSF-100 (60 in.)

### GREATEST RIP CAPACITY

Rousseau SF 2050 (53 in.)

### SMALLEST RIP CAPACITY

Sears XR 2424 (24 in.)

### BEST MICRO-ADJUSTMENT

Vega Professional and Vega Utility

**Fence removal** is important, too. It enables you to get the fence out of the way for crosscutting long stock or to clear off the extension table. You can remove all but three of these fences by simply lifting them off the saw table. In the lift-off group, the Modulus SSF-100, at 60 in. long, is too awkward to lift very easily. And the Excalibur Industrial, at 30 lbs., also requires extra effort. To remove the Paralok, Shop Fox and Mule Accusquare fences, you have to slide each fence completely off the end of the rails.

## Special Features

Some models have special features that may factor into your buying decision. Here's a look at these offerings:

**Fore-and-aft adjustment.** The Modulus SSF-100 and the Delta fences can be pulled toward the operator and locked there to provide more bearing surface for workpieces before they enter the blade—an advantage when cutting sheet goods and long boards. This feature is also handy when you're ripping reactive lumber, which tends to spread apart as you rip. The Delta fences can even slide far enough to work as stops for making identical crosscuts with the miter gauge.

**Micro-adjustment.** Micro-adjust mechanisms on some models let you dial in slight adjustments with the turn of a knob—a nice feature. (See bottom photo,

left.) The Vega and Sears fences come with an integral micro-adjust mechanism. Voss offers an optional micro-adjuster. We liked the mechanisms on the Vega Professional and Utility models the best.

**Rear locking.** As noted in the chart, some fences have rear locking mechanisms or slotted brackets to prevent the fence from lifting off the table when you mount hold-downs or featherboards on the fence. But we found lifting negligible on all the fences in our test, whether they were equipped with rear locks or not.

**T-slots.** T-shaped slots in the top or faces of certain fences accept accessories like fingerboards, push sticks and other hold-downs.

## Installation Notes

You can install any of these fences on any saw within an hour or two. The easiest to install were the Vega Professional and Vega Utility. The Paralok, the only fence that mounts on a system of wires and pulleys, pushed us to two hours. (See top photo, left.)

Installation is fairly simple for all fences. You bolt front and back rails to the saw table and to the extension table. In some cases, the fence can be mounted to the saw table using existing holes; otherwise, you'll have to bore new ones. It's critical to mount the front rail absolutely straight. If the rail bows in or out, the fence won't stay parallel to the saw blade along its length of travel. Shim the rail if necessary to make it straight.

## Recommendations

We couldn't find any poor performers among the 26 test fences. As the charts show, all earned overall ratings of "good" or better, and nearly all scored "excellent" in at least one performance test.

In the Commercial group, we gave four fences our "Editors' Choice" awards—best performance regardless of price: the Powermatic Accu-fence, Biesemeyer, Delta Unifence®, and Vega Professional.

There were five Editors' Choices among the Home Shop models—the Vega Utility, Jet Xacta, Biesemeyer, Delta Precision Saw Guide and Powermatic Accu-fence.

We didn't choose a Best Buy—best performance for the price—in the Commercial category, since prices were so similar, but in the Home Shop category, the choice was easy: the Sears XR 2424. You can't beat the \$159 price tag, and the fence scored high in crucial categories like straightness and squareness. ▲



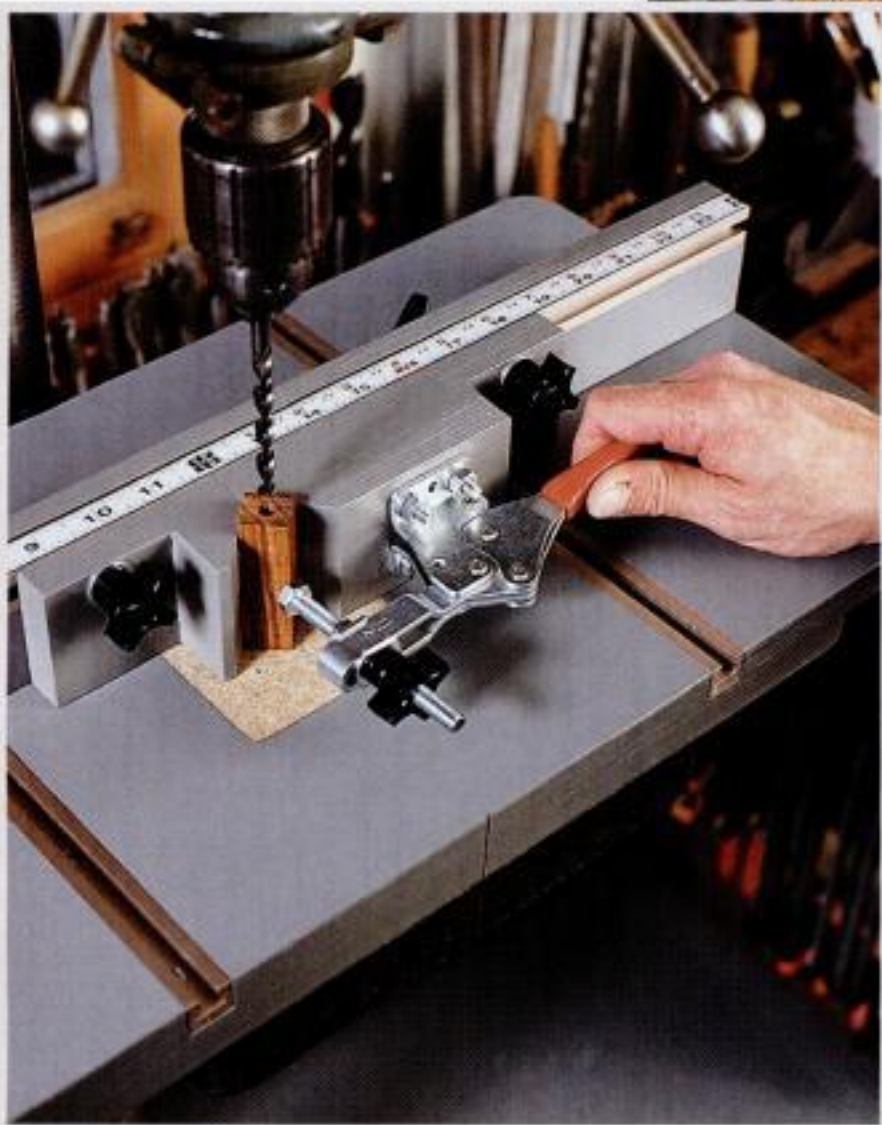
# Drill Press Table

*Transform a boring machine into a precision instrument*

by Craig W. Bentzley



**A thrill to drill.** Bentzley's add-on table offers time-saving setups, super accuracy, and easy adaptability to all kinds of jigs and clamps.



**Jigging up.** The vertical V-block jig is perfect for drilling pen blanks. Turn the page for more jigs.

**T**he drill press is indispensable in any woodshop, but the standard cast-iron table is woefully inadequate. Most drill press tables are too small to adequately support larger work, and the ribs underneath always seem to interfere with clamps. Plus, there's no easy way to accurately position duplicate parts for production runs.

My shop-made table eliminates these problems—it turns your drill press into a precision boring machine. And the table's extruded aluminum T-track (available from Hartville Tool Co., 800-345-2396) will accept a wide assortment of jigs and fixtures.

The fence slides easily and locks securely on the table's T-track, and it has its own T-track to hold stop blocks and other helpers. A sacrificial medium-density fiberboard (MDF) insert fits in the center of the table, so when you forget to set your depth stop, you won't ruin that expensive Forstner bit. When you need to replace the insert, you can just pop it out with your finger through the hole underneath. ▶



**CRAIG W. BENTZLEY**

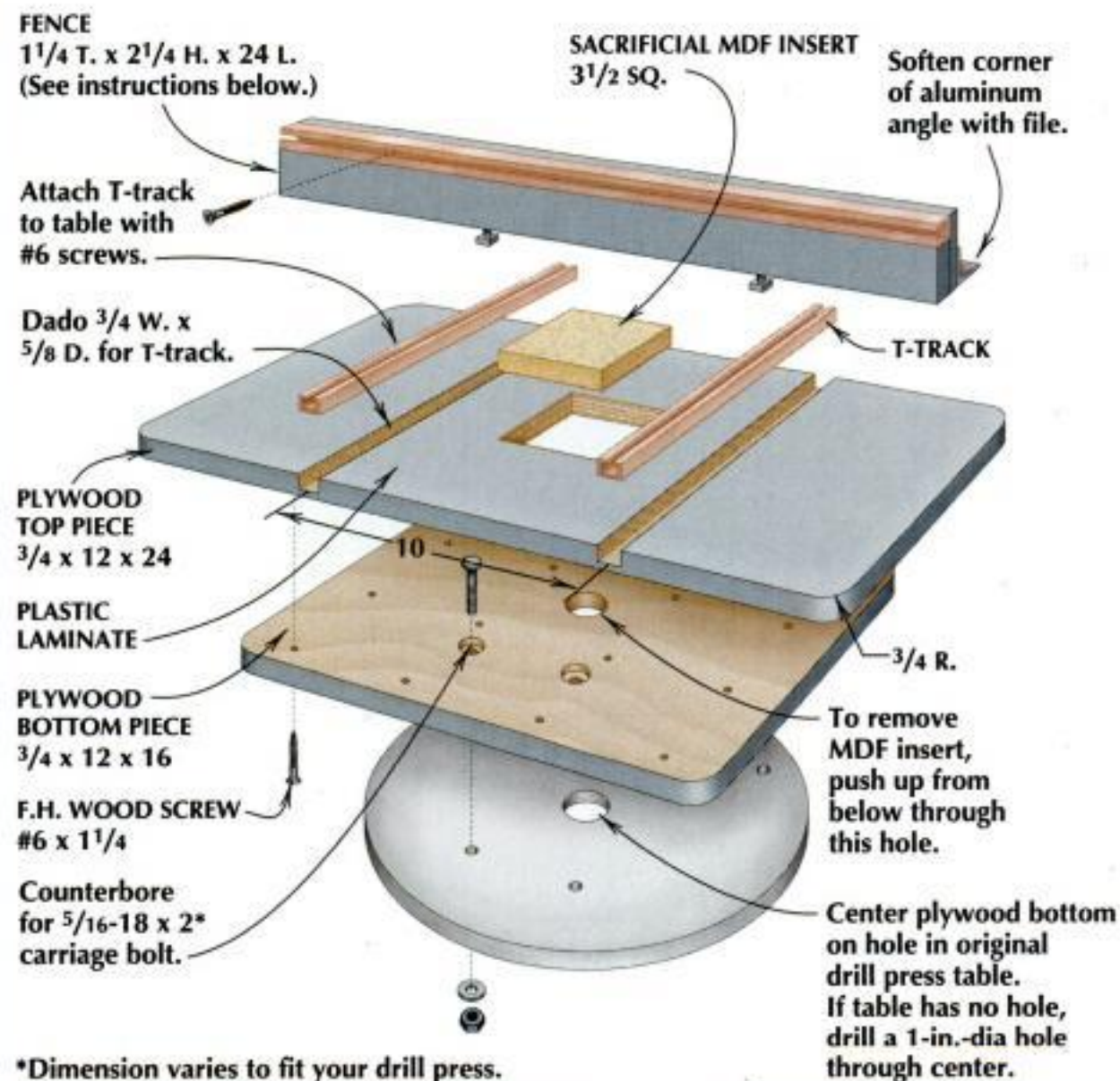
*restores antiques and builds period reproductions in his Pennsylvania shop.*



# MAKING THE TABLE

## TABLE CONSTRUCTION

I chose 3/4-in.-thick Baltic birch plywood for the table components because of its stability. Plastic laminate on the tabletop and on the fence increases durability. You can write project notes on the laminate and wash them off when you're done.



The drawing at left gives dimensions for the table parts. The steps below will guide you through construction.

## CONSTRUCTION SEQUENCE

**Step 1:** Cut the plywood top and bottom pieces to width and length, and round the corners. Mark a centerline from front to back on both pieces.

**Step 2:** Center the bottom piece against your drill press post. Then drill a 1-in.-dia. hole through its center.

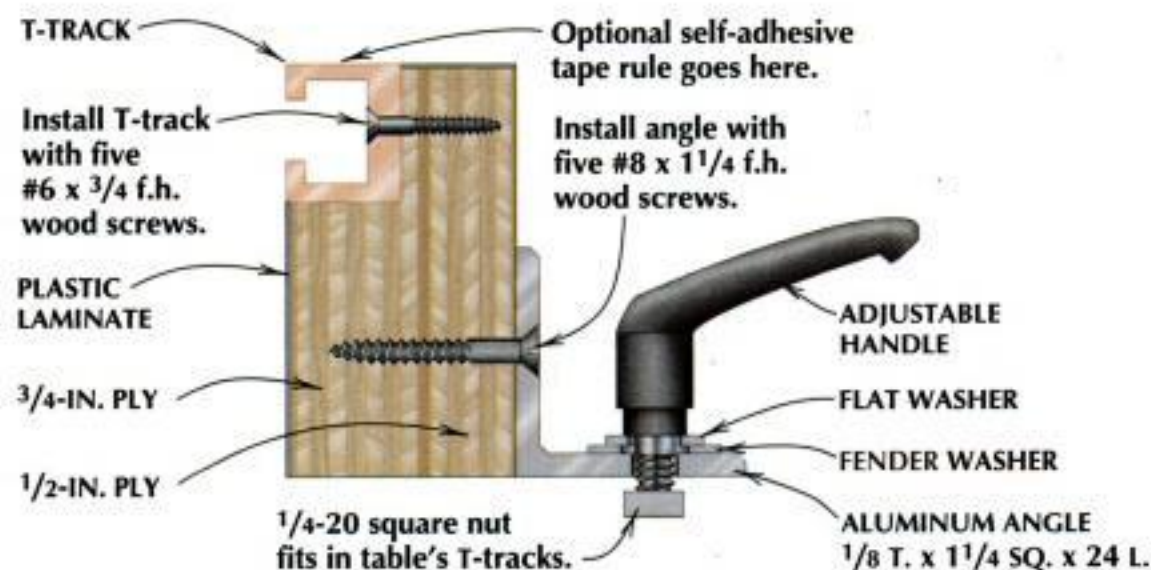
**Step 3:** Mark the locations on the bottom piece for the carriage bolts that will hold the new table to the old one. Drill these holes. Also, lay out and drill for the screws that hold the bottom piece to the top, making sure to account for T-track location.

**Step 4:** Now turn to the top piece. Cut the square opening to hold the sacrificial MDF insert. This opening is centered on the hole in the bottom piece. I used a saber saw and cleaned up the cut with files.

# MAKING THE FENCE

## FENCE CONSTRUCTION

The square nuts on the fence fit into the mating T-tracks on the table. Two adjustable handles tighten to hold the fence in place. A T-track on the face of the fence holds various stops and jigs. (See opposite page.)



## CONSTRUCTION SEQUENCE

**Step 1:** Glue up the plywood for the fence body, as shown at left. Then cut it to width and length.

**Step 2:** Glue plastic laminate to the top and front face of the block, and trim it with a flush-trim router bit.

**Step 3:** Cut a rabbet with a tablesaw or router, and install the T-track as you did for the table.

**Step 4:** Paint the exposed plywood on the fence and the table. At this point, I attached a self-adhesive tape rule to my fence to help position jigs accurately.



## JIGS AND ACCESSORIES

**M**y personal favorites are shown below and on page 69, but the possibilities are endless. The bases are made of plywood painted to match the fence. Specialty hardware and product numbers are noted below. You can order these and other specialized items from Hartville Tool Co. (800-345-2396, *Circle #601*); Woodcraft Supply Corp. (800-225-1153, *Circle #602*); and Reid Tool Supply Co. (800-253-0421, *Circle #603*).  
—C.W.B.

**Step 5:** Glue plastic laminate to the top. Trim the edges and the center opening with a flush-trim bit in a router or laminate trimmer.

**Step 6:** Cut the T-track dadoes in the top. You can use a carbide-tipped dado head on the tablesaw, or a router and a carbide-tipped straight bit.

**Step 7:** Drop the carriage bolts into their holes in the bottom piece. Then screw the bottom piece to the top piece, to form a single unit. Now mount your new table on the old one. (See drawing, left.)

**Step 8:** Install the T-tracks in the tabletop. Drill and countersink the tracks for #6 screws, and screw each track into its dado.

**Step 5:** Cut the aluminum angle to length, drill the holes for the handle bolts and attachment screws, and install the angle and handles on the fence as shown in the drawing. It's a good idea to radius or "soften" the bottom corners of the angle with a file or emery paper before installation, so they don't catch on your fingers. (See Table Construction, opposite page.)

Some aluminum angle isn't exactly 90°. Check to see if your fence locks square to the table. If it doesn't, file the angle square, or fit shims between the angle and the fence to correct the problem.



**Aluminum hold-downs.** These adjust to fit different material thicknesses. You can use them vertically, as shown here, or horizontally.

**Hold-downs (60736) and T-track from Hartville Tool**

**Cushioned hold-down.** Bolted to a plywood base, this toggle clamp has a swiveling neoprene pad for holding fragile parts firmly at any angle.

**Clamp (TC-227-U; 1/4-20) and pad (TC-207209) from Reid Tool**

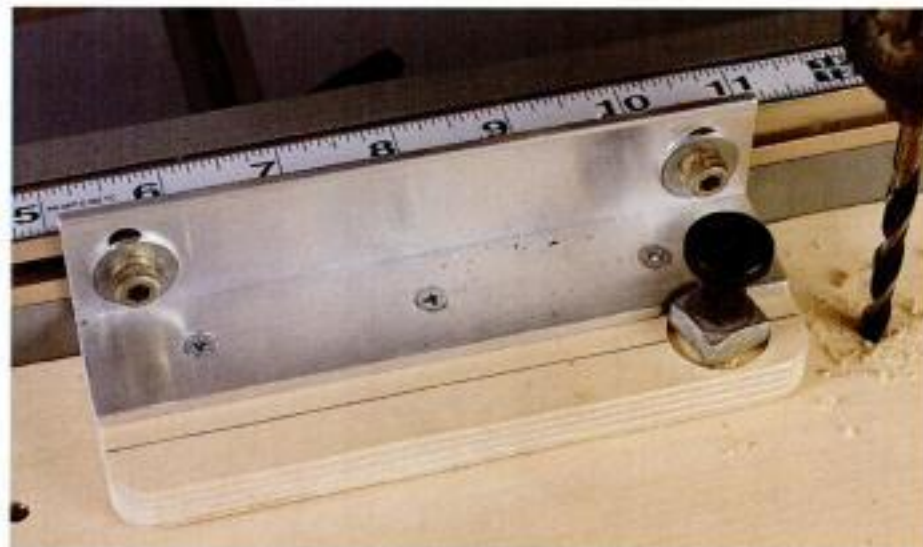


**Stop block.** This comes in handy for drilling identical parts. Scribe a line on the stop block's Plexiglas sight glass so you can take precise readings off the tape rule.

**Knob (DK-81) from Reid Tool; self-adhesive rule (08Y41) from Woodcraft Supply**

**Indexing shelf-drilling jig.** Aluminum angle and Allen screws lock the jig to the fence. Pull up on the spring-loaded knob to disengage a pin from the previously drilled hole.

**Knob (PRT-13) from Reid Tool**

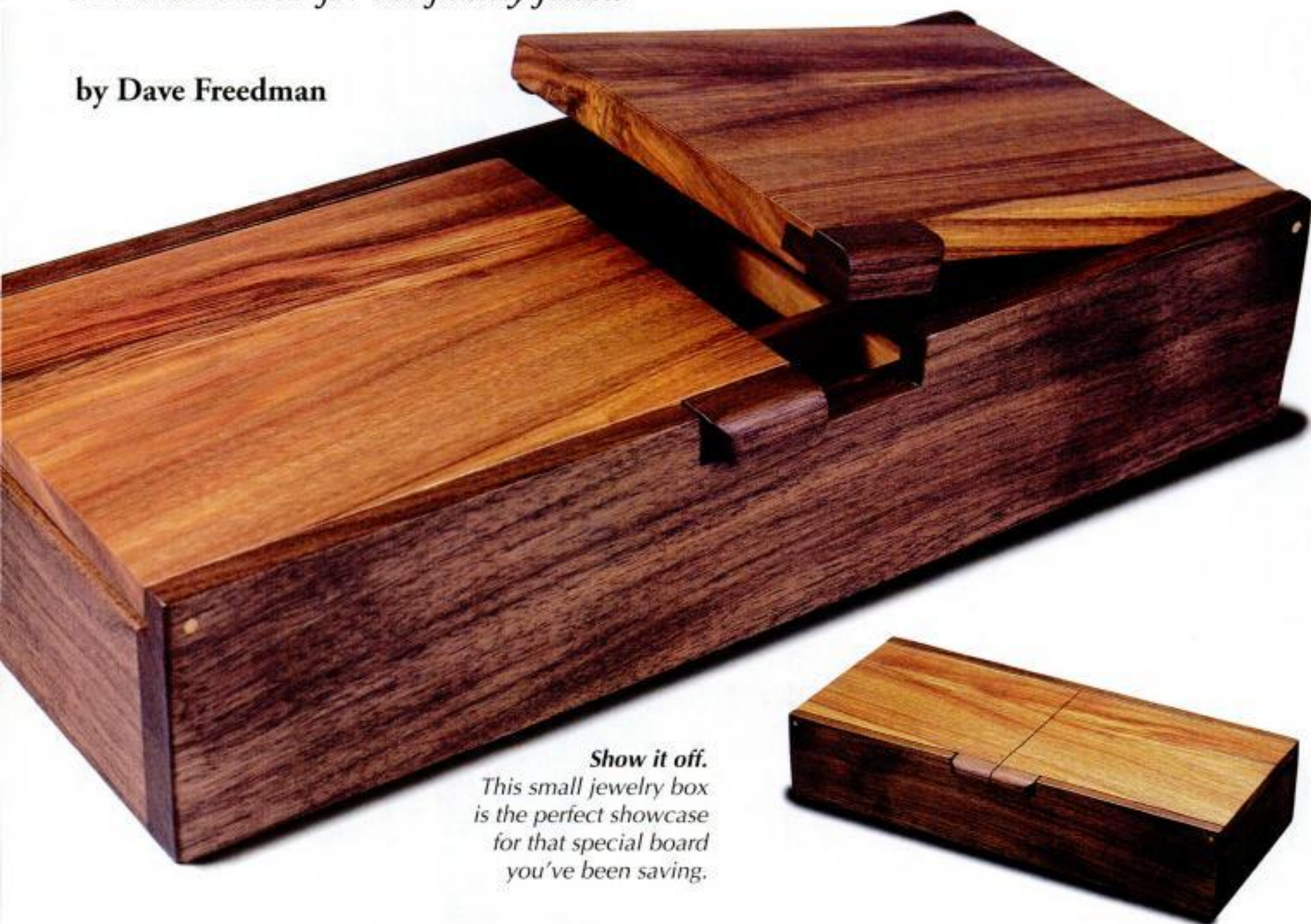




# JEWELRY BOX

*A treasure chest for the family jewels*

by Dave Freedman



*Show it off.  
This small jewelry box  
is the perfect showcase  
for that special board  
you've been saving.*

**M**aking a small box is a great exercise in small-scale joinery, and it lets you use scraps of precious wood. Plus, a small box makes a great gift in a hurry.

I designed this jewelry box to showcase a stunning piece of 1/2-in.-thick canarywood. The board was just under 5 in. wide. I decided to cut it into lids for a run of six jewelry boxes.

The streaky colors and wavy grain pattern were so beautiful that I wanted to make each lid as long as possible, but a long, unsupported lid is likely to bow or twist. I decided to crosscut each lid into two sections hinged at opposite ends, so that the grain pattern would still be continuous. A tall center divider inside the box splits the interior in half.

I chose walnut for the box itself, but this design can play up any of your favorite hardwoods.

## Building the Box

I used spline-reinforced butt joints to join the front and back of the box to the ends. The splines strengthen the joints and help maintain good alignment while clamping. The 1/8-in.-

wide by 5/32-in.-deep grooves for the splines can be cut all the way through, as shown in Fig. 1, because they'll be hidden by the lids and by the felt discs that you apply on the bottom after final assembly.

The cutout in the front of the box accommodates the handles. Make the cutout before assembling the box. If you form the cutout on the tablesaw, use a high-quality stacked dado set and a backup board to prevent tearout.

Once you've assembled the box, drill a hole in each corner for the pin hinges. For accuracy, lay out and mark the hole locations with an awl and use a brad-point bit in the drill press to drill the holes perpendicular to the sides of the box.

## Preparing the Lid Blank

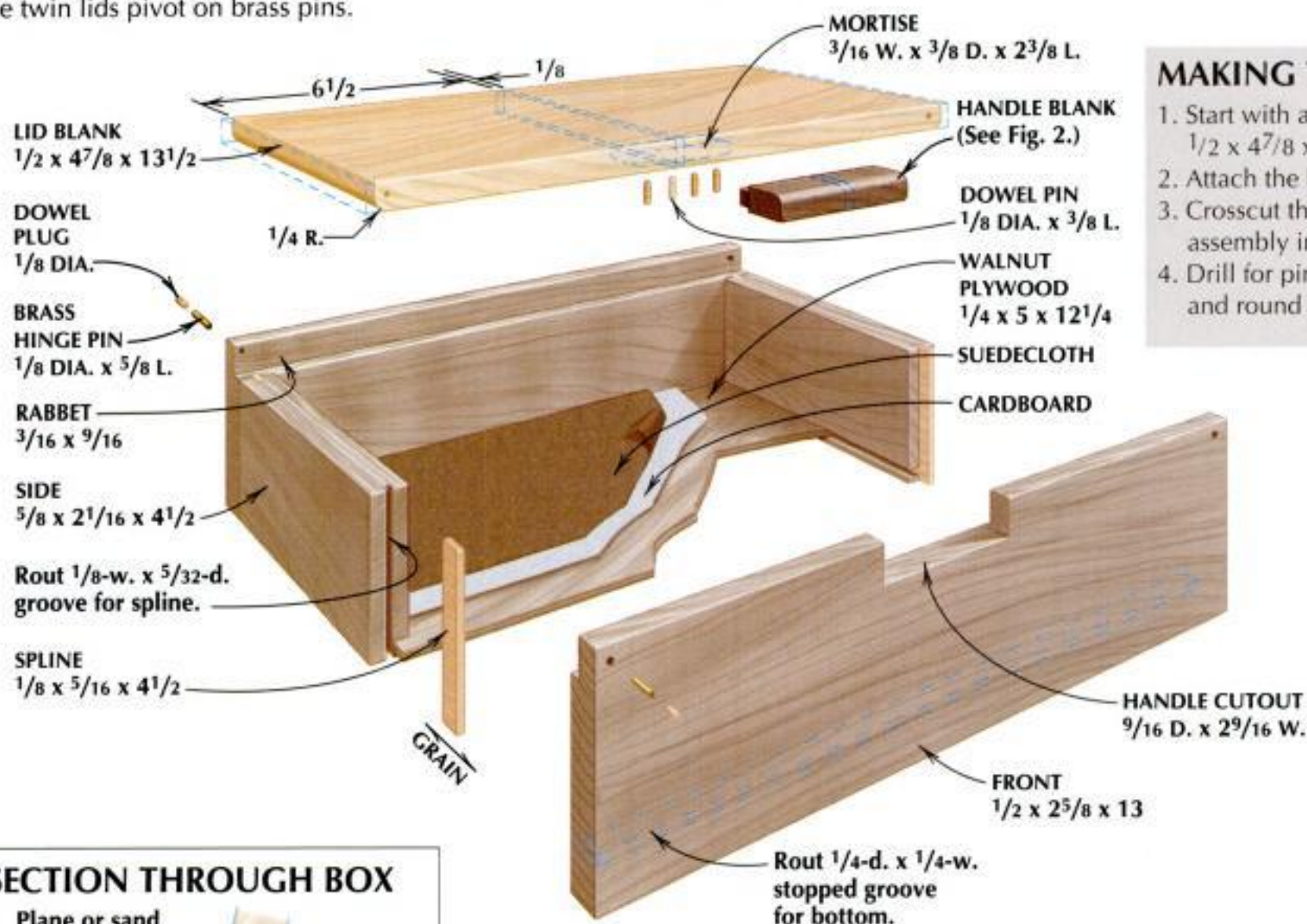
Cut the lid blank about 1/2 in. longer than the box, and wide enough to fit snugly between the rabbets in the front and back. You'll trim the length and adjust the width later.

Cut the mortise in the lid blank on the router table using a 1/8-in. straight bit. Set bit height to 3/8 in., and position the



## FIG. 1: TWIN-LID BOX

The lid design makes the most of a single beautiful board. Splined butt joints hold the front and back of the box to the sides. The twin lids pivot on brass pins.

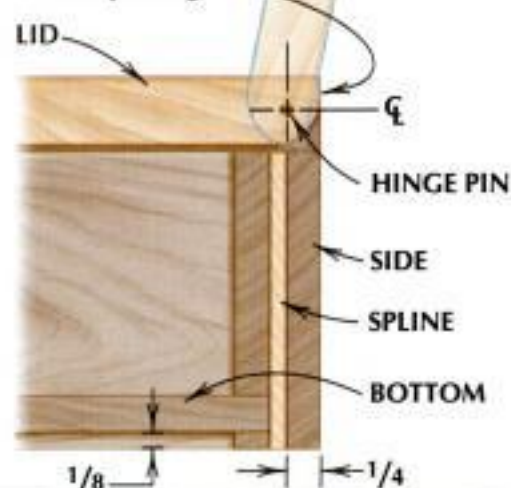


### MAKING THE LIDS

1. Start with a single blank 1/2 x 47/8 x 13 1/2.
2. Attach the handle blank.
3. Crosscut the lid and handle assembly into halves.
4. Drill for pin hinges, then cut and round the ends.

### SECTION THROUGH BOX

Plane or sand here if necessary to increase angle of lid opening.



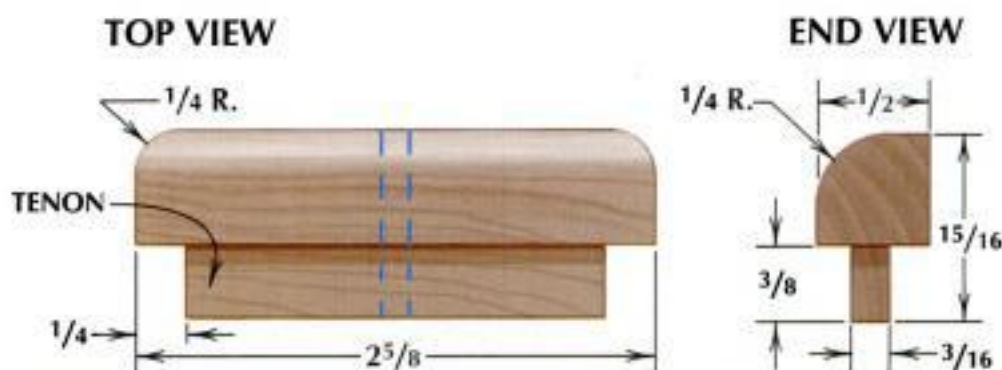
fence so that the lid's edge is approximately centered over the bit. Clamp stops to the fence for a 2-in.-long mortise, and flip the blank end-for-end between passes to center the mortise. Adjust the fence as necessary to rout the mortise to its finished width of 3/16 in. Then set the lid blank aside and make the handle blank.

### Making the Handle Blank

To make the handles for the box, start with a 1/2-in. by 1 5/16-in. by 2 5/8-in. blank of the same wood species used in the box. With a straight bit set at 3/8 in. high, form a centered tenon on the blank by making repeated shallow passes

## FIG. 2: HANDLE BLANK

Make the blank shown here and attach it to the lid blank. Crosscut the lid and handle assembly to create two individual lids with matching handles.



with the stock held vertically against the fence. To make this cut safely, I clamp a zero-clearance auxiliary table and a zero-clearance auxiliary fence to my router table. A push stick helps to keep fingers away from the bit as you push the stock. (See center photo, next page.) Flip the blank end-for-end after each pass, adjusting the fence until one corner of the tenon fits snugly in the lid mortise.

Next, trim the tenon to form the shoulders by holding the blank at 90° to the fence. On such a narrow workpiece, you risk kickback because the piece can tip into the bit. Play it safe and use a backup block to provide more surface

area against the fence when making this cut. (See left photo, next page.)

It's not necessary to square the mortise to fit the shoulders of the tenon. The shoulders will conceal the round ends of the mortise when the blank is installed.

I used a 1/4-in. round-over bit to round over the top front edge and the front corners of the handle blank. (See Fig. 2.) Again, use a backup block to make these cuts safely.

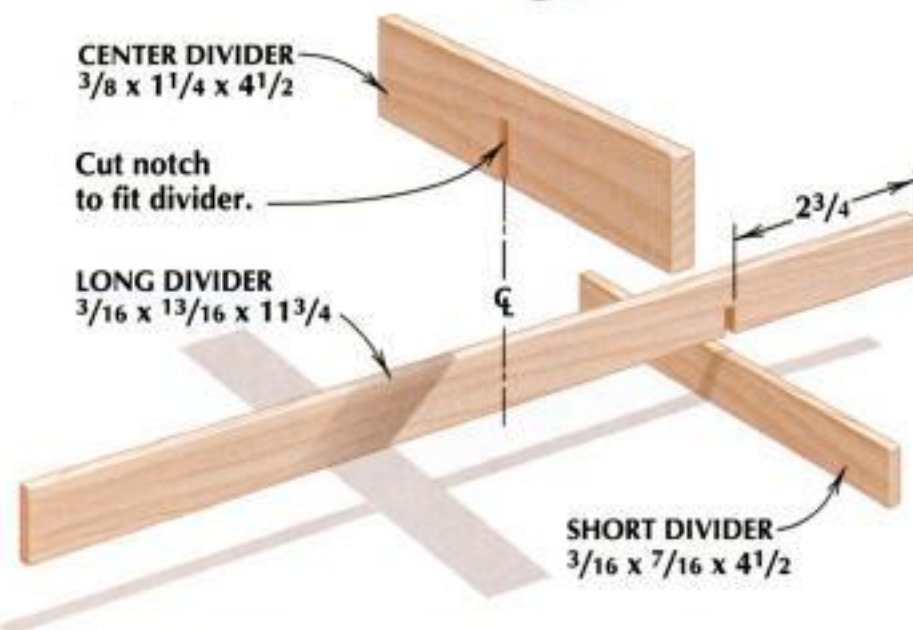
### Attaching the Handle Blank

Once you've shaped the handle blank and cut its tenon, attach it to the mortise in the lid. I didn't bother using



## FIG. 3: "SIX-POINT" DIVIDERS

The ends of the dividers provide six points of contact inside the box to keep them from shifting once they're installed. Notch and glue the three dividers together, then install them in the box without glue.



glue—canarywood is oily and doesn't glue well with yellow or white glue. I simply pinned the handle with four  $\frac{1}{8}$ -in.-dia. dowel pins in the lid's underside, about  $\frac{3}{8}$  in. deep. (See Fig. 1.) Put a dab of glue on the pins before tapping them into the holes so they adhere to the handle's tenon.

Before you crosscut the lid blank into two pieces, hand plane the back edge to allow clearance for opening and closing and to allow for expansion. A total gap

of about  $\frac{1}{16}$  in. is sufficient.

Now you can cut the lid in two. Line up the cut so that it bisects the handle blank, and sand the sawn edges smooth.

### Installing the Hinges

To prepare for the pin hinges, apply  $\frac{1}{16}$ -in.-thick felt discs to the underside corners of the lids—eight discs in all. Now center the lids on the box. Use a piece of paper to separate the lid halves, and insert paper or card stock between

the outer ends of the handles and the ends of the cutouts. Once the lids are centered, tape them firmly to the box.

Drill the  $\frac{1}{8}$ -in.-dia. pinholes  $\frac{3}{8}$  in. deep into the lids' edges, guiding the bit in the existing pinholes. Tap four  $\frac{1}{8}$ -in.-dia. by 1-in.-long brass pins all the way into the holes. The pins should stick out far enough so you can yank them back out with a pair of pliers.

With the pins in place, mark along the underside of the overhanging ends of the lids. Then remove the pins and tape and trim each lid to the marked line. Round over the bottom outside edge with a  $\frac{1}{4}$ -in. round-over bit. (See Fig. 1.)

Reassemble the lids on the box with the oversized pins and test to see if they open without binding. The lids should stop about  $20^\circ$  past vertical. If they won't open quite that far, remove the lids and use a hand plane or a sanding block to lightly chamfer the ends. (See Fig. 1.)

When the hinge mechanism operates smoothly, take everything apart, remove the felt discs, and apply finish.

### Final Touches

Once the finish has cured, reassemble the box and install  $\frac{5}{8}$ -in.-long brass pins. Each pin head should sit about  $\frac{1}{8}$  in. below the surface. Glue  $\frac{1}{8}$ -in. dowel plugs into the holes, but before the glue sets, open and shut the lids to make sure the plugs don't restrict lid movement. Trim the plugs flush with a sharp chisel and dab some finish on their ends.

My jewelry box is lined in suedecloth, available at fabric stores. I used spray adhesive to attach the cloth to a piece of cardboard that fit the inside dimensions of the box. Then I pressed the cardboard and cloth in place.

I furnished my box with removable cherry dividers. You can devise your own divider configuration, but it's important to have at least six points of contact where the ends of the dividers touch the box's sides. This way, the dividers won't shift out of position. (See Fig. 3.)

Last, reapply two felt discs under each lid, near the box's center, and apply felt discs to the bottom corners of the box. ▲

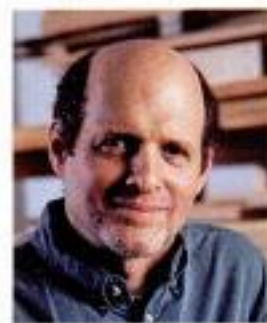
## ROUTING SMALL PARTS SAFELY



**Close the gap.** Prevent small pieces from dipping into the cutter by using an auxiliary table and fence. Use a backup block to guide narrow pieces.



**Push stick and featherboard.** Keep fingers clear of the bit with a shop-made push stick. A featherboard directs sideways pressure on the workpiece.



**DAVE FREEDMAN**  
is an associate editor  
of AW.

PHOTOS BY ANDY RAE



# SHOP assembly table

*This multi-purpose workstation will transform the way you work*

**Y**ou've dimensioned your stock, cut and test-fitted the joints, and now you're ready for assembly. One slip at this stage, and you might have to backtrack to the lumber pile and start over. Here's where an assembly table can help.

From rough layout and lumber selection to final finishing, a well-designed assembly table is more valuable and versatile than its name suggests. And ours represents the best of the breed, incorporating helpful, innovative features that we found at the top of many woodworkers' wish lists.

A good assembly table should meet several important criteria: First, the top of the table should be flat. Working on a less-than-flat surface can result in twisted or out-of-square assemblies. And essential tools and supplies—fasteners, glue, clamps, squares and measuring tools—should be at your fingertips, so you don't find yourself running across the shop during glue-up looking for that lost mallet.

**Assembling in style.** This mobile work table is rock-solid, offers plenty of storage to keep clamps and supplies within easy reach, and provides electrical power for tools.





## SPECIALIZED STORAGE FEATURES



**Tilt-out clamp storage.** The tilt-out drawers pivot open and stop, making it easy to get to your stash of pipe clamps. (See page 81.)



**Slide-out access.** The pull-out drawer behind the door lets you quickly get to supplies and accessories. A receptacle inside keeps spare batteries ready to go.



**Fastener drawers.** Three small drawers fitted with plastic food containers organize assembly hardware and provide convenient access.



**Deep storage drawers.** Two tall drawers hold stacks of quick clamps or power tools such as routers, sanders and hand-held planers.

Height is an important factor, too. The standard workbench height of 32 in. to 36 in. is too high for most assembly work—you'd be on tiptoe trying to clamp up a cabinet or chair.

We took these considerations into account when we designed our assembly table. At 27 in. high, the table top is a comfortable height for working on a chest of drawers, brushing on a finish or nailing together a cabinet. And the top is made dead flat by support from a rigid cabinet and base structure underneath. The top overhangs the cabinet

by 3 in. on all four sides, making it easy for clamps to get a grip.

The cabinet itself is equipped with storage features that will keep all your tools and gear within easy reach. (See photos, above.)

One thing you won't find here is a tangle of extension cords at your feet. Our assembly table offers plenty of receptacles to plug in your power tools—20 in all. There's even an outlet box inside the cabinet to power battery chargers for cordless power tools. (See sidebar, page 78.)

A set of wheels and casters under the cabinet allows you to move the bench, yet locks to keep the table stationary during assembly. Read on to find out more about the features of this essential shop fixture, plus some notes on the trickier aspects of construction.

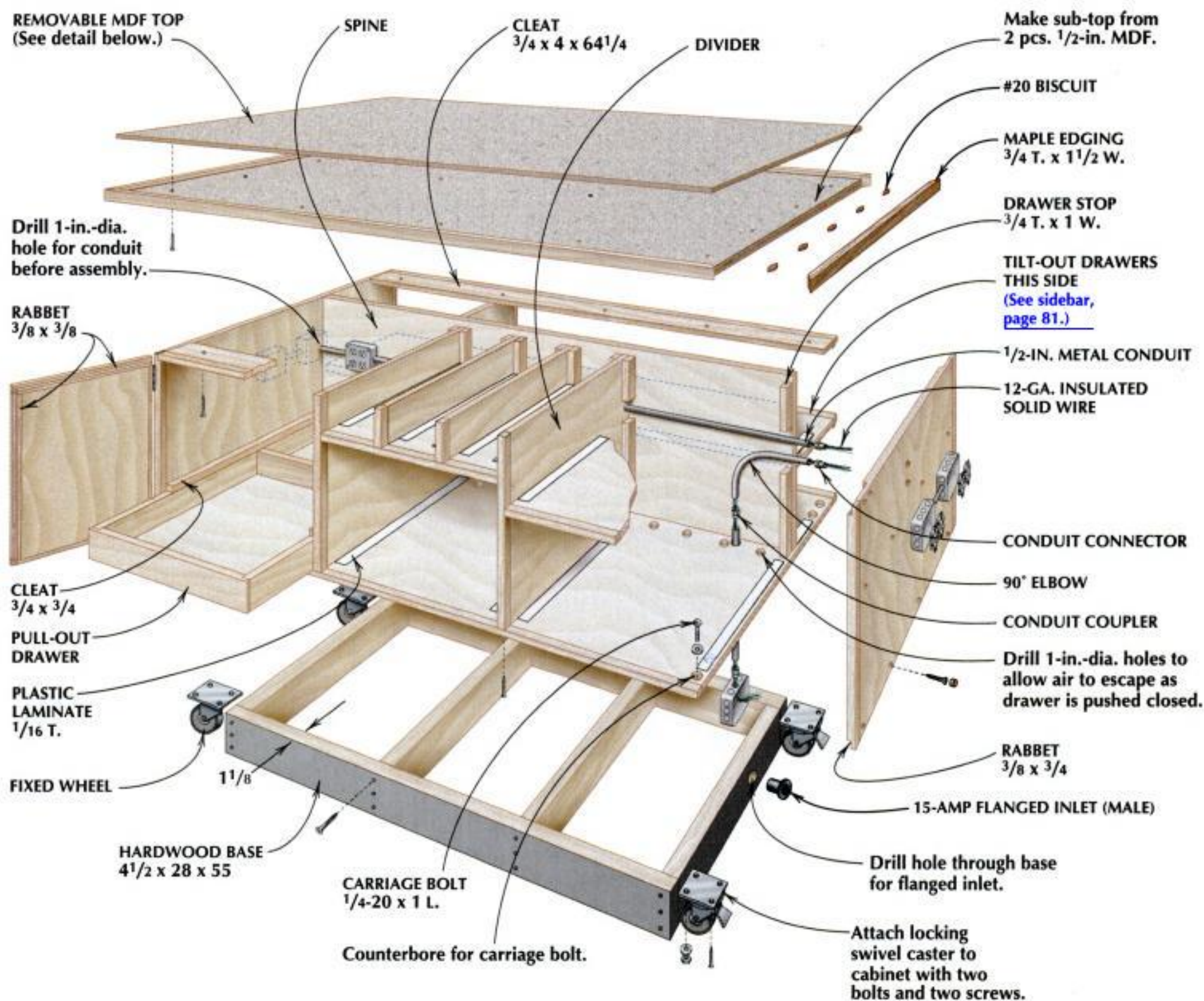
### Start with the Case

The plywood cabinet, with its interior plywood "spine," provides a rigid structure that stiffens the top. (See Figs. 1 and 2.) Before gluing and screwing the case parts together, glue solid wood edg-

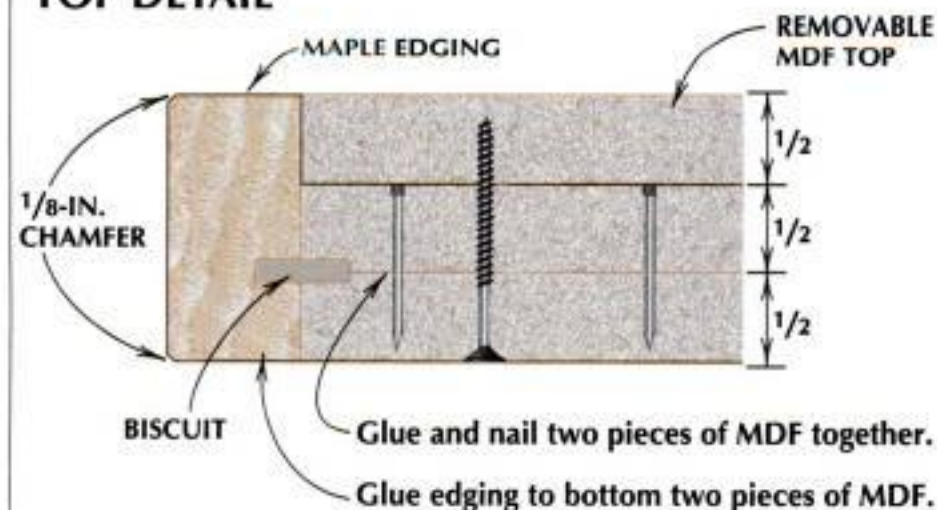


## FIG. 1: ASSEMBLY TABLE

This mobile work station consists of three assemblies: a solid-wood base with lockable casters, a two-sided plywood cabinet and an MDF top with hardwood edging. Plugging an extension cord into a single flanged inlet (located in the base) supplies power to five outlet boxes with a total of 20 individual 115V outlets. See Fig. 2 for dimensions.



### TOP DETAIL



### ORDERING SHEET GOODS

We recommend hardwood plywood for all of the assembly table's plywood parts. To build the table shown here, you'll need to order 4-ft. by 8-ft. sheets as shown below.

| Quantity | Thickness and type    |
|----------|-----------------------|
| 3 sheets | 3/4-in.-thick plywood |
| 1 sheet  | 1/2-in.-thick plywood |
| 3 sheets | 1/2-in.-thick MDF     |



# ELECTRIFYING YOUR TABLE

Who needs a tangle of electrical cords snaking its way around a work area? To avoid this problem, we designed our table with plenty of places to plug in for power.

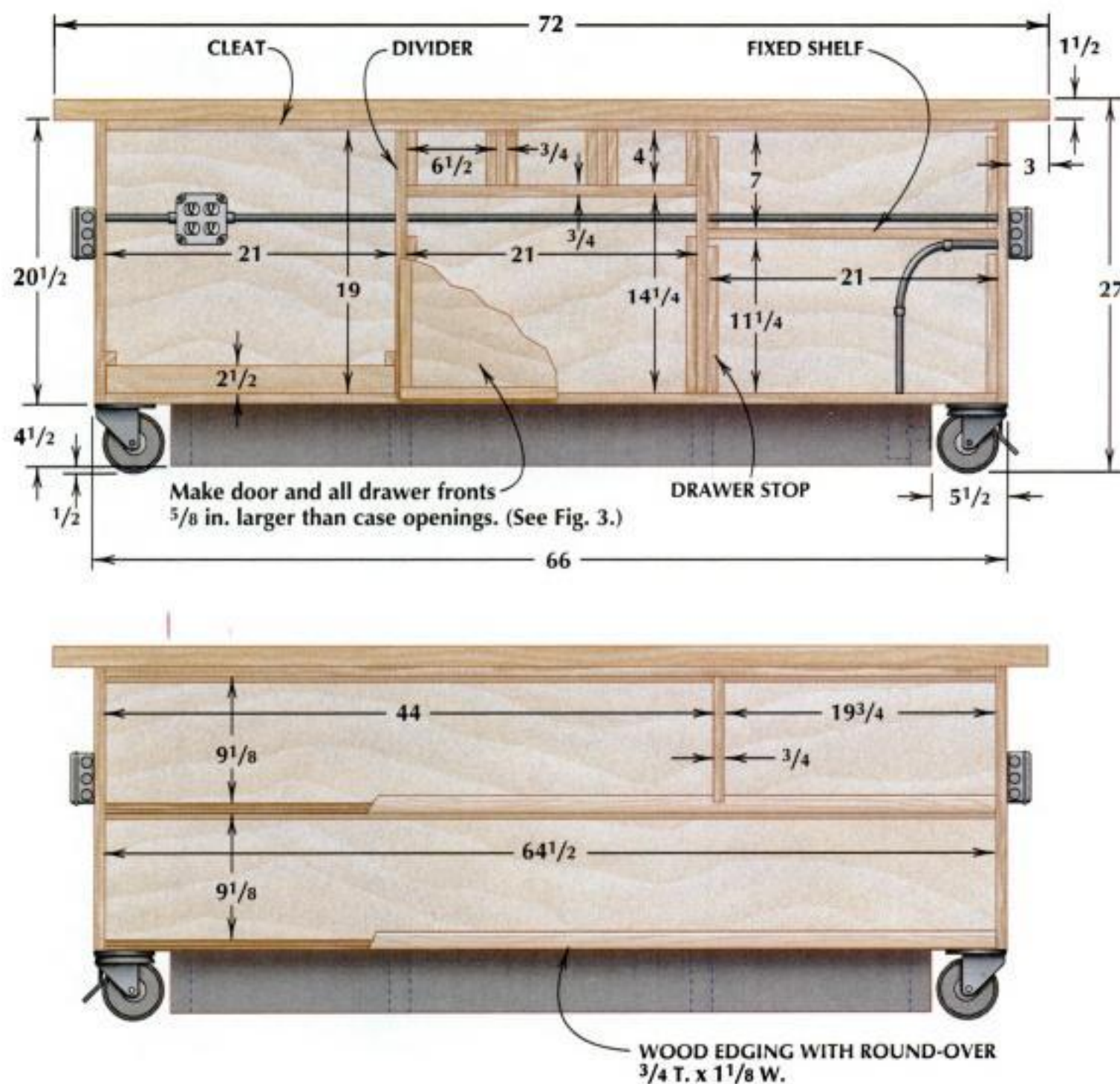
Inside the case is a surface-mounted, four-receptacle outlet box. On each end of the cabinet, there's a pair of four-receptacle outlet boxes. To run electrical wire to the boxes, we used 1/2-in.-i.d. metal conduit. (Available from home centers or electrical supply houses.) The metal conduit shields 12-gauge insulated solid wire that is connected to 15-amp duplex receptacles at each outlet box.

You'll need one 90° conduit elbow to run the wires from one of the outlets on the side of the cabinet to the male receptacle located in the base. (See Figs. 1 and 2.) The 15-amp male receptacle, known as a flanged inlet, is commonly used on RVs, and can be purchased at most electrical supply houses or from RV suppliers. To "power up" your table, simply plug a heavy-duty, 12-gauge extension cord (with a maximum length of 25 ft.) into the flanged inlet.



## FIG. 2: ASSEMBLY TABLE ELEVATIONS

Begin construction by edging the plywood case parts with strips of 3/4-in. by 3/4-in. solid wood. Then glue and screw the case parts together.



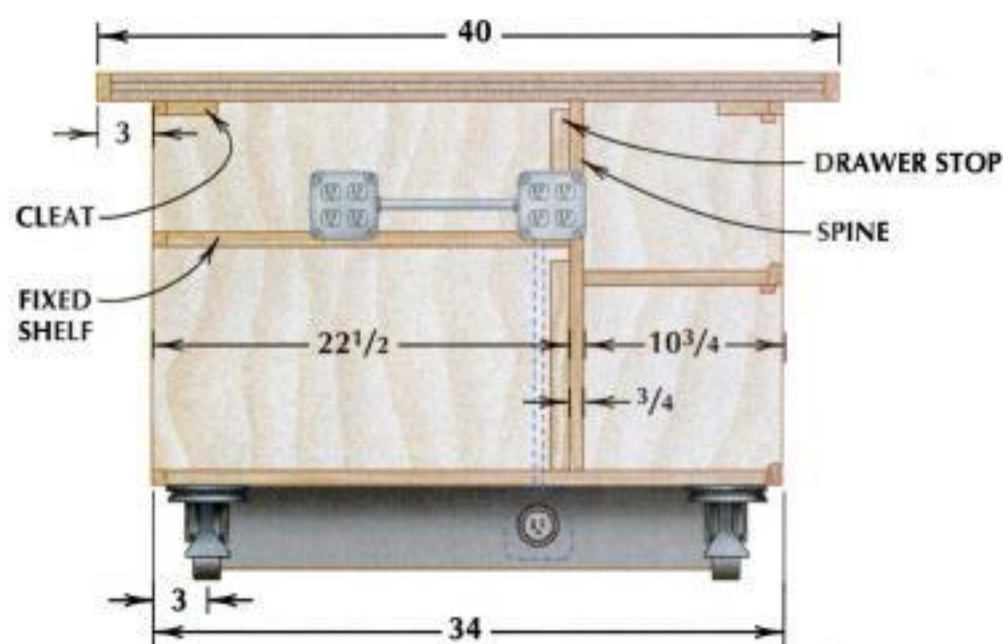


### Power on the go.

Plug an extension cord into this male receptacle to power the bench, then simply pull out the cord when you need to move the table.

### Power connection.

Metal conduit connects the power inlet in the base with surface-mounted receptacle boxes on the ends of the cabinet.



ing to all the exterior edges: sides, shelves, dividers, top cleats and bottom. You'll need to apply bullnosed edging to the shelves under the tilt-out drawers. (See Fig. 2.) Also, prior to assembly, drill 1-in.-dia. holes through the sides and the two dividers for the electrical conduit, and through the bottom so that air can escape when the two large drawers are pushed into the case.

Glue and screws are sufficient to hold the case parts together. During glue-up, check that the case is square by taking diagonal measurements from opposite cabinet corners. We plugged the screw holes on the case sides for good looks.

### The Base Adds Rigidity

The base is a simple ladder-type assembly of 1 1/8-in.-thick hardwood beams. Attached underneath the cabinet, the base stiffens the case and keeps the entire assembly table square and flat. We used maple for the beams, but other strong hardwoods like oak or birch will work equally well. Joint the six beams dead straight, rip them to width and screw them together. Then run a bead of glue along the top edge of the base and clamp it to the cabinet bottom.

If you decide to follow our wiring scheme (see sidebar above, opposite page), drill a hole through one of the end

pieces of the base for the male receptacle before screwing the base parts together. (See Fig. 1.)

### Wheels that Lock and Roll

Attaching wheels on the assembly table allows you to position the table where you want it. To keep the table solid as a rock when you're working on it, you should be able to fully lock the wheels. But most locking casters lock only the wheels, not the swiveling plate above them.

Our solution was to install special locking casters and matching fixed wheels, available from Lee Valley Tools (800-871-8158). The casters lock both wheel rotation and swivel action via a foot-actuated lever, so you won't accidentally move the table as you push against it. (See photo, left.)

Attach each wheel or caster with two carriage bolts, nuts and lock washers through the cabinet bottom and with two screws driven up into the cabinet side. (See Fig. 1.) Be sure to counter-sink the bolt heads below the cabinet surface so they don't interfere with drawer movement.

### Five Types of Drawers

We designed five types of drawers for the cabinet. Each type offers a specific storage function for assembly gear.

Let's look at the deep side of the cabinet first, where the three smallest drawers are located. Each of these small drawers is sized to hold six standard 2 1/2-in.-high by 3 1/4-in.-wide by 5 1/2-in.-long plastic containers made by Rubbermaid® (available at Wal-Mart or other superstores). Each container will hold at least a 100-count box of common screws or bolts. (See bottom left photo, page 76.) Edge all the door and drawer parts with solid wood, then rabbet and groove the appropriate edges before you assemble the drawers. (See Fig. 3.)

The two large bottom drawers in the cabinet are tall enough to accommodate routers or other large power tools, a stash of quick clamps, C-clamps, or your wooden handscrew collection. (See bottom right photo, page 76.) The wide top drawer is handy for layout and marking tools, sanding supplies and other small items. We used 3/4-in.-thick plywood for the fronts, backs and sides of these larger drawers.

A fourth type of drawer fits inside the case behind the door, and pulls out to provide quick access to its contents. (See

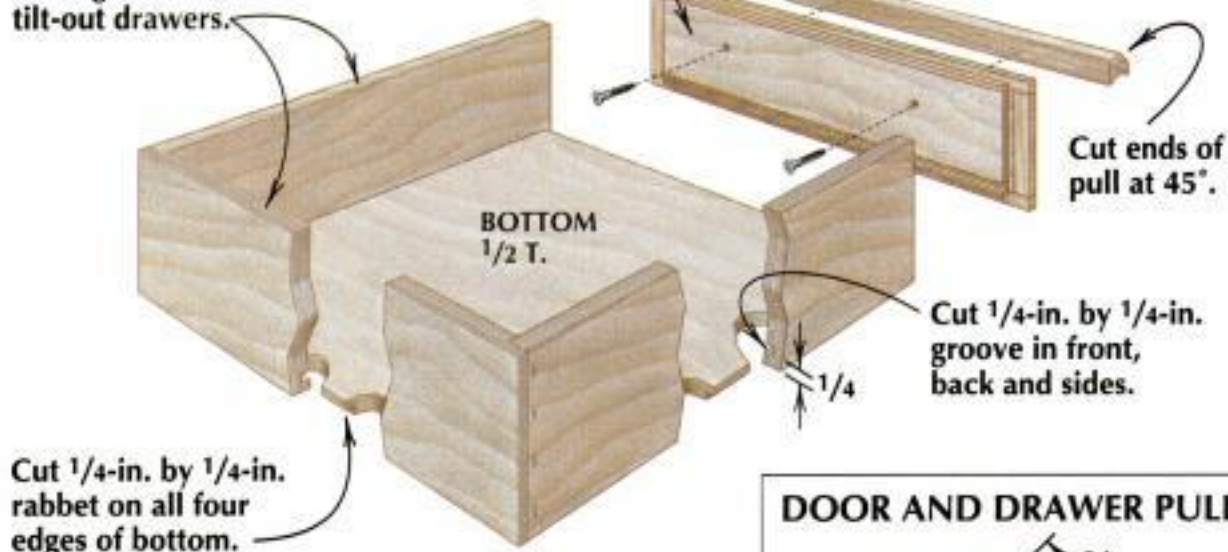


## FIG. 3: MAKING THE DRAWERS

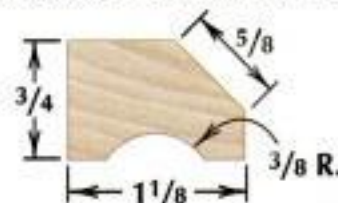
All the drawers are made from utility-grade birch plywood. Drawer fronts are edged in solid maple. Sides are glued and nailed in rabbets in the fronts and backs. Drawer bottoms are glued in grooves in the fronts, backs and sides.

### CONSTRUCTION OVERVIEW

Make sides and backs  $\frac{1}{2}$  in. thick on small drawers;  $\frac{3}{4}$  in. thick on large drawers and tilt-out drawers.



#### DOOR AND DRAWER PULL



### DRAWER FRONT CONSTRUCTION

All finished drawer fronts are  $\frac{5}{8}$  in. longer and wider than their cabinet openings.

**STEP 1:** Cut plywood blanks  $1\frac{1}{2}$  in. smaller in length and width than finished size of drawer front.



**STEP 2:** Edge blanks with solid wood.

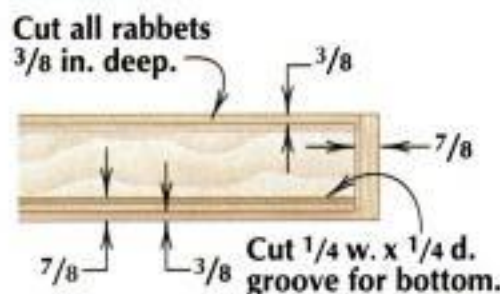


**STEP 3:** Rabbet and groove backs of drawer fronts. (See Rabbet Layout.)

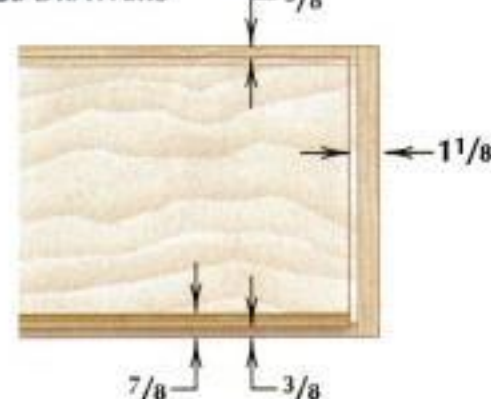


#### RABBET LAYOUT

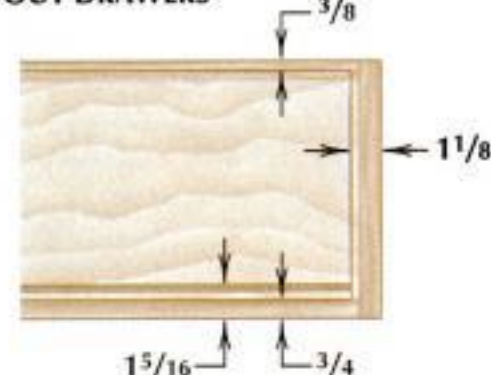
##### SMALL DRAWERS



##### LARGE DRAWERS



##### TILT-OUT DRAWERS



top right photo, page 76.) It is held in place by cleats screwed and glued to the sides of the cabinet opening. (See Fig. 1.) We loaded this pull-out drawer with cordless drills and glue supplies.

On the opposite side of the cabinet, three bin drawers, each a different length, store pipe clamps, quick clamps or other long or heavy items such as wooden cauls. These drawers tilt outward, stopping at a convenient angle to prevent the drawer or its contents from spilling. (See top left photo, page 76.) The drawers are simple to build, but careful layout is important to get the correct pivoting action. (See sidebar, opposite page.)

On both sides of the cabinet, strips of plastic laminate attached to the shelves with contact cement reduce friction and wear, helping the drawers to slide in and out smoothly.

#### A Three-Layer Top

The top is made from three layers of  $\frac{1}{2}$ -in.-thick medium-density fiberboard (MDF). This is the best choice in sheet goods because MDF is more stable than plywood or particleboard, so it will stay flatter. (For more on man-made panels, see AW #43.)

The two bottom layers of MDF are glued together and edged in solid wood. The third, top sheet is secured to the bottom assembly with screws from below. (See Fig. 1.) If it ever becomes chipped or damaged in use, you can replace the top by screwing on a fresh sheet.

We glued up the bottom layers by spreading glue on each sheet with a paint roller, then tacking the two pieces together with an air stapler. We edged the assembly with  $\frac{3}{4}$ -in. by  $1\frac{1}{2}$ -in. maple, using biscuits every 10 in. or so to align and strengthen the joints. To attach the top to the cabinet, drill and countersink holes in the top cleats, then center the top on the cabinet and screw it fast from below.

#### Finishing Details

To make the assembly table more user-friendly, we hand-planed small chamfers on the edges of the door and drawers with a block plane and broke sharp edges with sandpaper.

Finally, we gave the cabinet and top a couple coats of Deft brushing lacquer. Polyurethane will also keep the cabinet clean and prevent glue and other spills from sticking to the top. ▲



# TILT-OUT DRAWERS

When we were designing our assembly table, one of the AW editors hit upon a concept more often associated with bathrooms and dirty clothes. The idea was to have a drawer bin—much like a clothes bin—that would pivot outward and then stop at a convenient angle. Instead of laundry, we thought it would be great to store long or heavy items like clamps and cauls. After Design Shop veteran Fred Matlack mocked up a prototype to work out the bugs, we had what we wanted: A tilt-out drawer that pivoted on a bullnosed, wooden edge, then stopped open to allow easy access to the contents of the drawer.

The drawing below shows how the drawer works, along with the dimensions and necessary layout that allow each drawer to fit the case openings shown in Fig. 2. Mill the grooves and the rabbets in the plywood drawer parts first, then lay out the curves and notches on the drawer sides as shown and cut these parts out on the bandsaw.

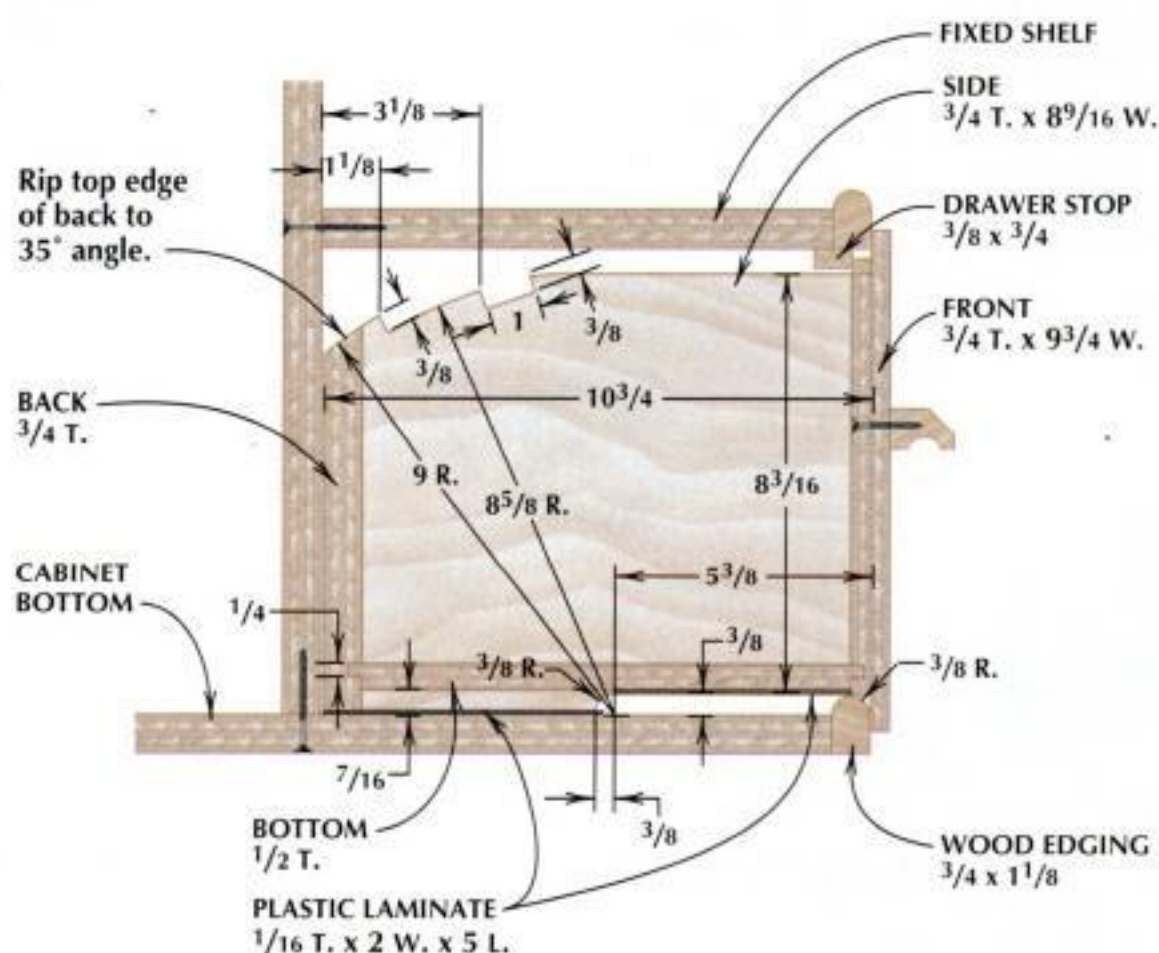
We assembled the drawers with glue and an air stapler, but finish nails will work if your shop isn't equipped with pneumatics. As on the other drawers in the assembly table, we used strips of plastic laminate to reduce friction and wear; but here we glued laminate to the front part of the underside of the drawer bottom as well as to the back portion of the fixed shelf.



**Tilt-out storage.** These drawers pivot out and stop, allowing you to quickly access assembly tools such as clamps.

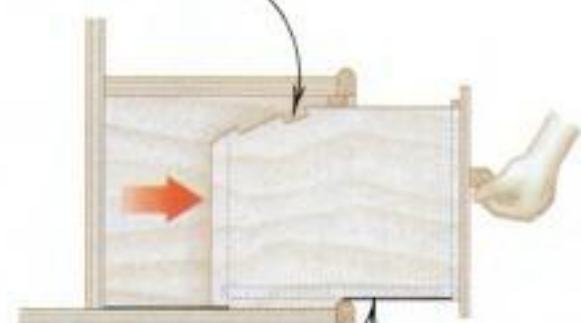
## TILT-OUT DRAWER

This type of drawer is ideal for storing heavy shop accessories such as pipe clamps because it's easy to operate even when fully loaded. The dimensions shown below allow the drawer to fit the case openings shown in Fig. 2. All three drawers for the assembly table are identical in depth and height, so laying out the drawer sides is identical for every drawer.



## HOW IT WORKS

Notch in drawer side permits installation and removal of drawer.



WOOD EDGING WITH 3/8-IN. ROUND-OVER

Plastic laminate on drawer bottom rides on wood edging.

Raised edge at back of drawer hits drawer stop, preventing drawer from falling out.



As drawer moves past center, it pivots over the wood edging and tips down.



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# Revolutionary Dust Collection

by David Lawton

I got tired of moving machines every time I needed to hook them up to my dust collector. Instead of giving up space and money for a system of pipes and blast gates, I designed a swiveling fixture that allows me to move a dust-collection hose to any machine in my shop, quickly and easily.

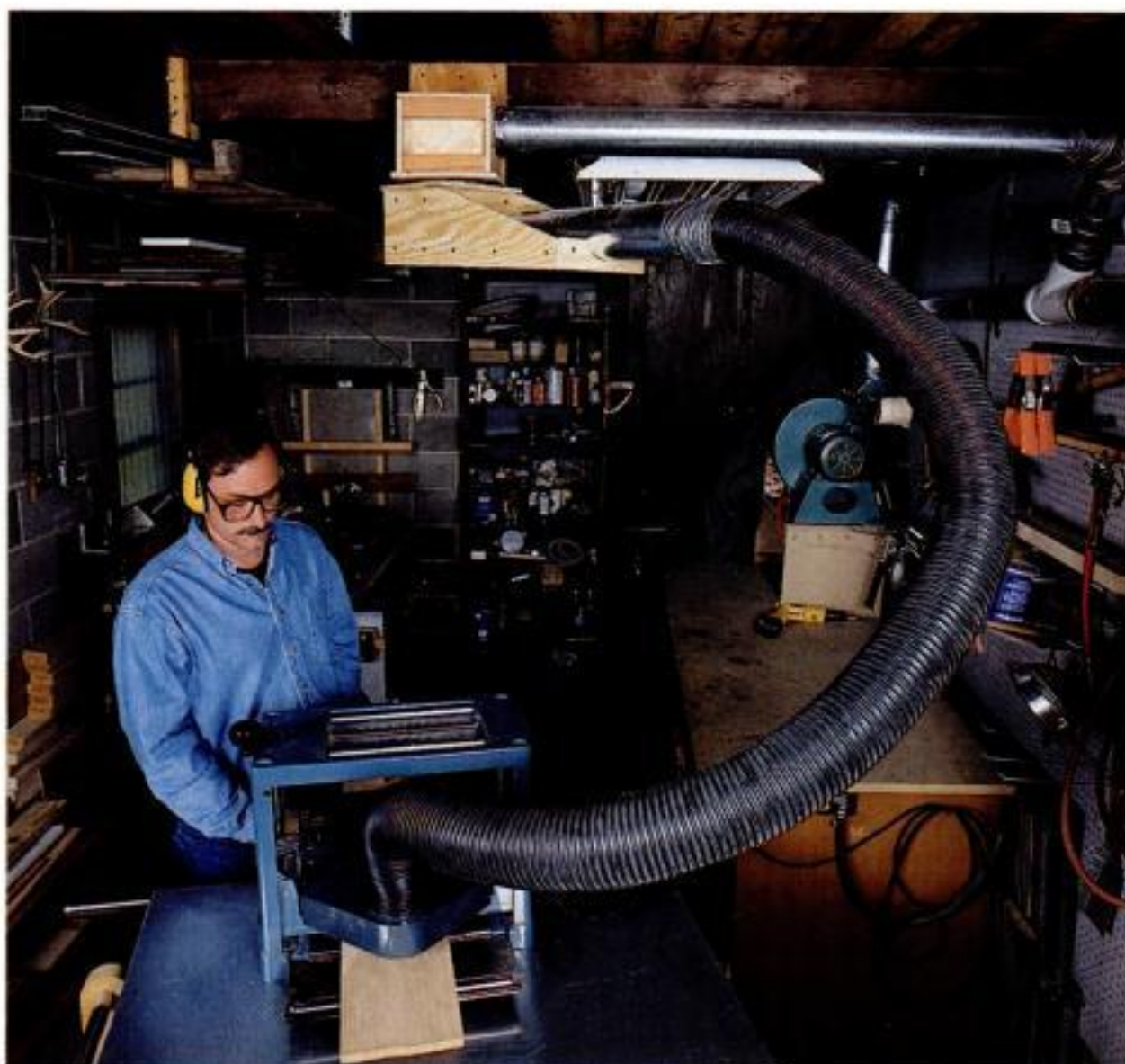
The fixture, mounted overhead and in the center of the shop, consists of two plywood boxes connected via a lazy susan bearing (available from Woodworker's Supply, 800-645-9292). The upper box is stationary and has a fixed, 4-in.-dia. pipe that runs from the box to a dust collector. The lower box swivels 360° on the lazy susan and holds a 4-in.-dia. by 24-in.-long pipe coupled to a length of flexible hose. Metal elbows inside the boxes are connected to each other and to the pipes outside the boxes. (See Figs. 1 and 2.) Metal pipe and elbows are available from hardware stores, home centers and mail-order suppliers.

I built this revolving junction box from 1/2-in.-thick plywood and scrap 2x material, screwing all the parts together. Before installing the faces where the pipe elbows protrude, screw each box to the lazy susan and install the elbows. To prevent chips and debris from clogging the pipes, make sure the upper elbow fits over the lower elbow. (See Fig. 2.) Position each face piece over the appropriate elbow, mark the hole for the elbow and cut the hole with a jigsaw or on the bandsaw. Then cap the elbows with the side pieces and connect the outside pipes to the elbows with duct tape.

Pick a central spot in your shop and screw or bolt the fixture to a beam or rafter. To put your new fixture to work, just rotate the lower box until the flexible hose is positioned over the machine you're about to use. You can devise your own system to fit the hose to specific machines or buy commercial fittings for 4-in. hose from woodworking mail-order catalogs. ▲

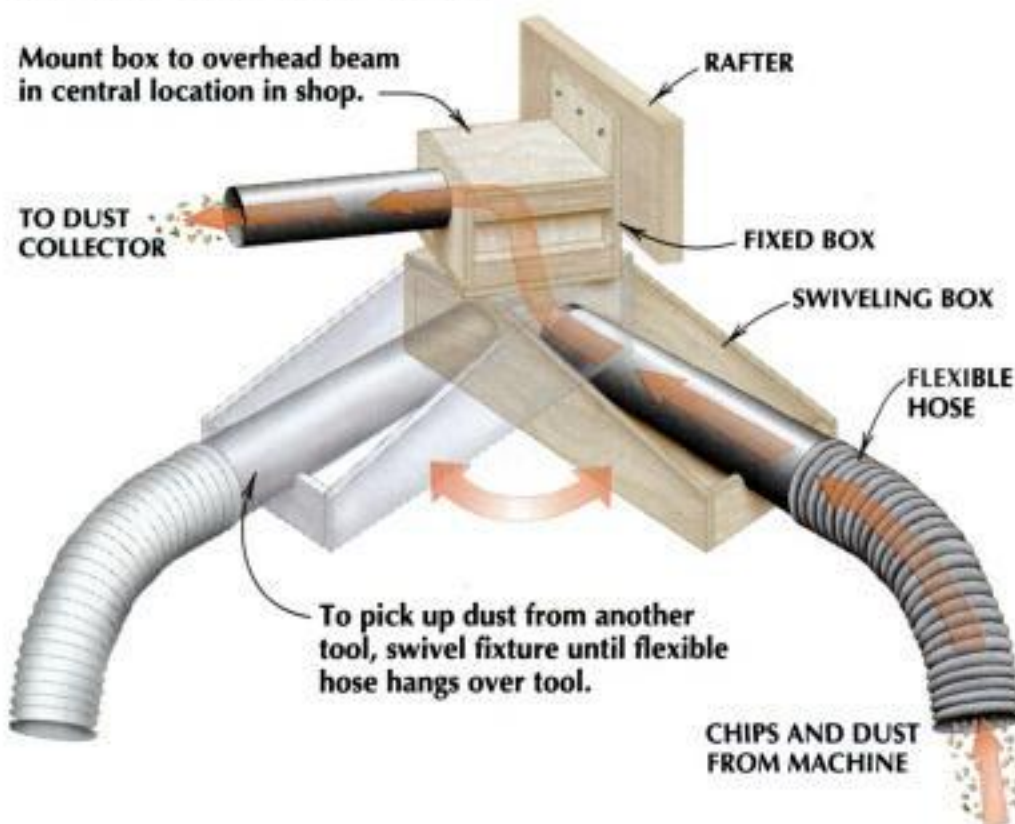
## DAVID LAWTON

is a part-time woodworker living in Delaware County, PA.



**360° flexibility.** Attached to a central ceiling joist, Lawton's dust-collection fixture rotates to put the hose just where it's needed.

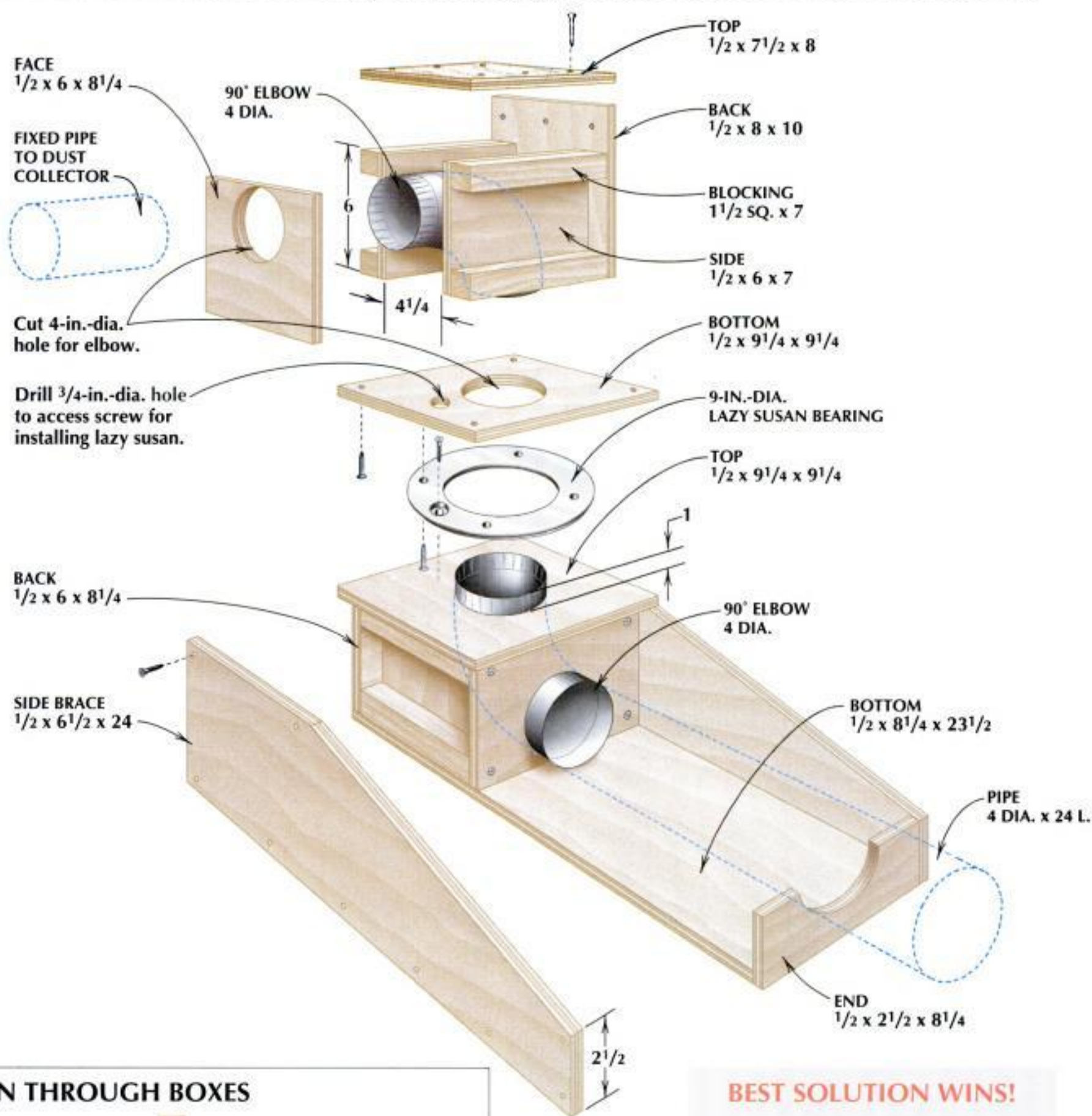
## FIG. 1: HOW IT WORKS



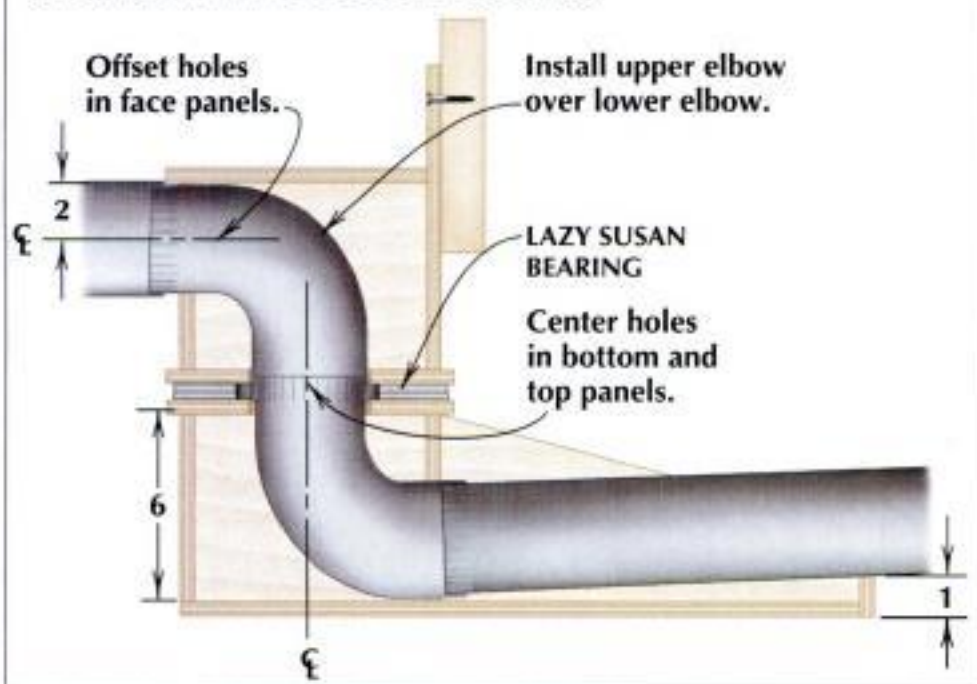


## FIG. 2: REVOLVING DUST-COLLECTION FIXTURE

The lazy susan hardware is the heart of this swiveling fixture, connecting the movable bottom section with the fixed top section.



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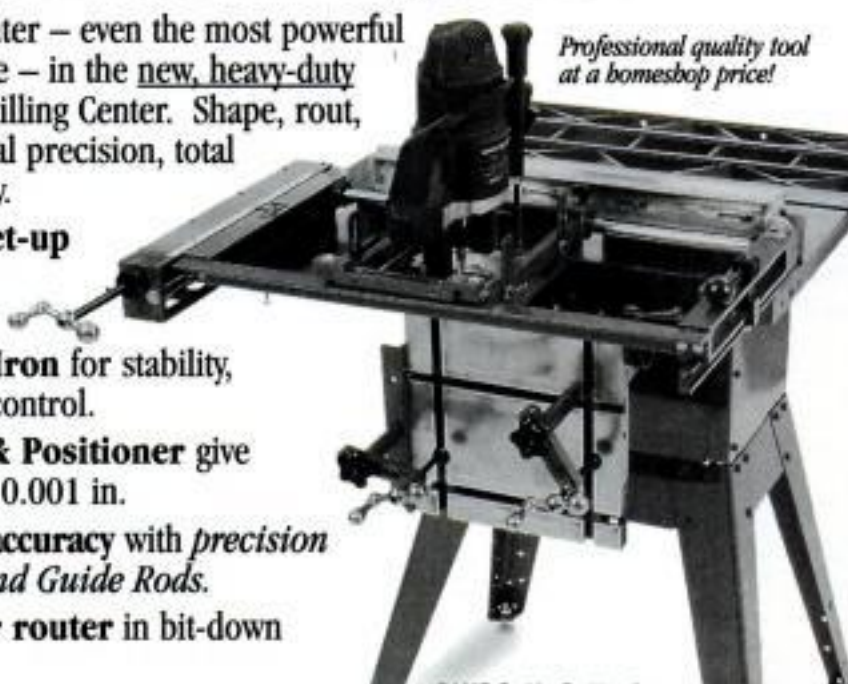
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# Teak

by Paul McClure



**T**eak has long been used in the Orient for both interior and exterior purposes. Centuries-old boats and houses made from the wood are still in use today.

When Dutch spice traders arrived in the East, they used teak to patch their sea-ravaged vessels. They were so impressed by the wood's resistance to saltwater and boring insects, they started teak plantations in Southeast Asia and India to supply the ship industry. Later they established plantations in Central America. Today, most of the world's teak supply comes from sustainable-yield plantations in these regions.

## Appearance

Teak heartwood is yellow-brown to dark brown with occasional chocolate-brown to black streaks. The yellow sapwood is removed in the country of origin. Some boards have white silica deposits in the pores; these are not considered a grading defect. Teak is coarse, with an oily feel.

The grain is normally straight but sometimes produces a fiddleback figure.

Teak furniture will keep its color and dark markings if used indoors. Exposure to the elements turns the wood a pleasing gray. Unfinished teak retains a scent similar to new leather.

## Workability

Teak can be worked with either hand or power tools, but the silica deposits can severely blunt cutting edges. I highly recommend carbide-tipped saw blades and router bits. Sometimes the tool's edge will give off a spark when it contacts silica. Teak turns and holds a profile very well. The wood will make moderate bends if steamed.

Freshly machined teak surfaces feel gummy because of a silica-based oil in the pores. This oil can inhibit glue adhesion. To improve bonding, use mechanical joints such as splines, tongue-and-groove, or mortise-and-

tenon. Also, wipe down the machined surfaces with lacquer thinner or acetone immediately prior to glue-up.

Teak holds fasteners very well, but preboring is a must to avoid splitting and to keep screws from breaking. During drilling, extract the bit often and remove the chips from the flutes. Otherwise they will pack with shavings, heating up and glazing the hole wall.

Use cabinet scrapers instead of sandpaper for surface preparation—the latter clogs easily. Teak takes a very high polish and accepts oil and lacquer finishes best. Some polyurethanes don't set up well on teak because of the oil in the pores.

## Uses

Teak is widely used for boatbuilding and for outdoor furniture. Indoors, it's used for furniture, cabinets and millwork, floors, carvings, and turnings. Teak also makes an excellent countertop in wet areas like the bathroom. ▲

## TEAK



Teak with cathedral grain

### SPECIES AND COMMON NAMES

*Tectonia grandis*—Genuine teak (African teak is in a different family, genus & species: *Euphoiaceae*, *Oldfieldia africana*)

### GROWING REGION

India, Burma, Thailand, Laos, Cambodia, Indonesia, Vietnam; introduced to Latin America

### SPECIFIC GRAVITY

0.57 to 0.63

### DENSITY

39 to 42 lbs. per cubic ft.

### WOOD MOVEMENT<sup>1</sup>

Tangential (flatsawn): small (less than 9/64 in. per ft.)

Radial (quartersawn): very small (less than 5/64 in. per ft.)

### DURABILITY

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### AVAILABILITY

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Veneer: plain sliced, \$1.60 per sq. ft.

<sup>1</sup>Indicates wood movement across the grain from 6% to 12% moisture content.





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CIRCLE NO. 50 ON PRODUCT INFORMATION FORM



# Brush Care

Save money while using the best

by Michael Dresdner

**B**ack in the late '60s, I did a good bit of hitchhiking. One day I was astonished when a gorgeous Rolls-Royce pulled over and picked me up. As I settled in and admired the French-polished locust-burl dashboard, I commented that this car must be expensive.

"Not really," replied my "ride." "It is the cheapest car I could buy."

"How do you figure?" I asked him.

"It's simple. I bought it 21 years ago for about \$19,000. It's still in perfect condition and I can no doubt drive it for another 20 years. Had I bought Cadillacs instead, I would be on my fifth, and none of the other four would have been worth very much. If I were to sell this car today, even accounting for inflation, it would fetch more than I paid for it. And my only expenses since I bought the car have been for gas, tires and routine maintenance. Do you understand?"

I did. The problem was, I did not have the initial chunk of dough needed to buy a Rolls. I still don't. However, I can afford great brushes.

## Good Brushes Are a Good Value

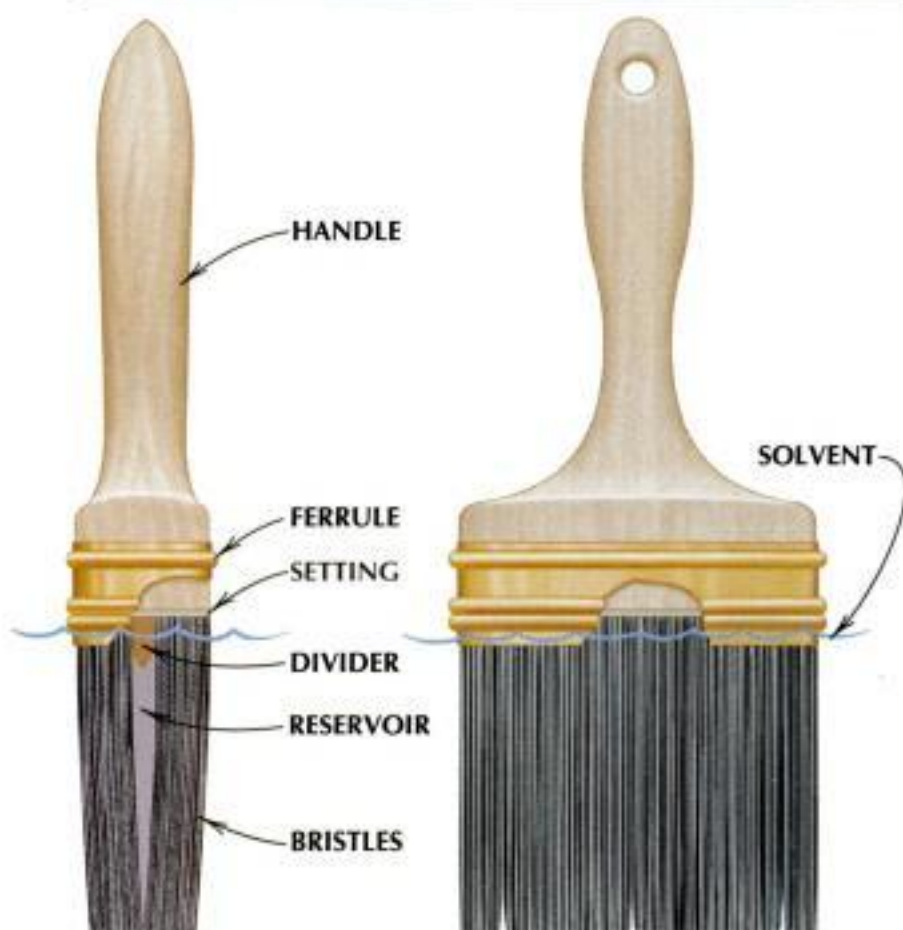
Tucked away in my toolbox is an assortment of the best brushes money can buy, some of them 20 years old. Top-notch brushes that are properly cared for will give you many years of pleasurable service; they'll even save money in the long run.

The main reason people use cheap brushes is the fear that they won't be able to adequately clean a good brush. They figure, "If I'm gonna have to throw a brush away, I'd rather toss a cheap one."

But there's no reason to work with inferior tools. Get good brushes and take care of them. You'll save time and get better finishing results. Here is my foolproof technique for guaranteeing clean, supple brushes for life.

## Priming a Brush

The first step in cleaning a brush starts before you dip it in your finish. Begin by soaking the brush all the way to the ferrule in whatever solvent will clean the paint: water for water-based paints, mineral spirits for oil-based varnish, alcohol for shellac and lacquer thinner for lacquer. This loads the reservoir—the space inside the brush just below the ferrule. (See drawing.) The solvent in the reservoir will prime the brush, helping the finish to flow off the bristles and preventing hard-to-reach clumps of finish from forming near the ferrule.



**Anatomy of a brush.** The bristles of a brush are divided to create a reservoir that helps hold the finish. Priming the reservoir with solvent before finishing will prevent clumps of finish from forming near the ferrule.



**Spin out the solvent.** Immediately after use, massage the bristles in solvent, then spin the brush between your palms to remove the solvent.



**Shape and store.** Roll the clean brush in thick paper, then fold over the end of the paper about an inch past the brush tip. Secure with a rubber band.

Remove excess solvent by squeezing the bristles between your thumb and first finger.

**A limited dip.** Now dip only the first third of the brush into the finish. Touch the tip of the brush to the side of the container, but don't scrape it over the edge. When brushing, allow only this last third of the brush to contact the wood, letting the finish flow off it while



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## freud

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leaning the brush over no more than 45° to the wood.

Sometimes, midway through a big job, the reservoir dries out and a crusty line of finish starts to form near the ferule. When that happens, I scrape off the finish, wash the bristles in solvent and squeeze out the excess. Then I go right back to work with clean bristles and a newly loaded reservoir.

## Cleanup

As soon as you're finished brushing, scrape the bristles against the container to return the excess paint back to the can. To clean the bristles, massage them in plenty of solvent until they're clean. Soaking alone won't do it. I often use two washes of clean solvent to make sure that all the finish is removed. Squeeze and shake or spin out any remaining solvent by twirling the brush between your palms. (See top photo, page 92.)

Don't worry about using too much lacquer thinner or mineral spirits. You

can "recycle" these indefinitely by letting the particles settle, then straining the solvent by pouring it through a clean rag or a coffee filter positioned over a can.

After the solvent scrub, go immediately to the sink and wash the brush with plenty of warm water and soap. Lather it up well, working the soap into the bristles with your fingers. Then rinse out all the soap. I use either shaving soap with lanolin, brush soap (available at craft supply stores) or shampoo. Repeat the lather-and-rinse cycle two or three times until all the solvent is gone. Rinse the bristles thoroughly, then spin out the water.

Even if you'll be using the brush again the next day, resist the temptation to simply soak the brush in solvent overnight. Complete the full cleaning schedule. Soap and water are cheap, and it is far nicer to start each day with a fresh, clean brush with nicely reshaped bristles—which you won't get from soaking alone.

## Reshaping the Bristles

The last step in the cleanup process is to reshape the bristles. To do this, first lay the brush flat on brown paper bag material and roll it up. (See bottom photo, page 92.) Then feel for the ends of the bristles, and fold the paper over approximately one inch past them. Secure this protective wrap with a small piece of masking tape or a rubber band. When it's time to use the brush again, it will look and feel as clean, well-shaped and supple as it did on the day you bought it. Think of it as the finisher's Rolls-Royce... ▲



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K. Reide, Seattle, WA



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A few reminders are in order: **LIN-SOAP™** will not be effective in removing the "baked" on dirt above electric base-board heaters. Generally, the higher the quality of paint and the glossier the paint surface, the easier it is to clean.

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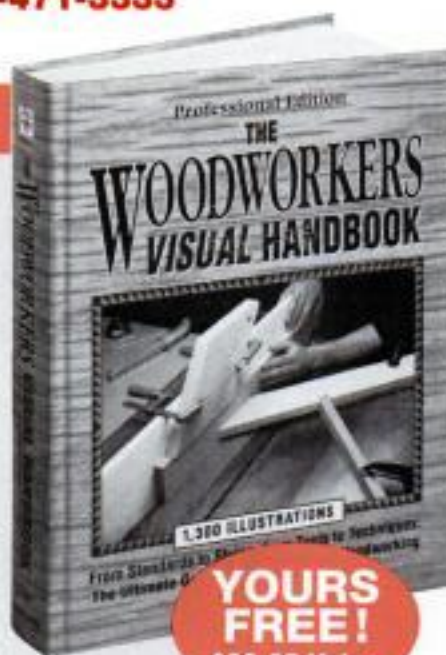
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## New Crosscut Contender

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## Smooth Performers

**Jesada Tools** (formerly CMT Tools—see p. 28) has introduced an improved line of router bits with a trademarked white, non-stick PTFE coating. The carbide tips on these bits are the smoothest and sharpest we've ever seen, thanks to Jesada's new, state-of-the-art grinding equipment. Test cuts in our shop produced exceptionally smooth profiles. *Jesada Tools, 310 Mears Blvd., Oldsmar, FL 34677, (800) 531-5559. Circle #605*



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## Double-Duty Nailer

Airy's new EZ-2 nailer/stapler can fire a range of both 18-gauge brads (5/8 in. to 1 1/4 in.) and 18-gauge staples (1/2 in. to 1 in.). We like the cushion-grip handle and double-trigger safety. The EZ-2 comes in a kit that includes over 4000 fasteners, wrenches, oil and a carrying case. (Price: \$189) Airy Sales Corp., 1425 S. Allec St., #C, Anaheim, CA 92805, (310) 926-6192. **Circle #609**



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—Michael Dresdner



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9862 12v 3/8" dr kit w/2 bat 174  
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# SHOP TEST

## The Mill-Right 3-Axis Router Milling Center

by Sven Hanson and Derek Roff

**V**erti-Mill, Precision Positioners, XYZ axes, Auxiliary Milling Table?? If this terminology makes you think of a metal shop milling machine, you're getting the right picture. They're just some of the features on the new Mill-Right 3-Axis Router Milling Center. This plunge router-based wood machining center offers almost limitless cutting capabilities: If you can name a joint, you can cut it with great precision on the Mill-Right.

Describing all the parts and functions of this milling center would take a book. (The company offers an excellent demonstration video for \$4.95, sold separately.) To simplify, the basic machine consists of two distinct workstations. The first is like a conventional router table; your router hangs upside down from a thick aluminum insert plate. You guide the workpiece over the router along a 23-in. fence that splits in the middle to surround the bit.

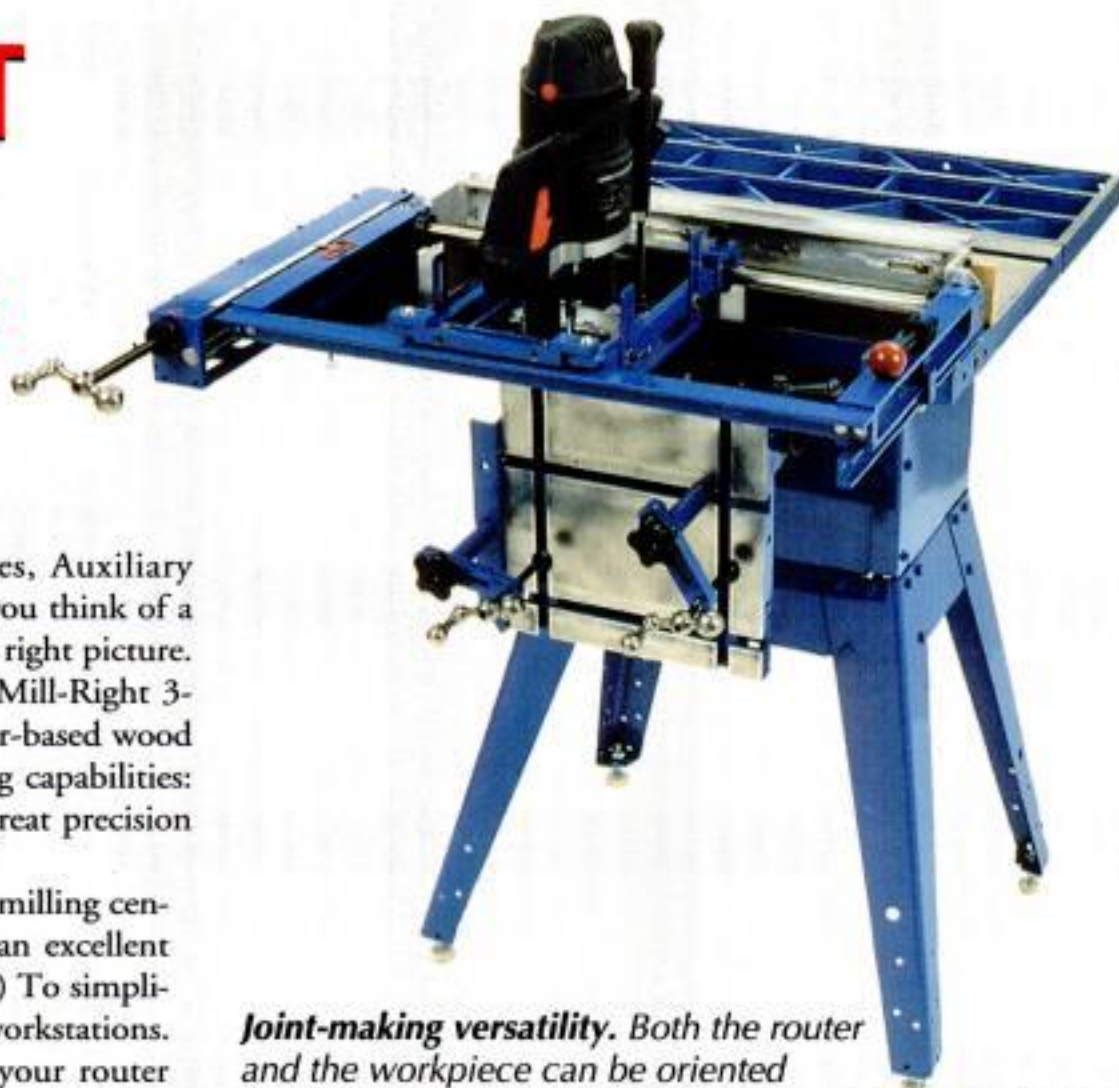
In the second station, you mount the router upright on a carriage that moves both side to side and back and forth, guided by a precision rod and lead screw. You clamp the work to the Auxiliary Milling Table that's located beside the main tabletop below the router and carriage. With the milling table horizontal, you can move the router over the work to plane the work surface, cut dados and sliding dovetails, or carve shapes, letters or numbers.

For other operations, you can adjust the milling table up to 90° in three different planes (XYZ axes) to position the work at virtually any angle you want. Combine this with three-axis bit movement, and you've got unlimited joint-making possibilities. (Anyone for compound angle tenons?)

An optional accessory called the Side-Mill (\$159) mounts the router horizontally for tasks such as horizontal boring and panel raising.



**Router table mode:** The optional Verti-Mill jig can hold work for cutting dovetails.



**Joint-making versatility.** Both the router and the workpiece can be oriented in different ways, to perform all sorts of precise joinery.

Other router-based joint-cutting machines use fixed templates to guide the bit, so their "programmed" cuts are limited to certain sizes and shapes. But the Mill-Right offers complete freedom to make cuts either by moving the work or moving the bit.

The Mill-Right's sliding carriage sports a much longer travel than template-type machines, and a milling machine-type lead screw lets you move the fence and router carriage to an accuracy of 1/128 in. Another option is the Spindle Mill (\$199) that holds the work between centers like a lathe to give you round cuts as well as flutes and tapers.

The Mill-Right is built like a battleship (it weighs 225 lbs.), and every surface is carefully painted or ground smooth. With both of us working, it took four hours to set up the machine (one person would take six to twelve hours), and some steps required four hands. In terms of floor space, its footprint is about 2 ft. by 3 ft., but you'll need a lot of maneuvering room for large stock.

During a month of testing, we cut a variety of joints. Without breaking a sweat, we could position the cuts to within 0.004 in. With practice, we got close to the manufacturer's claimed 0.001-in. repeatability.

The size, weight, complexity and cost target the Mill-Right toward serious woodworkers—especially those who appreciate machine-shop-like tolerances. Since each cut must be carefully dialed in, it may not be as convenient for mass production as a template-based machine. But the Mill-Right excels at machining precision joints in full-scale, custom furniture pieces—we agreed it's the prototype builder's dream date.

(Price: \$945.00; leg set: \$98; accessories from \$104 to \$199.) *Positive Position, Inc., Box 620, Schenectady, NY 12309, (888) 478-2453. Circle #611*

*Sven Hanson and Derek Roff work wood in New Mexico.*



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— American Woodworker,  
April 1997, pg. 90



M-3  
Baby Power Feeder

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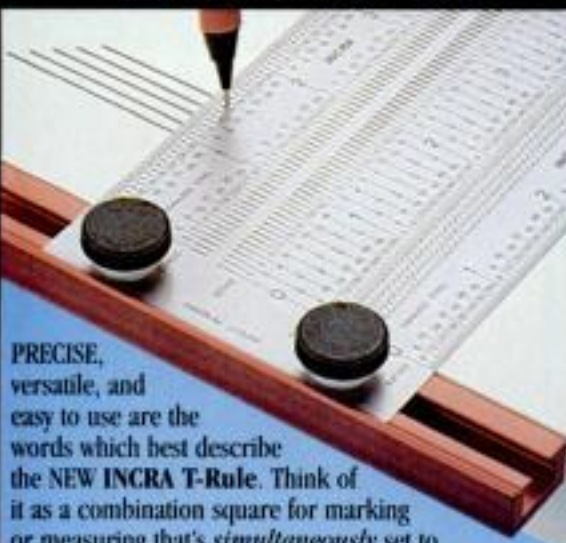
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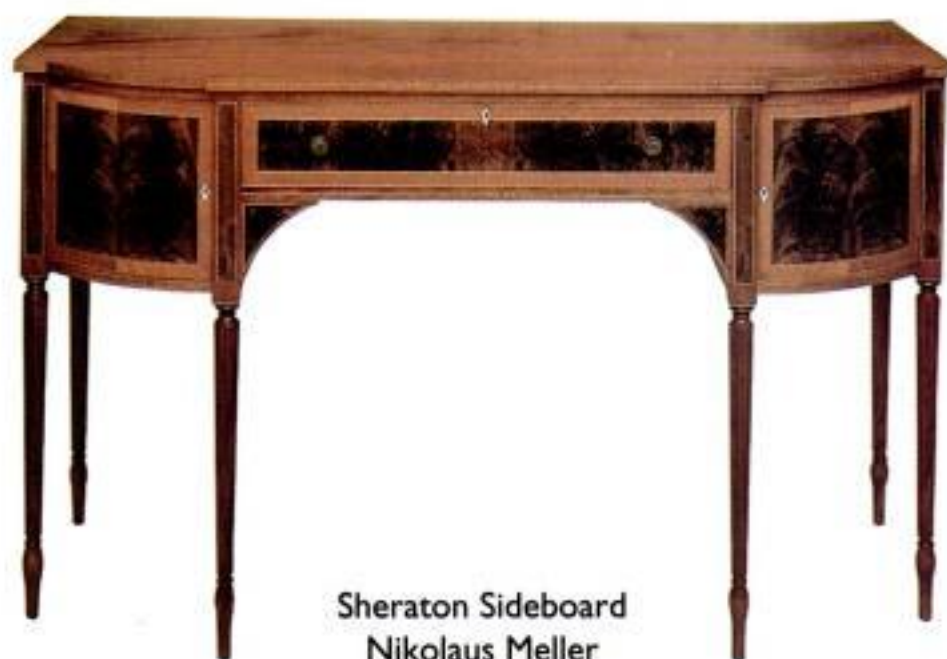
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### We're looking for a few good pieces—

furniture, turnings, carvings, musical instruments, marquetry, sculpture—to display in the gallery at our three gala wood-working shows in 1997-98. (See pages 14-16 for more on the show.) If your entry is chosen, you'll become eligible to win a cash prize of \$1,000, \$500 or \$250.

### Contest Rules

1. Send photos or slides and a brief description of your piece(s) by the deadline.
2. Anything made wholly or primarily of wood is eligible.
3. Photos and slides will not be returned.
4. If your entry is chosen, you agree to deliver it in person to the show and pick it up at the close of the show.
5. Send entries to: Gallery,  
The AMERICAN WOODWORKER SHOW™  
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Sheraton Sideboard  
Nikolaus Meller

PHOTO BY SETH JANOSKY

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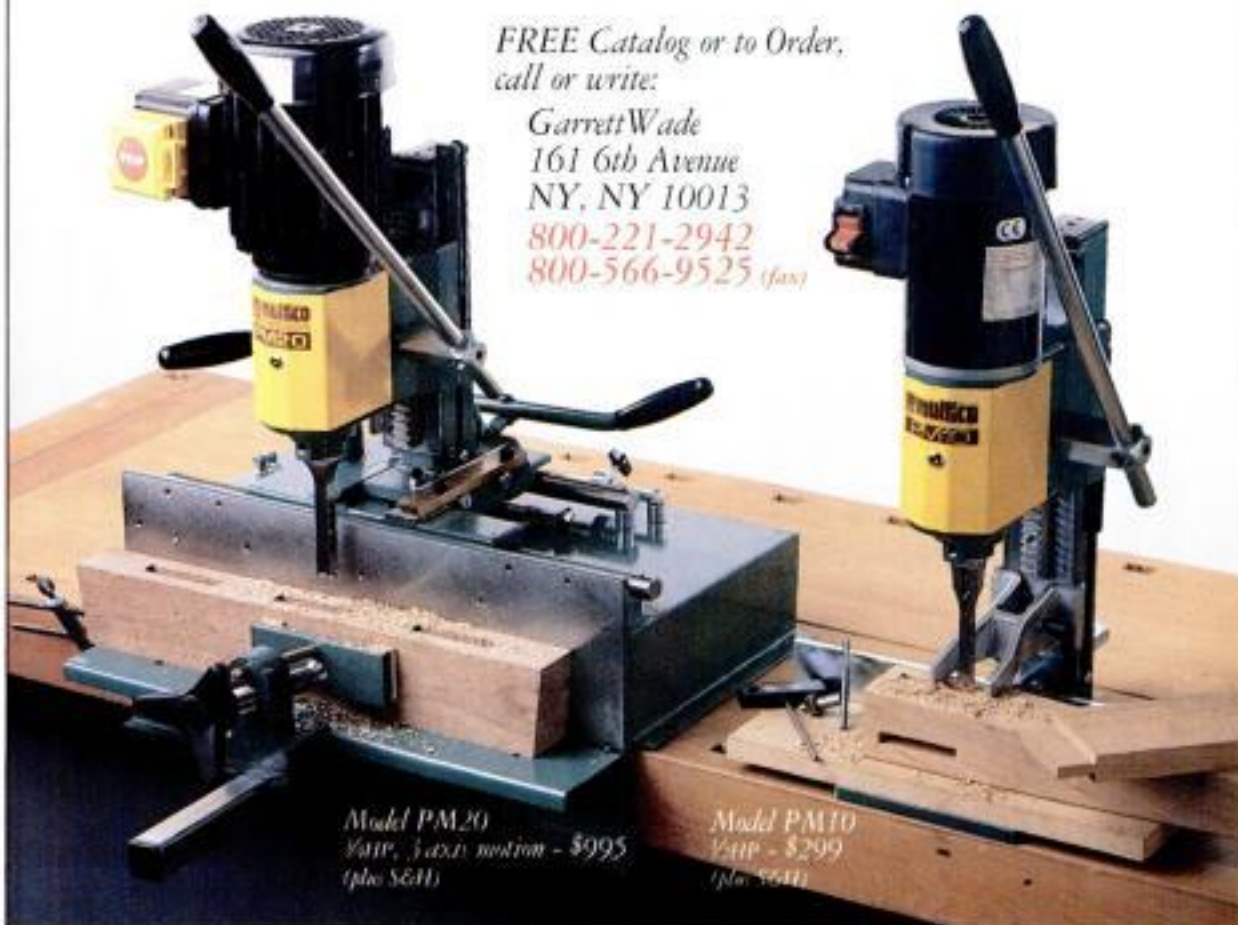
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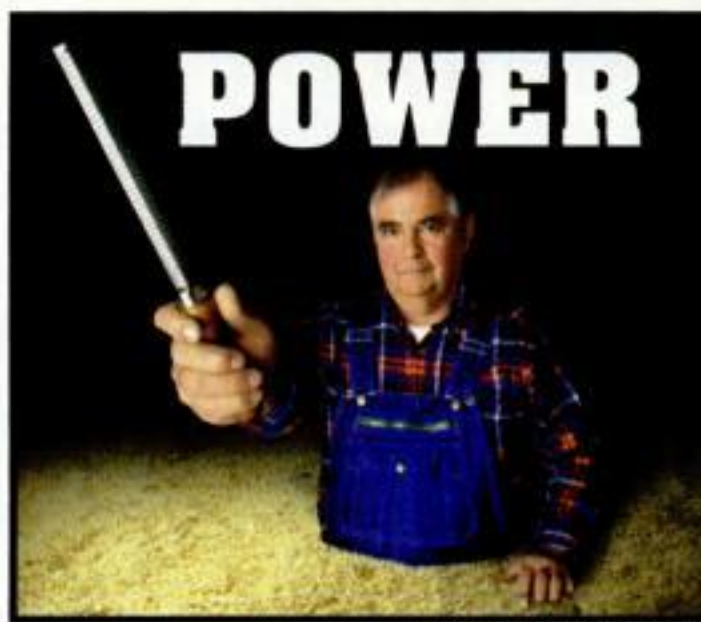
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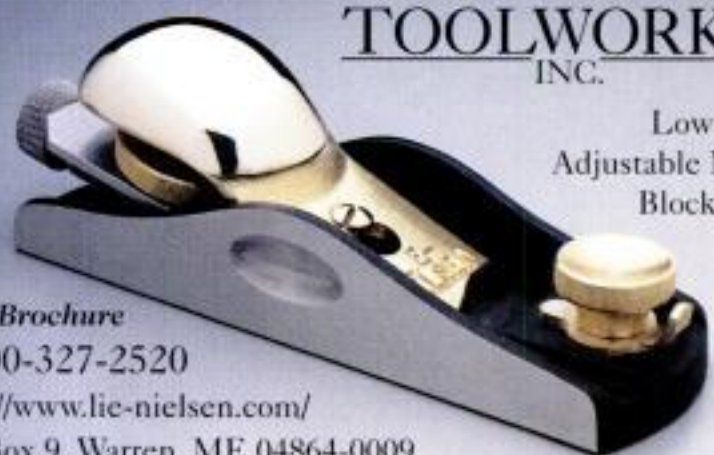
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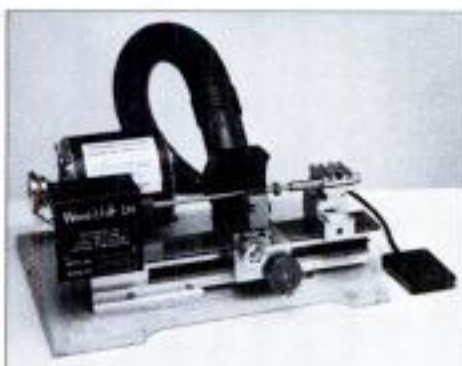
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# marketplace

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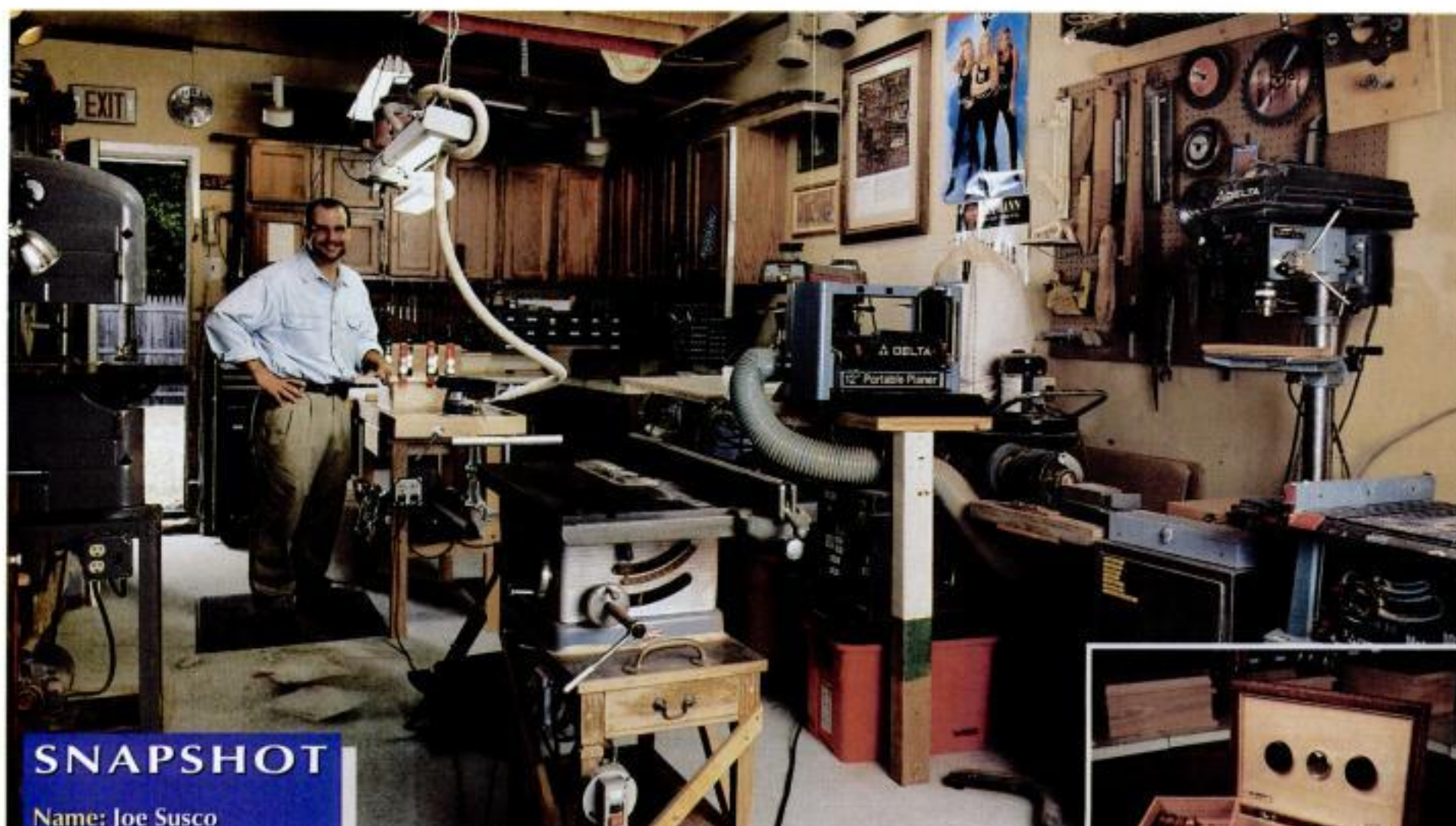
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# Going Pro in a One-Car Garage



## SNAPSHOT

**Name:** Joe Susco

**Age:** 45

**Occupation:** Carpenter, bartender, humidor maker

**Home:** South shore, New Jersey

**Years as a woodworker:** 25

**Shop location & size:** One-car attached garage; 286 sq. ft.

**Woodworking specialty:** Building humidors

**Next major tool purchase:** New 2-HP contractor's saw

**Next major project:** Build a replica of JFK's humidor that sold at a 1994 auction for \$520,000

**No wasted space.** An efficient shop floor plan is crucial for humidor specialist Joe Susco. His most popular model (inset) is made from oak and Spanish cedar.

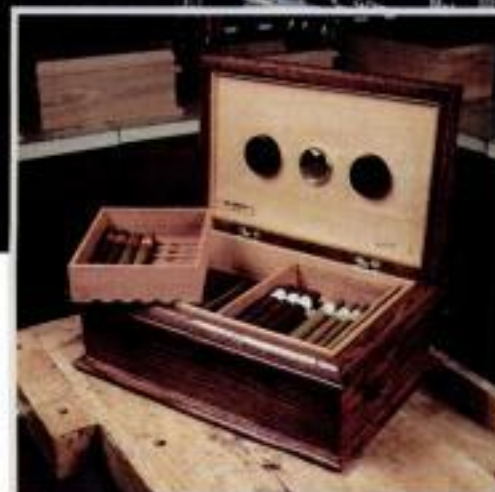
Joe Susco works as a carpenter most of the year, but turns to bartending during the summer tourist season on New Jersey's south shore. All year round, he's a cigar aficionado. But he was very disappointed with the humidor that he ordered through the mail from a cigar magazine. "The box was made from veneered particleboard, and the lining wasn't genuine Spanish cedar," Susco remembers. "I knew I could do better myself."

Susco made a humidor for himself, filled it with a few cigars, and took it to the bar where he works. Soon he had orders for more. Today he sells different models through cigar shops and by word of mouth. His most popular model holds 50 to 75 cigars and costs \$300. Susco typi-

cally builds the box from oak, lines it with Spanish cedar, and fits it out with brass hardware, a humidifier and a moisture gauge. (For more on humidor design and construction, see AW #53.)

Humidor production doesn't demand a large space—a good thing for Susco, because his shop is in a one-car garage. It has an efficient layout, with a workable balance between storage space, work surfaces and clearance for machine use. (See photo, above.) A vintage Craftsman tablesaw is mounted on wheels near the garage door. When Susco has long boards to cut, he just opens the door, moves the saw outside, and gains the required infeed and outfeed space.

Susco's favorite tool? "It's my Delta portable planer,"



he answers without hesitation. "I get the Spanish cedar roughsawn, and the thickness is far from uniform. The planer takes care of both problems. I really like the smooth surface I get straight out of the machine."

Susco believes that carpentry and remodeling work are great ways to get into custom woodworking. "The skills and tools overlap," he offers, "and once in a while you come home with some really useful stuff that someone was about to throw away." A great example of jobsite treasure occupies the back corner of Susco's shop: Upper and lower cabinets from a remodeled kitchen now provide storage space and a counter-top work surface.



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