

TAUNTON'S

August 1998

No. 131

Fine Woodworking

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to authentic
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mantelpiece**

**How to finish
small objects**

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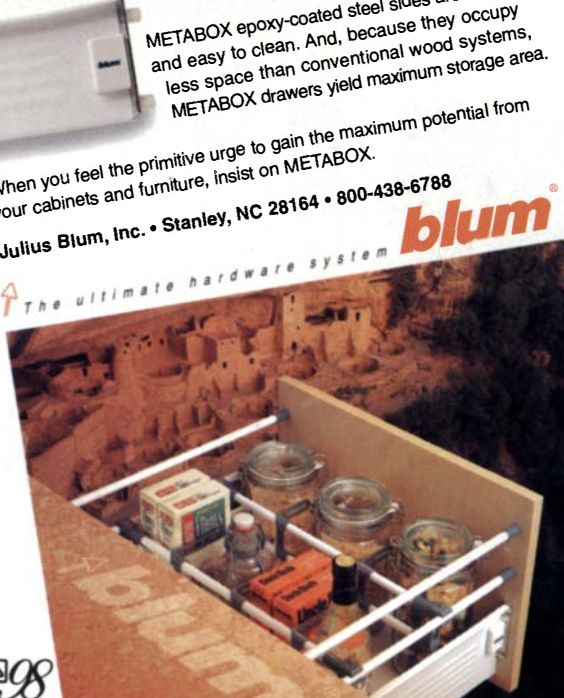
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On the Cover:

Learn how Charles Grivas made this one-drawer mahogany table with its unique molded top and tapered octagonal legs, on p. 40. Photo: Andre Baranowski



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Contributors

Michael Dunbar ("Rules of Thumb") is *Fine Woodworking's* newest contributing editor. He has been a professional woodworker since 1971. He is credited with starting the handmade Windsor revival and was dubbed the Dean of Windsor Chair Makers by *Yankee Magazine*. Over the years, he has taught more than 2,500 students in his Windsor chair classes in Hampton, N.H. Dunbar has written seven woodworking books, including *Make A Windsor Chair*, published by The Taunton Press (1984).



Curtis Erpelding ("Great Shop in a Garage") says his career is coterminous with *Fine Woodworking*. He first took up woodworking tools in earnest in 1975, the year the magazine was launched. His first article,

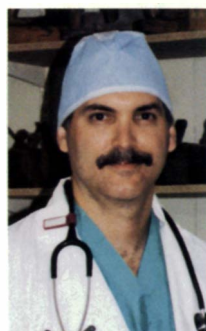
about a knockdown table, appeared in January, 1980. He has now contributed eight articles to the magazine and has made a *Fine Woodworking* video on radial-arm saw joinery.

Christian Becksvoort ("Elements of the Shaker Style") has been a woodworker for more than 30 years. He operates a one-man shop and design studio in New Gloucester, Maine. For a change of pace, he teaches, is a contributing editor to *Fine Woodworking* and is the author of *The Shaker Legacy*, available this fall from The Taunton Press.

Brian Boggs ("Master Class") is a chair maker in Berea, Ky. After he graduated from Berea College in 1982, he stayed on in the small town, joining the thriving woodworking community there. In the years since, he has developed a reputation for making handsome, comfortable and strong chairs. Of the nearly 1,000 chairs he has built, not one has come back with a failed joint.

Anthony Guildice ("Laminate Trimmers") earned a master's degree in photography at the Rochester Institute of Technology but took up woodworking instead. He received his training from his father and his father-in-law. Guildice has been making custom furniture and teaching woodworking classes for the past five years in St. Louis, Mo.

Gary Rogowski ("Versatile Plywood Drawers" and "From Rough to Finish") has been building furniture since 1974. His work has been shown in galleries nationwide and in five Taunton Press Design Books, and he has taught workshops around the country since 1980. Rogowski is a contributing editor to *Fine Woodworking*. He is the author of *Router Joinery* (The Taunton Press, 1998) and appears in its companion video.



Alan P. Marco, M.D. ("Woodworkers' First Aid"), is an anesthesiologist at the Johns Hopkins Bayview Medical Center in Baltimore. In his spare time, he is an avid woodworker and collector of antique woodworking tools. His wife, Catherine

Marco, M.D., assisted in writing this article. She is an assistant professor of Emergency Medicine at Johns Hopkins.

David Ashlinghurst ("Drilling and Driving") started woodworking in high school with an industrial arts teacher he calls the "crusty Mr. Kaitschuck" and bought a Shopsmith after a stint in the Navy. He has been building furniture and collecting tools ever since. He now lives in East Lyme, Conn., and works as a freelance writer.

Charles Grivas ("Bedside Table") has liked "putting things together with wood" ever since he was a kid. In 1981, he attended North Bennet Street School. For the past four years he has worked at Ian Ingersoll, Cabinetmakers in West Cornwall, Conn. Everyone says he has the sharpest chisels in the shop.

Fine Woodworking

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Letters

Love letters and hate mail—In spite of nearly 60 years of working with wood, I'm afraid I can't agree with the comments of a few of your readers regarding your recent editorial changes requesting that you "avoid the basic stuff" and a reference to "those who don't really care to know the difference between good design and bad." These comments are gratuitous slams not only to a number of good magazines but also to a considerable portion of your readers.

The fine woodworkers of tomorrow are the learning woodworkers of today, and I'm frankly offended that some of my brethren in the craft feel free to denigrate the talent level of those who may not measure up to their own beliefs of superiority. Personally, I enjoy and get a lot out of articles about how others sharpen their tools, bore holes and all the other basic operations we all perform. I have learned something from every article. Just because I have been doing something in a certain way doesn't necessarily mean there isn't a better way.

—Douglas M. Roberts,
West Lebanon, Maine

I am looking at my 10-year collection of *Fine Woodworking* wondering how this fine publication has gone so wrong. It could be the old masters are passing on and there is no one to take their place, or everything of value has already been said, or The Taunton Press is deliberately dumbing down to appeal to the weekend woodworker who is trying to build an entertainment center. Your recent issues are an insult to the intelligence and sensibilities of a professional or a serious amateur woodworker.

The inclusion of articles better suited to *Fine Homebuilding* is a major editorial mistake but a forgivable one. What is not forgivable are articles by craftsmen like Steve Latta ("Strong, No Clamp-up Corner Joints") who seems to still be building curb furniture, or Lon Schleining ("Joint-Quality Edges Cut on a Tablesaw") trying to lose his fingers or John Lively building doors ("Build a Houseful of Doors") with biscuits instead of tenons. Maybe these guys really do create beautiful objects in wood, but you can't tell from this stuff. If this sounds harsh, understand that yours is the last

woodworking magazine I subscribe to, so it hurts to see this happen. I really hope you put some beauty and content back in the publication.

—Thomas Chamberlin, Highland Park, Ill.

As a long-time subscriber to *Fine Woodworking*, it gives me great pleasure to say that your recent improvements have taken a first-class publication to extraordinary heights! Every article in the recent issue was enticing and made for worthwhile reading. The changes in format, too, make the articles more inviting. I look forward to the other changes you outlined.

—George D. Sutcliffe Jr., Holderness, N.H.

At \$6.95 an issue, I expect a quality product. I do not expect hints on screwing baby-food jars to the bottoms of shelves. If you find yourself with too little to print for your hints department ("Methods of Work"), consider a reprint from the early years. Why not run a gallery department. Include pieces of furniture from readers, professionals and amateurs alike.

—Jim Wright, Berkley, Mass.

More saw-nib theories—During the early part of my 30-year career in residential construction, I had the opportunity to work with many older men with much more knowledge and experience than I, and I was fortunate enough to learn how to use hand tools as a matter of practical necessity on the job.

I was taught that the nib found on some handsaws was used as a pivot point when using the saw as a compass. A nail would be driven at one end of the radius, the nib of the saw would be held against the nail, and a pencil or scribe would be held at the other end of the radius by the corresponding tooth in the saw. The saw was then swung around to scribe or mark the arc or circle as needed.

—Mark Poulson, Los Angeles, Calif.

Fifty years ago, I asked a 75-year-old carpenter about the nib stamped into the back of some handsaws. He told me it was a starter tooth. Put the back of the saw on the line, and push or pull so the nib takes a little bite out of the wood to make a notch to start the cut.

—Cliff Muenchow, Seaforth, Minn.

Not to belabor the best part of *Fine Woodworking* with trivia, but the discussion about the nib on a handsaw might have mentioned that as a decorative feature, it complemented the curve found on many older skew-back saws.

Some saws also had decorative etchings on the blade. Disston used a keystone incorporating the model of the saw. Other brands had sailing ships or other decorations. Also, when a cabinetmaker bought a new saw, he might pour hot wax over part of the blade, scratch his name in the wax when it cooled and then etch the saw with muriatic acid.

—R.W. Brinkworth, Yardley, Pa.

Jointing on a tablesaw—I have learned a lot from your magazine over the years. Whenever my apprentices ask questions, I push the stack of *Fine Woodworking* magazines and books at them with the words, "Read first, and then we talk."

But woodworking has its serious sides, too. The article by Mr. Schleining (*FWW* #129, pp. 82-85) about jointing boards on a tablesaw needs one important adjustment: a guard covering the blade.

I have used the same technique for years. One day, that last push where the hand passes the blade took my thumb.

My woodworking friends, please find that silly guard, and enjoy woodworking.

—Aiko van Hulsen, Zionsville, Ohio

The perfect mortise—I cannot disagree with Strother Purdy on the need and description of a proper fit of a mortise and tenon (*FWW* #130, pp. 58-63).

Over many years, I have made all the mistakes possible—too tight, too loose and too rough. I have resorted to the use of veneer and kraft paper shims. I have made single projects with more than 100 mortise-and-tenon joints on them. I have devised my own slot mortiser similar to those described in Purdy's article, and I am now happy with the

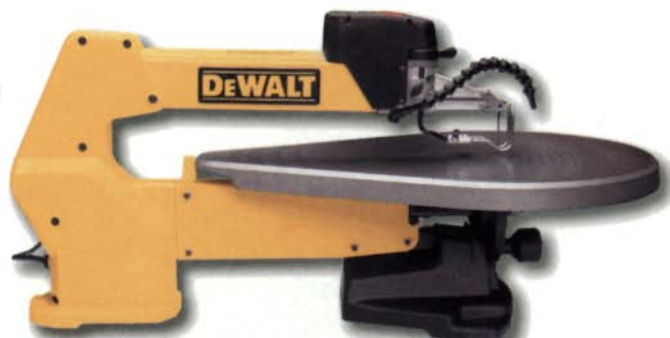
Writing an article

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Letters (continued)

quality of my mortises. But that is only one-half of the joint. Tell us more about how to make good tenons.

—*Marshal G. Baldwin, Westport, Conn.*

Further thoughts on tripod

pedestals—Regarding Phil Lowe's comments on tripod pedestal table bases (*FWW* #129, p. 16), chair placement and people's feet are not the main point here. Table loading is more important.

When the tabletop is loaded, it sags in the center—assuming that the table is well made, all joints are tight and the top is securely attached to the pedestals. (No structure is infinitely stiff.) The sag is more evident when the table is fully extended. Because the pedestals are firmly attached to the top, they tilt toward the center when the top sags under load. On a tripod pedestal table that has the two legs on each pedestal facing in, the load is effectively taken by four legs. If the pedestals are reversed, the load is transferred to only two legs, making the table unsteady.

If the table is heavily loaded and the legs are situated as suggested by Mr. Lowe, you can often see single outer legs that don't even touch the floor.

—*Mike Hide, Atlanta, Ga.*

Locust decay resistance—Regarding Jon Arno's comment in your last issue (*FWW* #130, p. 102) that attributes decay resistance to the presence of tyloses: Arno is incorrect. Tyloses are parychamatic outgrowths that fill the vessels, generally because of injury or conversion of sapwood to heartwood. Tyloses have absolutely nothing to do with decay resistance but are more associated with permeability. Decay resistance in wood

is solely a factor of the type and concentration of extractive chemicals.

—*Stanley S. Niemiec, Aumsville, Ore.*

EDITOR'S NOTE: We checked with our contributing editor R. Bruce Hoadley, who is a wood technologist at the University of Massachusetts. Hoadley agrees with Mr. Niemiec: Tyloses have nothing to do with a wood's decay resistance.

Finishing cherry without blotches—

I felt that Jeff Jewitt covered all the bases in his quite thorough article on finishing cherry (*FWW* #130, pp. 46-49). He seems to maintain that deep respect for the natural color and depth of aged cherry while trying to avoid that six months of "pink-salmon hues" common to clear finished cherry. Because having finishes on both sides of any wide material is essential to stability, it seems a logical move, after test stains on scraps, to stain the underside of tabletops first. Even on 2-in. material, this gives a good indication of color and of problems that might occur.

—*Andy Brady, Angelica, N.Y.*

What's in a name—You might want to be aware that your new department "Rules of Thumb" might not have the best name. Everybody knows that rules of thumb are rules that are easy to remember. The problem is that the rule of thumb is based on a 17th-century law that states, "You may beat your wife with a stick as long as it is no thinner than your thumb."

We sometimes say that we don't do sexist things and that women are welcome in the male-dominated world of

woodworking, yet sometimes sexism is so deeply imbued in our culture we don't even see it. —*Mark Janssen, Chicago, Ill.*

How about plans? The work done by John McAlister Jr. (*FWW* #129, back cover) is inspiring. While I will not be 73 years old for another 14 years, I have set a goal of accomplishing something akin to McAlister's secretary by the time I am his age.

The photograph of his work is beautiful, but, alas, there are no plans. I think the lack of plans is a major shortcoming of your magazine. It would be a great help if plans were available through the magazine or if a reference were made as to where they could be purchased.

—*Michael Pargament, West Hills, Calif.*

Clarification—Independence Tool Co., which was featured in "Tools & Materials" under the headline "A well-made dovetail saw with British roots" (*FWW* #130, p. 34), has moved, and the phone number has been changed to (717) 584-6440.

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Working wood is inherently dangerous. Using hand or power tools improperly or ignoring standard safety practices can lead to permanent injury or even death. Don't try to perform operations you learn about here (or elsewhere) until you're certain they are safe for you. If something about an operation doesn't feel right, don't do it. Look for another way. We want you to enjoy the craft, so please keep safety foremost in your mind whenever you're in the shop.

—*Timothy D. Schreiner, editor*

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for fellow enthusiasts

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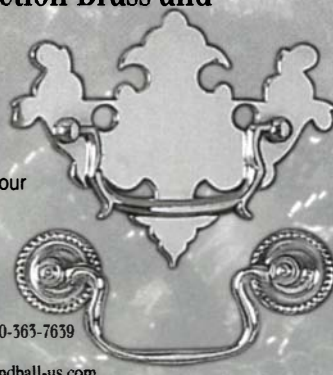
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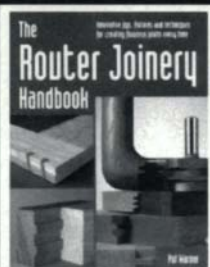
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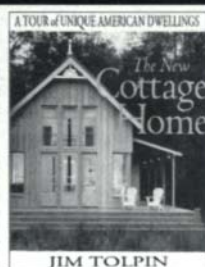
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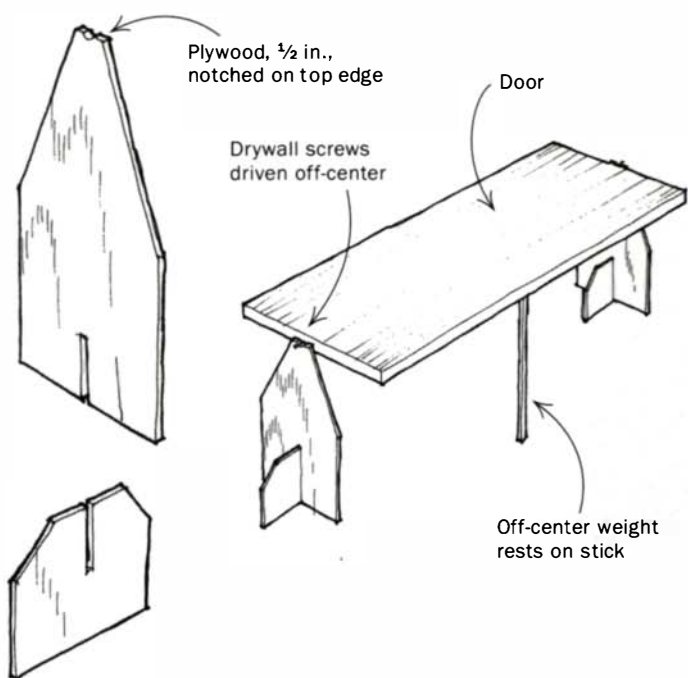
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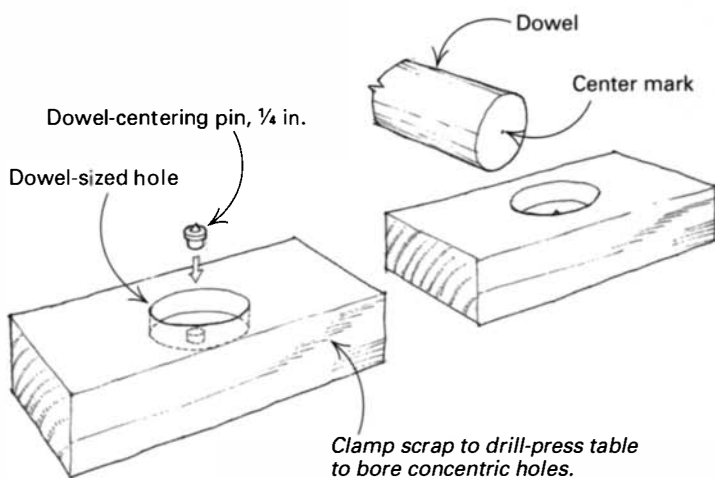
Finishing stands for large doors



These knockdown stands make it easy to put a finish on doors. Cut the stands from 1/2-in. plywood in two pieces that slip together, as shown in the sketch. Drive a 3-in. drywall screw halfway into the top and bottom of the door, 1 in. off the centerline. With the screws as a pivot point, place the door on the stands. Prop up the heavy side with a stick cut to the correct length. The off-center weight of the door will rest on the stick to present an unobstructed horizontal surface ready for finishing. After the finish has set and there's no risk of sag, take the stick out, and swing the door to a vertical position to dry.

—Brad Lewis, Edwardsville, Ill.

Dowel center finder



Here's how I made a center finder for dowels that use one of those readily available metal dowel-centering pins.

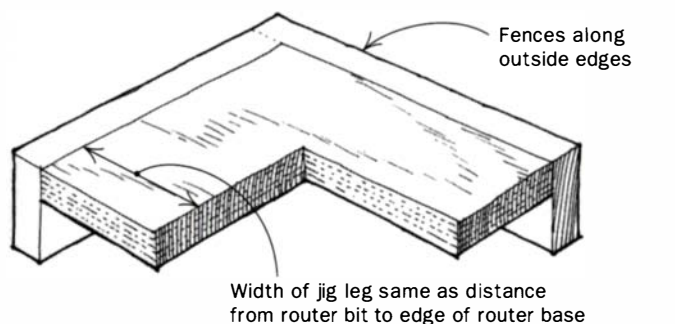
Clamp a scrap of wood to your drill-press table. Drill a hole the same size as the diameter of the dowel, 3/8 in. deep, using a Forstner bit. Without unclamping the wood, remove the Forstner bit, substitute a 1/4-in. brad-point bit, and drill a hole in the center of the original hole about 5/16 in. deep.

Insert a 1/4-in., metal dowel-centering pin in the center hole. Make sure it is seated securely. Place the dowel in the hole, and press down firmly. The indentation left by the point of the centering pin should be exactly in the center of the dowel.

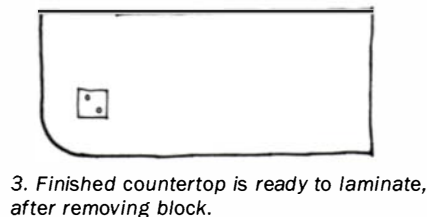
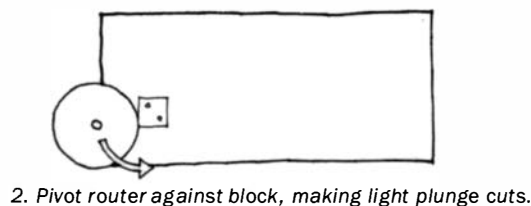
Because the flange diameter on the 1/4-in. metal pin is 3/8 in., you're limited to finding the center of dowels larger than that.

—John Saggio, Little Neck, N.Y.

Radiused corners on countertops



1. Position block with jig and fasten.



3. Finished countertop is ready to laminate, after removing block.

I like to put a radiused corner on any countertop that projects into a traffic area: The corner won't hurt as much when you bump into it. This simple jig, used with a scrap block and a plunge router with a round base, helps me cut the corner quickly and accurately. For plastic laminate counters, I cut the corners of the core before applying the laminate.

Measure the distance from the edge of your router base to the cutting edge of a straight bit placed in the chuck. Cut an L-shaped

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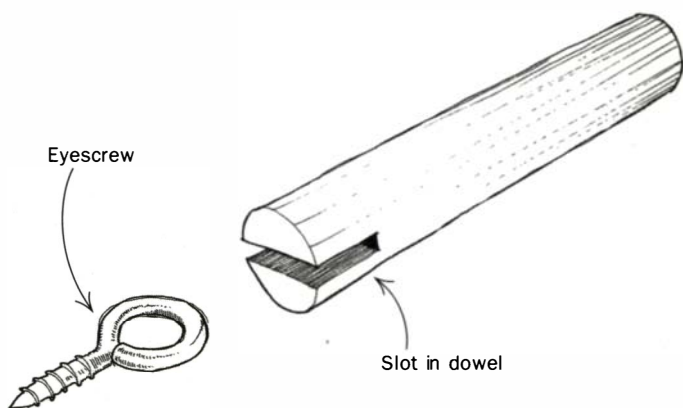


Methods of Work (continued)

piece of plywood with each leg the same width as the bit-to-base distance. Attach fences to the long sides of the jig so that it will butt square against the corner of the countertop.

With the jig held in place on the corner, nail or screw a scrap block to the countertop core. Remove the jig, and make light cuts with the router against the block, plunging $\frac{1}{4}$ in. at a time to cut the radius.
—John Bousfield, Cocoa, Fla.

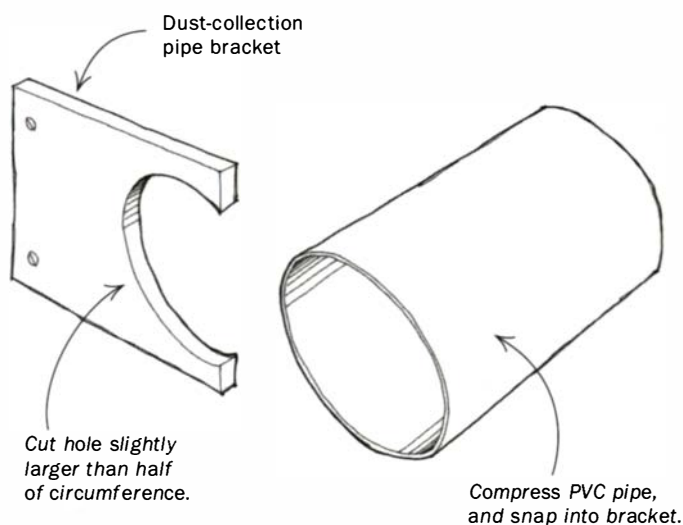
Driver for eyescrews



Installing hook screws or eyescrews is hard on finger and thumb, especially if you have a lot of them. It takes just a few seconds to make this little tool that acts like a screwdriver. Simply cut a slot in one end of an appropriately sized dowel.

—Yue Ma, Burnaby, B.C., Canada

PVC vacuum system tips



These brackets are quick and easy to make and work especially well with a dust-collection system made of thin-wall PVC pipe. If the system becomes clogged, the brackets allow pipes to be removed, cleaned and snapped into place in seconds.

To make a bracket, trace the pipe's perimeter, and cut out one end of a bracket board so just over half the pipe's circumference is held by the cutout. Attach brackets to the wall or to ceiling joists.

Compress the flexible pipe as you snap it into each bracket.

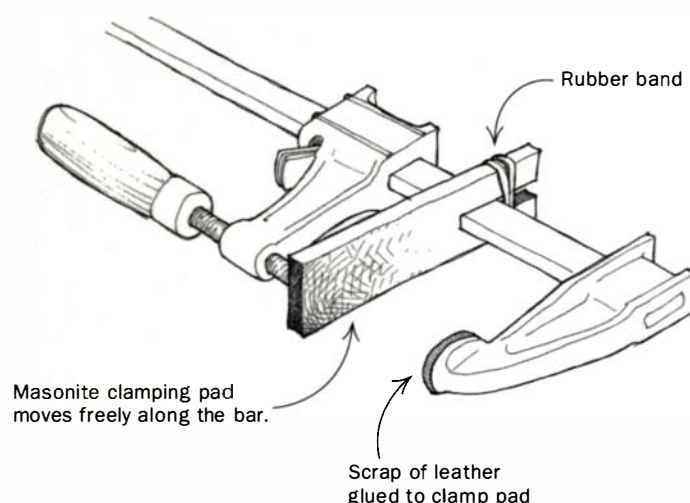
To ground a PVC pipe system, run metal furnace tape along the length of the outsides of the pipes. Fold the tape inside the elbow joints so that it contacts the tape on the straight lengths.

—Peter Sieling, Bath, N.Y.

Quick tip: Pieces of used pressure-sensitive sandpaper can be stuck on jigs and clamps to provide a non-stick surface. For example, a small piece of pressure-sensitive sandpaper applied to the jaws of wooden hand screws will help stop the workpiece from slipping when clamping pressure is applied.

—Joseph C. Denefeld, San Francisco, Calif.

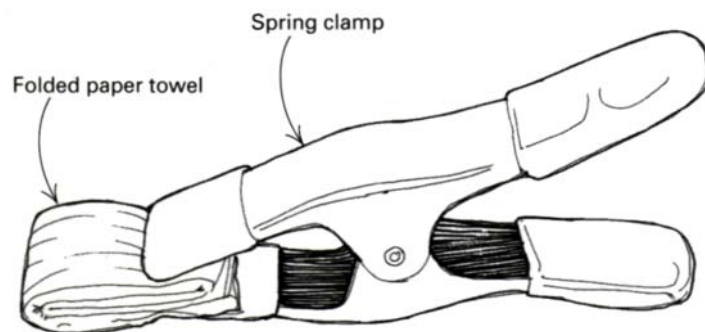
Clamping pads for bar clamps



I don't have a third hand to hold a non-marring pad under the screw of my bar clamp. So I cut a slot in a scrap piece of Masonite and attached it loosely to the clamp bar with a rubber band. To pad the other end, I glued a piece of shoe leather to the clamp jaw.

—Ted Tedeschi, Prescott Valley, Ariz.

Disposable swab



When applying a small amount of stain or finish, I make a swab by tightly folding a piece of cloth or paper towel into a pad. I then lock the pad into a small Vise-Grip or a spring clamp, so I can



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6"	180	44.55	250
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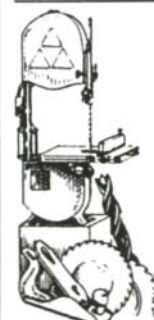
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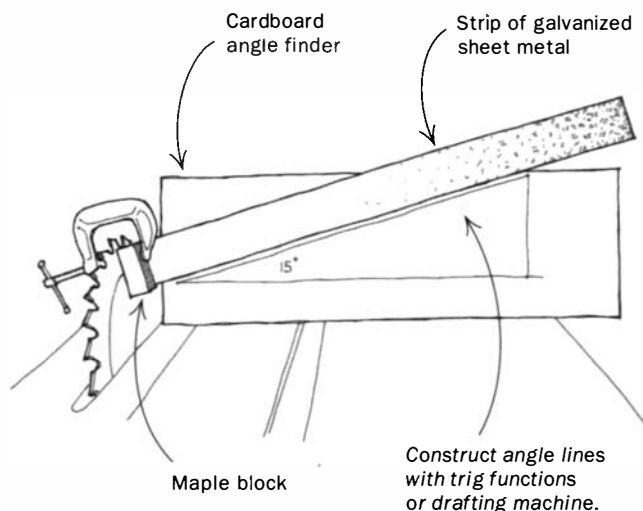
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Methods of Work (continued)

hold it during use. When I'm finished applying the stain, I just throw away the pad. —Omar V. Showalter, Harrisonburg, Va.

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To use this device, crank up the blade partway, and then clamp it onto the blade with a small C-clamp. Be sure to clamp the wooden part to a flat, clean area of the blade, avoiding any carbide teeth that are thicker. The metal strip serves as an indicator: The angle at which it is inclined is an accurate gauge of the tilt angle of the blade.

For each desired angle setting, make up an angle finder from a piece of cardboard. Scribe the desired angle on the cardboard using a drafting machine, or construct the angle using trigonometric functions and a calculator. Place the cardboard finder behind the gauge, and then tilt the blade until the angle matches the line on the finder.

—Helmut Wolf, Albuquerque, N.M.

Methods of Work buys readers' tips, jigs and tricks. Send details, sketches (we'll redraw them) and photos to Methods of Work, Fine Woodworking, P.O. Box 5506, Newtown, CT 06470-5506. We will return only those contributions that include an SASE.

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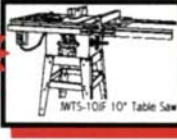
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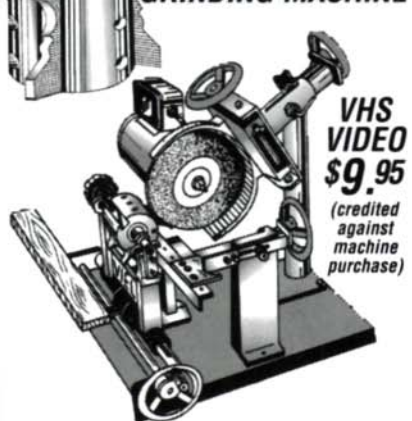
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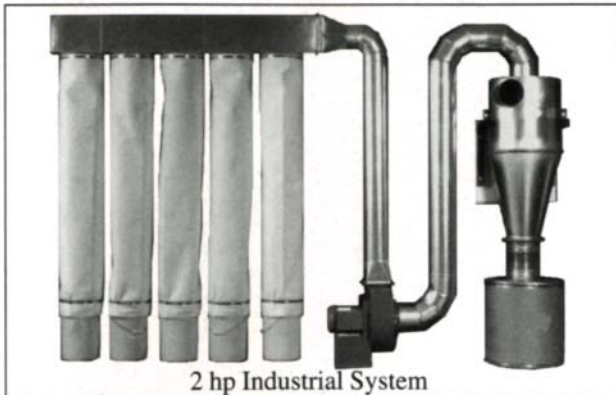
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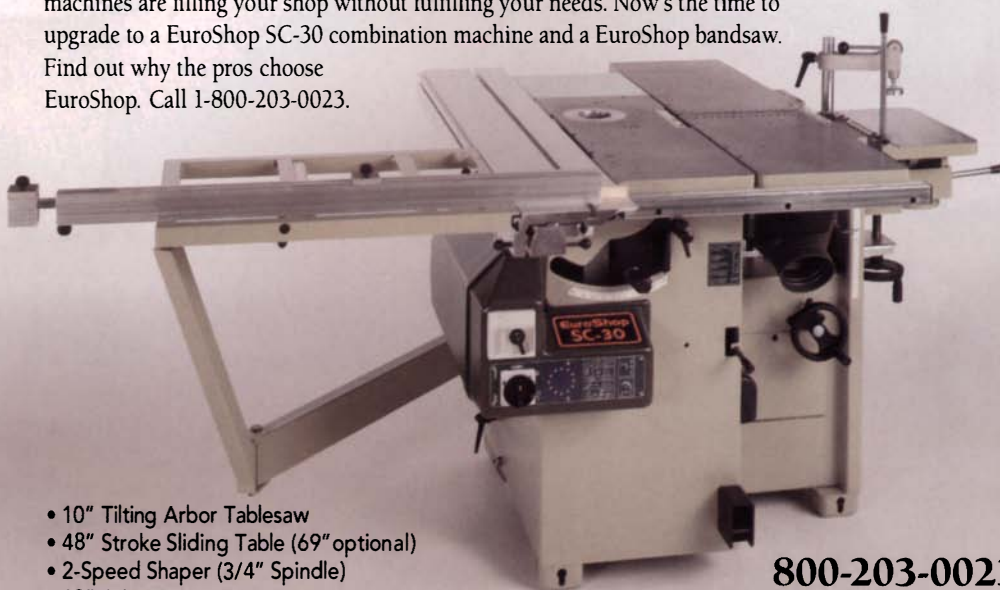
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DeWalt 8-1/2" & Ryobi 8-1/2"x60T x 5/8"	\$179	\$109
Delta 9"x80T x 5/8"	\$204	\$119
Ryobi-Makita & all 10"x80T x 5/8"	\$207	\$129
DeWalt, Makita, B&D, Hitachi 12"x80T x 1"	\$229	\$139
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8" x 80T x 1/8" & 3/32"K	\$202	\$169	12"x100T x 1-1/8"	\$253	\$215
220mm x 80T x1/8" x 30mm	---	\$159	14" x 80T x 1"	\$232	\$197
9" x 80T x 1/8" & 3/32"K	\$207	\$179	14" x 80T x 1"	\$266	\$226
10" x 80T x 1/8" & 3/32"K	\$207	\$159	16" x 80T x 1"	\$262	\$223
12" x 80T x 1-1/8" K	\$212	\$181	16" x 100T x 1"	\$294	\$243

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WOODWORKER II	LIST	SALE	10%	20%
14"x40T x 1"	\$215	\$149	\$134	\$119
14"x30T x 1"	\$195	\$139	\$125	\$111
12"x40T x 1"	\$183	\$129	\$116	\$103
12"x30T x 1"	\$162	\$119	\$107	\$ 95
10"x40T x1/8" or 3/32"	\$156	\$119	\$107	\$ 95
30T 1/8" or 3/32"	\$135	\$ 99	\$ 89	\$ 79
9"x40T	\$146	\$109	\$ 98	\$ 87
30T	\$125	\$ 99	\$ 89	\$ 79
*8-1/4"x40T x3/32"	\$136	\$ 99	\$ 89	\$ 79
8"x40T 3/32"	\$136	\$ 99	\$ 89	\$ 79
30T	\$115	\$ 89	\$ 80	\$ 71
7-1/4"x30T 3/32"	\$112	\$ 69	\$ 62	\$ 55
**6"x40T 3/32"	\$136	\$ 89	\$ 80	\$ 71

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14"x60T x 1" 1/8"K	\$224	\$159
12"x60T x 1" 5/8" 1/8"K	\$198	\$139
10"x60T x 5/8" 3/32"K	\$162	\$129
9"x60T x 5/8" 3/32"K	\$156	\$119
8"x60T x 5/8" 3/32"K	\$150	\$109
8-1/4"x60T x 5/8" 3/32"K	\$150	\$109
7-1/4"x60T x 5/8" 3/32"K	\$150	\$109

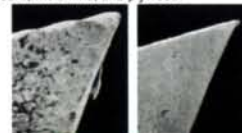
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Standard C-2 Carbide (below, left) and FORREST still sharp Oxidation and Corrosion Resistant Sub-Micron C-4 Carbide (below, right). Each shown after cutting 3,500 feet of MDF. Similar results obtained cutting particle board, melamine, and plywood.



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10" D. 5/8" & 1" Bore	\$389	\$349	\$314	\$297
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Fine Woodworking Magazine test, Oct. '96, page 43

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American Woodworker, April 1998, pp. 64-69.

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Notes & Comment

These sticks were made for walking



Photo: courtesy of the White House

Bige Newman of Harrison, Tenn., wrote to us of his latest woodworking triumph: "During the past 20 years, I've made over 2,000 walking sticks out of every kind of wood I could find: snakewood, ebony, pink ivory—you name it. Sometimes I'll glue as many as eight different woods together and then turn them into one stick. In May 1997, I sent President Clinton a stick made from several colors of maple. Later I received a call from his secretary, who said that among the scores of walking sticks the President received after his knee surgery, my maple stick was Mr. Clinton's favorite; it's the only one he took with him on his subsequent trip to London."



Newman's own.
When President Clinton visited London last year, he brought along a walking stick made by Tennessee woodworker Bige Newman.

Jeffrey Greene wins *Fine Woodworking* award

At the fourth annual Philadelphia Furniture & Furnishings Show, *Fine Woodworking* presented Jeffrey Greene with its annual Apprenticeship Program Award. The \$1,000 award, offered to one exhibitor at the show, is intended to help a woodworking or craft enthusiast enter the field of furniture or furnishings craftsmanship and learn from an established craftsman.

Greene, whose design studio is in Doylestown, Pa., has conducted a successful furniture making apprenticeship program for 22 years. As testament to the quality of his program, five former apprentices were exhibitors at the Philadelphia show. Greene will use the award to assist a deserving apprentice in meeting the financial demands of the program.

The show was held April 17-19 and had an attendance of 11,000. For information on next year's show, call (215) 440-0718. To contact the Jeffrey Greene Design Studio, call (215) 348-5232.

Wood Webs

Davey Tree Expert Co., a nationwide tree-trimming outfit, now has a Web site (www.davey.com). Once you get to its homepage, click on Preserving Our Natural Resources. From there, click on National Register of Big Trees. The register has a search engine for 269 species of trees and their locations. Did you know that the largest black walnut in the country is in Humboldt County, Calif., and it has a girth of 278 in.? Wow!

If you're looking for that special plane or ruler, you might want to check out David Zeidman's Web site (www.toolsrules.com). He's a hand tool dealer in Belmont, Calif. An added benefit of his Web site is that you can call up photographs of most of the tools he offers. Just in case you always wanted to know what a Stanley No. 62, circa 1909 block plane looks like, this is the place to go.

Have you found any interesting woodworking Web sites? Send the address to jkolle@taunton.com.

—Jefferson Kolle, senior editor

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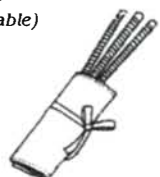
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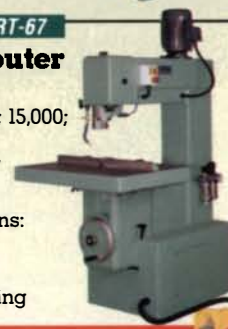
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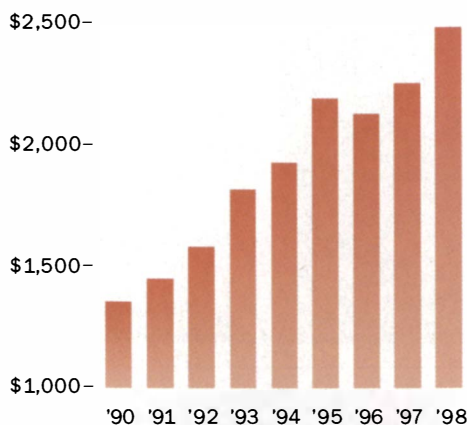
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A not so cherry report

This price chart might look like the upward stampede of the raging bulls of Wall Street, but no, the graph does not represent the Dow. It's the wholesale price per 1,000 bd. ft. of boxcar loads of 4/4 FAS cherry since June 1990.

The immense popularity of cherry around the world is responsible for the steep pitch of the graph, as demand strains supply and the price goes up. Not only is cherry the most sought-after wood for cabinetwork and furniture in America, but many of our highest grade cherry logs are being shipped to Canada and overseas.

To meet the strong demand and reap historically high prices, loggers are cutting

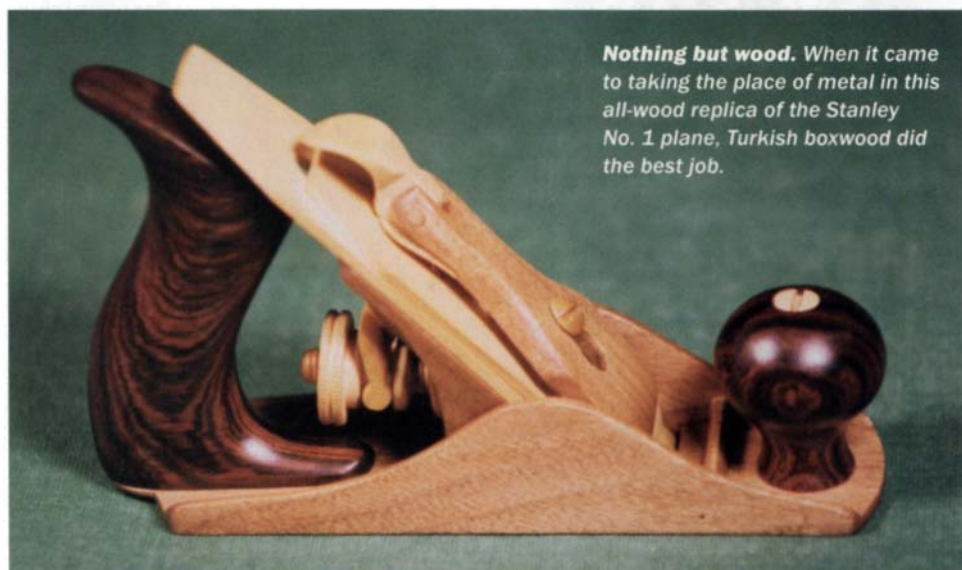


The high price of cherry. It's up, up and away for the wholesale price of Appalachian 4/4 FAS kiln-dried cherry, according to prices between June 1990 and April 1998. Statistics courtesy of the Hardwood Market Report.

smaller and smaller trees—ones that might have been better off left to grow. In Virginia, where I run a small lumber company, the supply of cherry logs is extremely tight. Several months ago, I purchased a few thousand board feet of export-grade saw logs from Pennsylvania. These were some of the best cherry logs available anywhere, and still they were smaller and sappier than I would have liked. And they were expensive. Five years ago, I paid 60 cents a board foot for similar logs. These cost me \$160 a board foot, a jump of 267%!

By the time I cut out the undesirable white sapwood and the shaky heartwood and then air and kiln dry the lumber, I'll need to charge between \$5 and \$10 a board foot just to stay in business.

—Redmond Manierre, *The Plains, Va.*



A Stanley No. 1, please hold the metal

Like so many craftsmen, Herb Kean of Morristown, N.J., enjoys making something no one has ever made before. Therein lies the impetus behind his replica of the diminutive Stanley No. 1 handplane, made entirely of wood. Yes, every screw, washer, nut, stud, pin, casting, blade and spring is wooden.

The body of the plane, though it cries out to be made from individual pieces, is carved from one piece, simulating the original iron casting. All of the parts that are metal in the original Stanley No. 1 are made from boxwood, except for the castings, which are made from butternut for ease of carving and some grain display.

Using both hand tools and power tools, Kean fashioned all of the pieces to tolerances ranging between 0.002 in. and 0.010 in. Matching the tap drill size to the tap and the dowel size to the die were far more critical with wood than with metal. And the delicacy of the hand threading was a challenge. To Kean's surprise, wood did everything metal could do. A tiny chip was even thrown up when planing pine! A long-time collector and restorer of antique tools, Kean has just completed the second edition of *A Price Guide to Antique Tools* (Astragal Press, Mendham, N.J.; 973-543-3045).

—Marc Vassallo, associate editor

Bury yourself in your work

Along with courses such as Repair and Restoration of Woodworking Tools, Traditional Scandinavian Spoon Carving and Build a Windsor Chair, the North House Folk School in Grand Marais, Minn., offers a course called Build Your Own Casket. The three-day workshop covers details such as joinery, handle construction, hardware and proper sizing.

According to the course description: "The finished casket need not wait for a final departure before being put to use. Above ground applications include use as bookshelves, coffee tables, storage containers and entertainment centers. You're limited only by your imagination and your personal boundaries of good taste."

Tuition is \$625, clear pine included. For more information about the school, call toll-free (888) 387-9762, or visit its Web site (www.northhouse.org).

—M.V.

Notes and Comment

We welcome news stories, anecdotes about the triumphs and pitfalls of woodworking, photographs of unusual work—anything that you think other woodworkers would like to know about. We pay for the material we use. Send submissions to Notes and Comment, Fine Woodworking, P.O. Box 5506, Newtown, CT 06470-5506.



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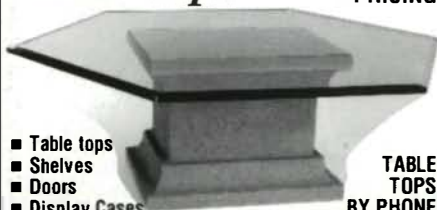
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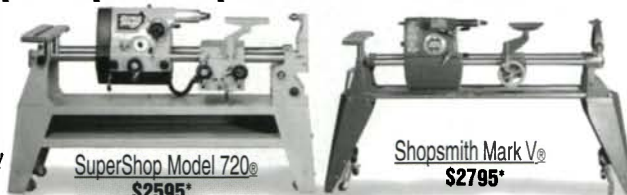
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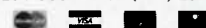
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Model	Description	List	Sale
31-695	6" Belt/9" Disc Sander	441	299
23-710	New Sharpening Center	217	169
23-680	6" Bench Grinder 1/4 HP	80	69
31-460	4" Belt/Disc Sander	198	125
40-560	16" 2 speed Scroll Saw	230	155
40-540	16" var/spd Scroll Saw	249	179
11-990	12" Bench Drill Press	255	184
11-990	32" Bench Drill Press	405	279
43-505	1/2" Bench Router/Shaper	398	299
22-540	12" Bench Top Planer	329	229
28-195	10" Band Saw	390	309
22-560	12-1/2" Bench top Planer	395	299
36-965	Versa Feeder Stock Feeder	249	199
36-220	10" Compound Miter Saw	294	199
28-185	Bench Band Saw	213	168
36-240	NEW 10" Sliding Compound Miter Saw	589	439
37-070	6" v/spd Bench Jointer	351	265
14-650	Hollow Chisel Mortiser	380	239
33-990	10" Radial Arm Saw	991	719
36-905	30" Unifence	344	255
36-906	50" Unifence	446	325
17-900	16-1/2" Floor Drill Press	490	399
37-190	6" Deluxe Jointer	603	445
36-285	8-1/4" Builders Saw w/ stand	268	189
36-210	10" Compound Miter Saw	344	219
34-555	Sliding Table	487	289
36-250	10" Slide Compound Saw	825	489
31-780	Oscillating Spindle Sander	253	194
46-700	12" Wood Lathe	575	465
34-444	10" Contractors Table Saw	586	415
34-445	10" Contractors Table Saw with 30" unifence	Sale	839
28-275	14" Band Saw 3/4 HP	Sale	595
28-280	14" Band Saw 1 HP motor with enclosed stand	Sale	739
28-280Z	14" Band Saw 1 HP w/ 50-274 mobile base, 28-843 rip fence, & 28-266 block blocks	Sale	839
40-650	30" 18" Scroll Saw	Sale	479
22-675	DC380 15" Planer	Sale	1175
31-280	Sanding Center w/ stand	Sale	789

NEW Single Stage Dust Collectors			
50-840	1 HP, 650 CFM	270	225
50-850	1-1/2 HP, 1200 CFM	Sale	309
50-851	2 HP, 1500 CFM	Sale	455

MILWAUKEE TOOLS			
6527	NEW Sawzall with case	343	169
6537-2	6527 w/quick lok blade change	224	175
0407-2212V	Drill w/kyls chuck&2 batt	380	175
0224-1	3/8" Drill 4.5 amp magnum	236	132
0234-1	1/2" Drill 4.5A mag 0-850 rpm	255	134
0235-1	1/2" Drill w/keyless chuck	255	142
0244-1	1/2" Drill 4.5A mag 0-600 rpm	255	134
0222-1	3/8" Drill 3.5 amp 0-1000 rpm	213	119
0228-1	3/8" Drill 3.5 amp 0-1000 rpm	207	109
0375-1	3/8" close quarter Drill	255	148
0379-1	1/2" close quarter Drill	288	165
0546-1	cdls Scrdwdr 200 & 400rpm	150	89
0547-1	6546-1 w/bits, 1/4" chuck & cs185	108	89
5399	1/2" D-hdle Hammer Drill Kit	356	219
5397-1	3.8" v/spd Hammer Drill Kit	275	145
5371-1	1/2" w/ spd Hammer Drill Kit	360	194
3107-1	1/2" w/ spd right angle Drill Kit	141	234
3300-1	1/2" w/ spd right angle Drill	378	219
6142	4-1/2" Grinder w/cse & a.c.c.	224	129
6490	10" Miter Saw	496	265
6491	6490 w/ carbide blade & bag	594	328
6494	10" Compound Miter Saw	585	315
6266-6	Top Handle Jig Saw	315	159
6496	10" Slide Compound Saw	1050	569

FREUD CARBIDE TIPPED SAW BLADES			
Item	Description	Teeth	List Sale
LU72M010	Gen Pur. A.T.B. 10"	60	42
LU82M010	Cut-off 10"	60	93
LU84M011	Comb 10"	50	78
LU85M010	Super Cut-off 10"	80	115
LM72M010	Ripping 10"	24	69
LU73M010	Cut off 10"	60	84
LU87M010	Thin Kerf 10"	24	72
LU88M010	Thin Kerf 10"	60	88
LU98M010	Ultimate 10"	80	128
LU19M010	Compnd Miter 10"	60	88
F410	Quiet Blade 10"	40	95
TK303	7-1/4" Finishing	40	38
SD308	8" Dado - Carbide	230	119
SD508	8" carbide w/case & shims	344	168
FB100	16 piece Forstner Bit Set	338	194
94-100	5 pc. Router Bit Door System	320	169
FT2000E	Plunge Router	Sale	205
FJ805	Top Hdl Jig Saw	Sale	99
JS102	Biscuit Jointer	Sale	125
TR215	8-1/4" Miter Saw	Sale	249

HITACHI TOOLS			
CF8B2	8-1/2" Slide Compound Saw	1169	449
C10FS	10" Slide Compound Saw	1627	699
C15FB	15" Miter Saw	1346	645
NV45AB	Col Roofing Nailer	935	379
C10RA	NEW 10" Table Saw	632	319

MAKITA TOOLS			
Model	Description	List	Sale
5090DW	3-3/8" Saw Kit 9.6 volt	280	155
DA391D	3/8 angle Drill 9.6V	166	114
DA391DW	3/8" angle Drill Kit 9.6V	341	189
ML900	Incandescent Flashlight 9.6V	14.95	

6095DWE9.6	12V Drill Kit w/2 batt..	Sale	125
6095DWLE2	6095DWE w/flashlight..	Sale	139
6095D	6095DW Drill only & cse	Special	65
632007-4	9.6 volt Battery		47
632002-4	7.2 volt Battery		39
6203DWAE	9.6V 3/8" Dril Kit w/2 batt	351	159
6211DWH	12V 3/8" Drill Kit w/2 batt	368	175

CORDLESS DRILLS			
6213DWAE	12V 3/8" Drill Kit	325	169
6233DWAE	14.4V 3/8" Drill Kit	358	205

WITH 2.0 AMP HIGH CAPACITY BATTERIES			
9900B	3"x21" Belt Sander w/bag	347	179
9924DB	3"x24" Belt Sander w/bag	360	189
19100B	3-1/4" Planer with case	263	142
7912B	4-3/8" Planer	352	199
N9514B	4" Disc Grinder 4.6 amp	118	65
DA3000R3/8"	Angle Drill	355	185
2708W	8-1/4" Table Saw	637	295
6405	3/8" Drill Rev. 0-2100 rpm	115	65
6013BR	1/2" Drill Rev. 6 amp	270	159
9401	4" x 24" Belt Sander w/bag	458	235
5007NBK7-1/4"	Circ Saw w/ case	250	125
LS1011	10" Slide Compound Saw	995	429
LS1211	12" Slide Compound Saw	1620	729
3901	Plate Joiner Kit	376	209
3612C	3 HP Plunge Router	492	269
LS1040	10" Cmpnd Miter Saw	460	259
LS1013	10" Dual Compound Slide Miter Saw	1088	599
BO5010	5" Random Orbit Sander with dust pickup	142	72
LS1220	NEW 12" Compound Miter Saw	379	

SENCO AIR NAILERS			
SNF1-	Finishing Nailer 1 - 2" w/ cs448	299	165
SN325	Nailer 1-1/8" - 3-1/4"	665	365
SLP20	Pinner w/cs 5/8 - 1-5/8"	422	229
SKS	Stapler 5/8 - 1-1/2"	390	279
SN70	Framing - Clip Hd 2 - 3-1/2"	725	449
SN65	Framing - Full Hd 2 - 3-1/2"	790	389
SN800	NEW Framing 2 - 3-1/2"	699	365
SNF40	Finish Nailer 1-1/4 - 2-1/2"	569	349

NEW Accuact Nailers by SENCO			
A100LS	Finish Stapler 1/2" - 1"	180	119
A150LS	Finish Stapler 1/2" - 1-1/4"	220	149
A15BND	Nailer 5/8" - 1-1/4"	160	99
A200BN	Brad Nailer 5/8" - 2"	215	139

BOSTITCH AIR NAILERS			
Model	Description	List	Sale
NB05-1	Stick Nailer	Super Sale	339
RN45	Coil Roof Nailer 3/4 - 1-1/4	484	369
NG0FN-2K	Finishing Nailer w/ case	557	275
BT35-2K	Brad Tacker 5/8" - 1-3/8" with case, oil, & brads	279	125
CWC100	1 HP Pancake Compressor	440	305
MILFS	Flooring Stapler 1/2" gauge	902	529
S32SX-1K	Finish Stapler 1/2" - 1-3/8" with case & oil	269	145

JORGENSEN ADJUSTABLE HANDSCREWS			
Item#	Length	List	Box of 6
#0	8"	4-1/2"	20.35 12.10 66.85
#1	10"	6"	23.30 12.90 71.95
#2	12"	8-1/2"	26.75 14.90 83.95
#3	14"	10"	33.85 18.55 105.75

PONY CLAMP FIXTURES			
Model	Description	List	Sale
50	3/4" Black Pipe	15.45	85.50 92.50
52	1/2" Black Pipe	12.65	6.95 74.95

PANASONIC CORDLESS			
EY6100FQKW	12V 3/8" Drill kit w/ 2 Ironman batteries, 15 min. charger, & case	379	179
EY6101FQKW	12V 1/2" Drill w/ 2 Ironman batteries, 15 min. charger, & case	324	199
EY6230FQKW	NEW 15.6V Drill Kit with 2 Ironman batteries, 30 minute charger & case	425	215
EY3503FQKW	NEW 5-3/8" 12V Wood Cutting Saw Kit	500	299

BIESEMEYER FENCES			
B-50	50" Commer. Saw	443	325
T-SQUARE 52	52" Homeshop	360	275
T-SQUARE 40	40" Homeshop	335	255
T-SQUARE 28	28" Homeshop	335	245

SIOUX TOOLS			
8030	3/8" var/spd Drill	263	165
8000	3/8" var/spd close qtr Drill	211	135
690	5" Air Random Orbit Sander	228	138
790VU	5" Sander w/ Venturi vacuum	313	179

STABILA LEVELS			
25010	10" die cast Torpedo Level	43	29
24640	24" Level w/ hand holes	62	43
24670	48" Level w/ hand holes	79	50
24610	48" Level w/ angle setter	80	59

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DEWALT TOOLS			
Model	Description	List	Sale
DW309KNEW	Recipro Saw 10 amp	318	169
DW378GNEW	7-1/4" Framer's Saw	210	169
DW222	3/8" Drill, 0-1200 rpm, 6.7 amp	184	99
DW231	1/2" Drill, 0-850 rpm, 7.0 amp	240	129
DW236	1/2" Drill, 0-950 rpm, 7.8 amp with keyless chuck	264	149
DW124K	1/2" right angle Drill	590	339
DW321K	Top Handle Jigsaw Kit	300	164
DW364	7-1/4" Circ. Saw w/trake	294	162
DW610	1-1/2" HP 2 handle Router	266	152
DW411K	1/4 sheet Palm Sander w/ cse	588	58
DW682K	Biscuit Joiner with case	448	199
DW705	12" Compound Miter Saw	734	359
DW625	3 HP v/ spd Plunge Router	Sale	279

DEWALT CORDLESS DRILLS			
DW952K-2	3/8" v/spd w/ two 9.6V XR batteries	284	129
DW972K-2	3/8" variable speed w/ two 12V XR batteries	362	182
DW972KQ-2	Above drill kit with 15 minute charger	Sale	229
DW904	12 volt flashlight	24.95	
DW991K-2	3/8" variable speed w/ two 14.4V XR batteries	415	209
DW991KQ-2	Above drill kit with 15 minute charger	Sale	245
DW994KQ	1/2" variable speed w/ one 14.4V XR batteries	458	239

DEWALT 18 VOLT CORDLESS TOOLS			
DW993K	Recipro Saw Kit	520	269
DW993K	1/2" Drill Kit	428	229
DW997K	1/2" Drill/Hammer Drill Kit	454	249
DW996K	5-3/8" Saw Kit	458	249
DW995KS-2	DW995K Drill, DW936 Saw and case	Sale	385
DW991KC-2	DW991K 14.4V drill kit, DW937 14.4V recip saw & case	375	
DW995KC-2	DW995K 18V drill kit, DW938 18V recip saw, & case	395	
DW997KC-2	DW997K 18V drill kit, DW938 18V recip saw, & case	415	

DEWALT BENCH TOP TOOLS			
DW708	12" Dual Compound Slide Miter Saw	Sale	649
DW788	20" Scroll Saw	Sale	469
DW733	12" Planer	Sale	435
DW744	10" Portable Table Saw	Sale	499
DW756	NEW 6" Bench Grinder	164	75
DW758	NEW 8" Bench Grinder	184	115

BOSCH			
Model	Description	List	Sale
1587VS	Top Handle "CLIC" Jig Saw	292	139
1587AVSC	1587VS 50th Anniversary saw with case	Sale	149
1584VS	Barrel "CLIC" Jig Saw	288	139
Bosch Metal	Case for above Jig Saws	24	
Bosch	30 blade assortment for Jig Saws	28.99	

1584VS or 1587VS			
with steel case and 30 Bosch blades	Sale	175	
1295DH5	Random Orb Palm Sndr.	145	89
1274DV5	3"x21" v/spd Belt Sander	301	175
1278VSK1	1-1/2"x12" Belt Sander	218	129
1275DV5	3"x24" v/s Belt Sndr.	379	214
1276DV5	4"x24" v/s Belt Sndr.	408	229
1194VSR12"	v/ spd Hammer Drill	272	155
1194VSRK	above Drill w/ case	303	169
1604A	1-3/4 HP 2 Handle Router	269	142
1613EV5	2HP v/s Plunge Router	369	199
1615EV5	3 HP v/s Plunge Router	536	305
1634VSK	Recip Saw 10.5 amp	335	185
3315K	12V Throat Drill Kit	345	179
3615K	14.4V Drill Kit	354	174
3107DVS	5" Random Orbit Sander	165	98
3107DVS	3107DVS with case	195	115
3725DVS	5" Random Orbit Sander	256	149
3727DVS	6" Random Orbit Sander	266	154
B3915	10" Slide Compound Saw	1050	559
11224VSR	7/8" SDS Rotary Drill	404	229
1703AEVS	5" Grinder - 8.5 amp	245	139

PORTA NAILER			
401	Porta Nailer complete.....	295	209
501	Face Nailer complete.....	295	209
DAVID WHITE			
LP6-20	Sight Level package - 20x.....	329	215
LP6-20XL	LP6-20 w/9056 tripod & 7620 rod		
			269
L78-300	Level Transit - 26x.....	739	489
L78-300P	above Level w/ optical plumb869		589
L76-900	Level Transit - 20x.....	419	279
ALT6-900Auto	Level - Transit -18x.....	666	455
ALT76-900	above Level with tripod &		
			799
AL8-22S	Automatic Level - 22x.....	583	295
AL8-26S	Automatic Level - 26x.....	854	325

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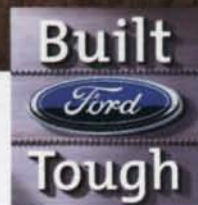


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Jacobs revolutionizes routing with the wrenchless router collet



No more wretched wrenches. With the Jacobs Chuck Manufacturing Co.'s router collet, a pull on the outer sleeve releases the bit. When the outer sleeve is locked in place, the bearings ensnare the split collet, locking the bit in place.

The Jacobs Chuck Manufacturing Co.'s wrenchless router collet, due out this summer on a line of Skil routers, will do for routing what the company's keyless chuck did for portable drills. Once you use one, you'll be spoiled. The collet, which was still without an official name at this writing, will end the hassle of misplaced wrenches and speed-up bit changes.

The chuck consists of a segmented collet surrounded by ball bearings and a locking sleeve. The device is slightly larger than a typical router collet. Removing a bit requires a firm tug on the sleeve, which releases tension on the collet. To lock a bit in place, the sleeve is pushed back, and the internal bearings exert clamping force on the collet.

Although the Skil routers with the wrenchless collet system were still in production, I did get my hands on a prototype 1/2-in. collet attached to a 15-amp industrial router. I locked a 3/4-in.-dia. dovetail bit in the collet and cut several sliding dovetail slots in hickory. I made multiple passes at various depths, up to 1/2 in. deep at a time.

I measured the bit's exposure from the collet before and after running the router. The bit stayed put (measured to within 1/32 in.) and didn't slip in normal use. I real-

ly had to abuse the machine by plowing away at too fast a rate, which caused the bit's Teflon coating to burn off and bog down the machine, before there was any slippage. The bit's shank was only slightly scored, and the depth setting hadn't changed measurably.

I discovered one problem with the prototype collet. If it gets covered with sawdust, as might happen when using the router inverted in a table, it can clog, making it impossible to snap the sleeve into a locked position. But a blast of compressed air quickly resolves the problem. Unlike standard collets, the wrenchless collet cannot be disassembled for cleaning.

Skil is expected to be the first router manufacturer out of the gate with the 1845-02 variable-speed, 2-hp plunge router (about \$125), which comes with a 1/4-in. wrenchless collet. Porter-Cable is expected to be next with a redesigned 2 1/2-hp router equipped with a 1/2-in. collet.

Jacobs Chuck Manufacturing plans to offer aftermarket chucks to fit some existing routers later this year, and the company plans to price them under \$50. We will take a closer look at production models when they become available.

—Anatole Burkin

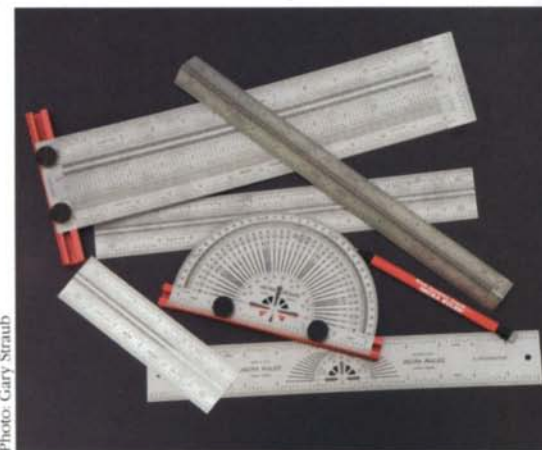
Incra rules improve accuracy of layout

Ill-fitting joints often can be traced to inaccurate layout marks. That's especially true when you try marking off increments as small as 1/32 in. or fractions of degrees using ordinary rulers or protractors.

The Incra rules, made by the Taylor Design Group Inc., make it easier to mark stock accurately because the rules have holes and slots cut at graduated marks. To make a layout mark, push the lead of a 0.5mm mechanical pencil through a hole or slot.

Several measuring products are available from Taylor Design Group, and I have used them all. The tools include straight rules, an L-shaped rule, a T-rule, a centering rule, a protractor with an edge guide and mechanical pencils.

The L-shaped rule is bent at 90° along its length. The rule has graduations on both sides of the bend and on the bend itself. This allows for accurately making a face



Tools for layout. Incra's line of precision measuring devices includes T-rules, flat rules, corner rules and a protractor.

and an edge at the same time. This is much easier than trying to align one mark with a square, trying to find the right light and hoping that the two lines meet.

The T-rule, which is dead-on accurate, has an adjustable and removable fence. It combines the qualities of a hook rule and a marking gauge by allowing precise marks to be made from the edge of the work. You can also draw parallel lines along a straightedge by sliding the rule and keeping the point of a pencil pressed

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Tools & Materials (continued)

through one of the rule's holes.

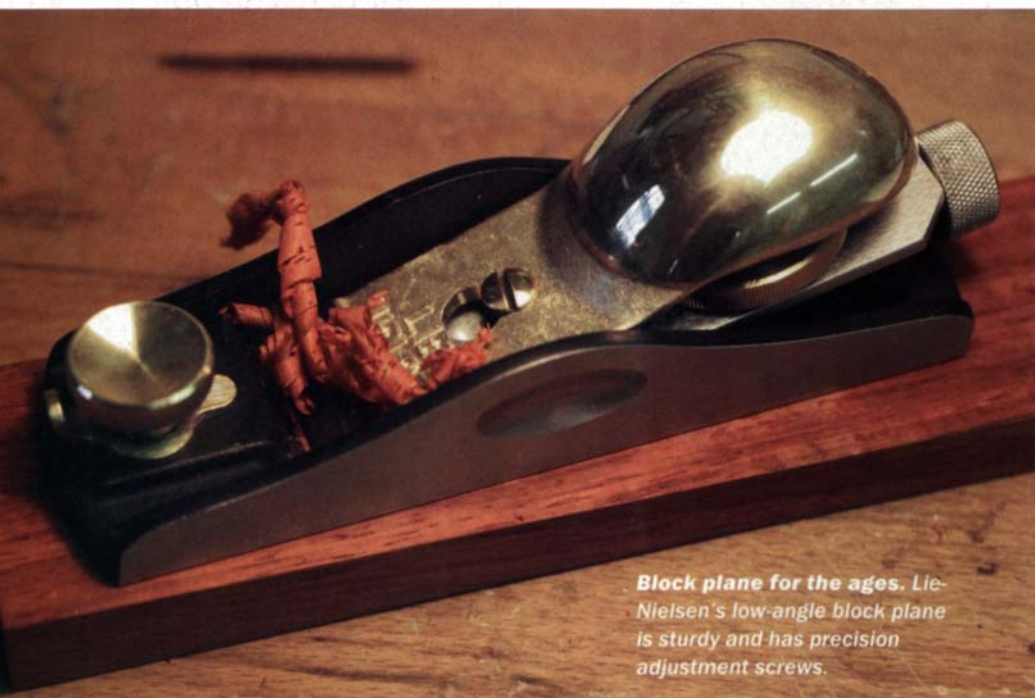
The protractor has the same fence setup as the T-rule, allowing angles to be marked from the edge of the workpiece. The center mark for the protractor is precisely aligned with the edge of the fence. There are graduations for every half degree. There is also a centering rule on the bottom or straightedge of the tool.

All the rules are graduated in increments of $\frac{1}{32}$ in., and the T-rule has $\frac{1}{64}$ in. increments. They are made of thin (0.013 in.,

by my measurements) stainless-steel sheet stock with a satin finish.

Most of the rules are available in 6-in., 12-in. and 18-in. lengths; the protractor comes in one size, a 6 in. radius; and the centering rule is 12 in. long. There is also a 3-in. pocket rule available. Prices range from \$9.95 for the 3-in. pocket rule to \$44.95 for an 18-in. T-rule. Taylor also sells 0.5mm lead mechanical pencils. For more information, call Taylor Design Group (972-418-4811).
—Gary Straub

Lie-Nielsen low-angle block plane with an adjustable mouth



Block plane for the ages. Lie-Nielsen's low-angle block plane is sturdy and has precision adjustment screws.

If a woodworker's toolbox is stocked with just one handplane, it's probably a block plane. These planes are used to fit doors and drawers, shave pegs, trim veneer and laminates, fair joints, even sharpen pencils. Because they do so much, they're the single most popular handplane, outselling all others by a ratio of 6-to-1.

Lie-Nielsen has just expanded its line of block planes with a low-angle, adjustable-mouth model. Like the Stanley No. 60 $\frac{1}{2}$ block plane, which is still made, the Lie-Nielsen comes with a $1\frac{3}{8}$ -in.-wide iron set at 12°. There are, however, some important differences. The Lie-Nielsen weighs 1 lb., 8 oz., 20% more than the Stanley. This additional weight helps reduce chatter, which sometimes affects lightweight planes.

The iron-adjusting screw on the Lie-Nielsen turns smoothly, without any slop, allowing for precise, minute, depth adjustments. The plane doesn't have a lateral-adjustment lever for the iron, but it's not necessary because the iron nests squarely in place. The only drawback is that you have to be careful not to introduce a skew to the iron when sharpening it. The back end of the lever cap makes a comfortable palm-sized handle. A compass lever located at the front of the plane adjusts the opening of the throat. The plane costs \$150 and can be ordered from Lie-Nielsen Toolworks (800-327-2520).
—Mario Rodriguez

Set dado widths with a twist of the wrist



Dial Freud for a dado. Freud's Dial-a-Width dado does away with the nuisance of shims.

Under the lid of the plastic case housing my old Sears dado set is a ratty stack of paper shims, the accumulation of many second and third tries at getting dado joints that fit. Whenever a groove needs to be widened by a whisker, I cut a little paper doughnut and insert it on the tablesaw arbor between dado blades and chippers. It may take more than one try to get it right, and these slow adjustments by guesswork are a pain in the neck.

Freud speeds up the process considerably with its Dial-a-Width dado, which can be fine-tuned without so much as removing the arbor nut. The 8-in., carbide-tipped set consists of inner and outer blades, one $\frac{3}{32}$ -in. chipper and four $\frac{1}{8}$ -in. chippers. Widths from $\frac{1}{4}$ in. to $\frac{13}{16}$ in. are possible with various combinations of blades and chippers. Somewhat similar in design to the DML Thoroughbred dado set (for a review, see *FWW* #119, p. 90), the Freud dado can be adapted to either right- or left-handed arbors.

At the heart of Freud's system is an adjustable outer blade. A large knob moves a plate on the blade's inside face, increasing or decreasing the width of cut, just the

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way adding or subtracting paper shims would. Each click of the knob changes the cut by 0.004 in.

One big advantage the Freud dado has over using shims is that the cut can be made narrower as well as wider. Directions that come with the Freud dado set, which could be more explicit about this, tell you what combination of chippers you'll need for the width you want, plus the number of clicks needed to bring the dado up to its full, nominal width.

Freud's dado set cuts very clean, flat-bottomed dados and rabbets, even in splintery woods and plywood. The biggest disadvantage is the \$250 price tag. For a distributor, call Freud (800-334-4107).

—Scott Gibson

Hand-sanding block uses belts made for power tools

Frustrated by sandpaper that often developed tears when used in hand-sanding blocks, woodworker Marv Beloff did something about it. He came up with the SandDevil, a thermoplastic rubber sanding block that uses sturdy cloth-woven belts made for power sanders. The SandDevil compresses to allow easy removal of standard 3-in. by 21-in. belts. Detents on the tool's edge make a comfortable grip. The SandDevil, sold by the Beloff-Pappas Co. (800-974-3557), costs \$19.95.

—A.B.



Hand-sanding block. The SandDevil uses 3-in. by 21-in. abrasive sanding belts.

Superabbet router bit from Amana



Heavy-duty rabbeting bit. Amana's Superabbet router bit uses rub collars of different sizes that fit over the bit's bearing.

After using a Superabbet in your router, you'll never want to go back to an ordinary rabbeting bit. For one, the Superabbet is a big, heavy bit with lots of carbide in an anti-kick-back design. The cutting edges are finely ground and leave a very clean surface. The bit comes with a pair of guide bearings that slip over the shaft, which provide excellent stability. But unlike other rabbeting bits that use the bearing as a rub collar, the Superabbet employs a variety of machined aluminum collars that fit over the bearings. Collars are available for 17 different rabbet sizes from $\frac{1}{16}$ in. through $\frac{3}{4}$ in., which includes five undersized plywood dimensions. The Superabbet bit sells for about \$79; a five-piece collar set costs an additional \$40. To find a distributor near you, contact Amana Tool Corp. (800-445-0077).

—A.B.

New tools unveiled at summer trade shows

Tool manufacturers will be unveiling their latest products this summer at two big trade shows: the National Hardware Show (Aug. 16-19; Chicago, Ill.) and International Woodworking Fair (Aug. 20-23; Atlanta, Ga.). Here's a sneak preview of a few of the new products.

Bosch will be showing off several new items, including something rather unusual: a motorized tenoning saw. Also being unveiled are new fixed-base routers with something long overdue: bases that can be adjusted relative to the centerline of the collet. These machines come equipped with hardwood handles. Bosch will also

introduce a jigsaw with an improved tool-less blade-changing system.

Wilke/Bridgewood will exhibit a 3-hp cabinet saw that comes with interchangeable arbors: $\frac{5}{8}$ in. (for 10-in. blades) and 1 in. (for 12-in. blades). And Powermatic is introducing a new 12½-in. portable planer and 10-in. chopsaw.

—A.B.

Anatole Burkin is an associate editor of *Fine Woodworking* magazine. Gary Straub builds custom furniture in Columbia, Mo. Mario Rodriguez is a contributing editor to *Fine Woodworking* magazine. Scott Gibson is senior editor of *Fine Homebuilding* magazine.

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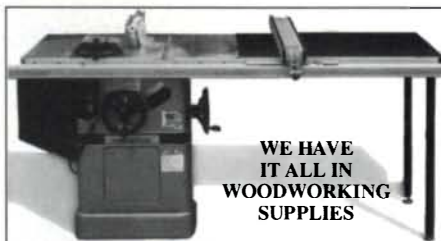


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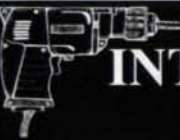
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freud

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TK406	10" X 80T THIN KERF CROSSCUT	36
TK806	10" X 80T THIN KERF CROSSCUT	47

Mahogany Bedside Table

Lay out
the table
as you make
the tapered
octagonal legs

Legs are the cornerstones of many pieces of furniture. The tapered octagonal legs on this bedside table are a little different from the ones on some furniture in that construction and milling are integral parts of the layout of the table. Unlike most furniture construction where all the parts are milled separately and then assembled, the construction of this table involves doing some of the leg milling, then using the partially milled legs as templates for the sides and back of the piece. Also, the biscuits that hold the sides and back to the legs must be cut into the legs before all the facets of the tapered octagon are milled. Don't worry; it's not as confusing as it sounds.

The octagon at the bottom of the legs is 2 in. across, and the leg tapers to a 1½-in. octagon at the top. Laying out an octagon is simple if first you draw a square. For the bottom of the leg, lay out a 2-in. square, and find its center by marking diagonal lines from the corners.

Set your compass from the corner of the square to the center. Then from the corner, swing your compass and mark a point along the two perpendicular sides that meet at that corner. Do this from all four corners of the square. You should now have two marks on each of the square's four sides, or eight marks in total. Each mark represents a corner of the octagon. Connect the marks, and there you have it.

Lay out a 2-in. octagon on the end grain of each of four 25-in.-long, 2-in.-sq. billets, and lay out a 1½-in. octagon on the end grain of the opposite ends. Accuracy is important, so sharpen your pencil for this.

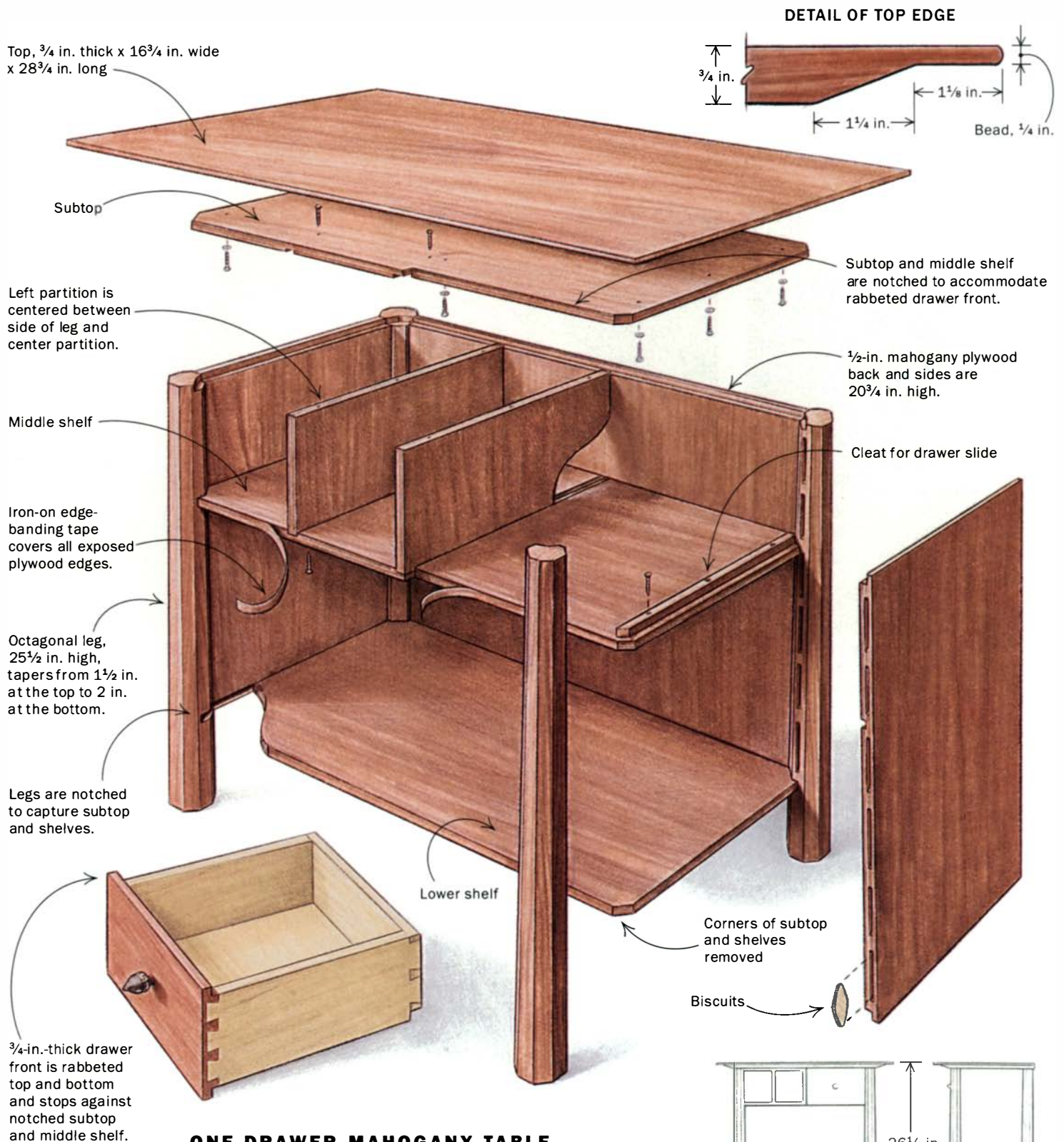
Cut a little, mark a little, cut some more

Don't think of the milling of the legs as a process of making tapered octagons. Instead, think of it in two parts: making tapered squares and then turning the tapered squares into tapered octagons. I prefer to use a tablesaw jig to cut tapered square legs, but there are many good methods for leg tapering (see *FWW* #128, pp. 60-63). I use a jointer to turn the tapered squares into tapered octagons, and then I use a handplane to dress all eight sides.

But wait! Don't go jointer and taper-jig crazy just yet. Let's take this a taper at a time because before all the tapers are cut, a par-



BY
CHARLES GRIVAS



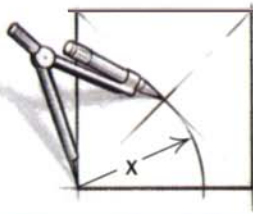
ONE-DRAWER MAHOGANY TABLE

The wide overhang of the top and the tapered octagonal legs give the table an architectural, temple-like quality. With simple modifications to the layout of the shelf partitions, the table could be built with the drawer on the left side of the table.

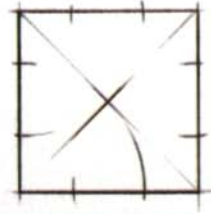
CONSTRUCTION OF THE TABLE REVOLVES AROUND THE LEG

MAKE A SQUARE INTO AN OCTAGON

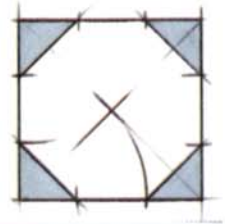
Find square's center by drawing diagonal lines. Set compass from corner to center, distance X.



From each corner, swing distance X on perpendicular sides, making a total of eight marks.



Connect eight marks to form octagon.



Leg acts as template for plywood sides and back. The author tapers one side of a leg and then holds an untapered, still-square edge of the leg against the square corners of the plywood and scribes along the leg's tapered edge.



Grooved jig centers biscuits. To cut biscuits down the center of a tapered face of a leg, the author clamps a grooved 2x2 against the perpendicular, untapered side of the leg. The depth of the groove plus the distance from the base of the biscuit jointer to the center of its blade has to equal 1 in.—the center of the leg.



A tapered square becomes a tapered octagon. After all four sides of the square leg are tapered, the author draws lines along the length of the legs, connecting the corners of the octagons he has drawn on the end grain. To remove the waste, he uses a jointer with the fence set at 45°.

tially tapered leg is used to lay out the sides and back of the table. Cut the first taper on one side of each square leg billet. The partially tapered leg will now be used to lay out the table's sides and back, and an untapered leg face will be used as a registration guide to cut biscuits in the center of the already tapered leg face.

From the drawing on p. 41, you can see that the table's rectangular footprint is 24½ in. by 14 in. and that the plywood sides and back are 20¾ in. tall. Cut a piece of plywood 24½ in. by 20¾ in. for the back. Cut the two side pieces at 14 in. by 20¾ in. Now line up a leg billet along the 20¾-in. edge of the plywood so that the tapered side of the billet faces in and an untapered side is flush with the outside edge of the plywood. Scribe a line on the plywood along the tapered side of the billet. Scribe similar lines along all the 20¾-in. edges of the back and sides.

Cut biscuits after tapering two sides

Before you do any more leg tapering, you have to cut biscuits in the already tapered side. The table's two back legs get two per-

pendicular rows of six biscuits—one row to join the leg to the back of the table and one row to join a side. The front legs get a single row of six biscuits to join a leg to a side. Centering biscuits in the facets of an eight-sided tapered leg would be almost impossible. The task is easy if you cut the biscuits now while the legs have a square face to use as a guide for your biscuit jointer. A simple grooved jig cut from a 2x2, 20¾ in. long, centers the biscuits (see the center photo above).

The depth of the groove you cut in the 2x2 is determined by your brand of biscuit jointer. What's critical is that the dimension of the jig's groove plus the distance from the bottom of your biscuit jointer's base to the center of the blade equal 1 in.—the centerline of the leg billet on the untapered side. So, for instance, if the center of your biscuit jointer's blade is ⅜ in. from the bottom of the base, then the groove you cut in the jig will equal ⅝ in. Using the jig as a fence for your biscuit jointer will let you cut slots at 1 in.

After you have grooved the 2x2 jig, mark lines for six evenly spaced biscuits. Clamp the jig to the untapered leg side that is per-



Dry-fit the legs to the sides and back, and then mark the legs for the subtop, the middle shelf and the lower shelf. A square and a razor knife ensure accuracy.



Notch the legs, not the shelves. The subtop, middle shelf and lower shelf are captured in the notches in the legs as well as in the dados in the plywood sides and back.

pendicular to the one tapered side, and using the jig as a guide for your biscuit jointer, cut the slots in the tapered leg side.

For the two back legs, taper a leg side perpendicular to the side you tapered first, and then cut the second row of biscuits, making sure to clamp the grooved jig to an untapered side. After all the biscuit slots are cut—two perpendicular rows in the back legs and a single row in the front legs—taper the remaining two sides of the legs.

It's time to turn the tapered squares into tapered octagons. Remember those octagons you meticulously laid out on the top and bottom of each leg billet? Your accurate layout will pay off. Use a straightedge and sharp pencil to scribe lines along the length of

each square-tapered billet, connecting the corners of each end-grain octagon (see the photo at right on the facing page). Once all the lines are drawn, remove the four corners of the square-tapered legs. I use a jointer with the fence set at 45° and then dress the legs with a plane. Now the legs are finished, biscuit slots already cut.

Dry-fit the case, and mark for the top, shelf and bottom

After the legs are completed, the rest is straightforward. Cut the sides and back plywood pieces along the lines you scribed with the partially tapered legs, and cut biscuits so they line up with the slots you've already cut into the legs. Cut a dado into the back and sides



THE TOP:

MILLING IT IS A MULTI-STEP PROCESS

- 1** Begin with a $\frac{1}{4}$ -in. beading bit for the top's edge treatment.
- 2** A dado blade set at an angle makes the second and third cuts.
- 3** The last cut is done with the top held upright against the table-saw fence.
- 4** A smooth plane and a rabbet plane dress the cuts.

to accommodate the subtop, the middle shelf and the lower shelf.

The next step is to dry-fit the case, using unglued biscuits to hold the sides and back to the legs. Rather than cut a precise notch in the plywood subtop, middle shelf and lower shelf to go around the four octagonally faceted legs, the legs are relieved to capture the plywood. After the case is dry-fit, use a razor knife to mark the legs for the shelf locations. You could take these measurements from the dadoed back and sides, but I find that empirically marking the exact locations is more exact. It only takes a minute, and you can check for square and possibly see any mistakes or oversights that might have occurred. After marking the legs for the three horizontal shelves, disassemble the piece and notch the legs for the shelves. Cut off the four corners of the plywood pieces, so the leg notches don't have to be cut to an exact depth.

Detailing the top

The beaded and beveled edge of the tabletop is somewhat reminiscent of a raised panel. I ran the edge treatment around the front and around both sides of the top. I left the table's back edge unadorned so that the table would fit snug to the wall next to my bed.

Molding the top is a multi-step process that uses a router with a beading bit, a tablesaw with a dado blade, an upright cut on a tablesaw and a little handwork with a rabbet plane and a smooth plane. The photos above explain the process. □

Charles Grivas builds furniture in West Cornwall, Conn.

Construction notes

The front edge of the plywood subtop and middle shelf are notched $\frac{1}{2}$ in. to allow the $\frac{1}{2}$ -in. rabbet in the $\frac{3}{4}$ -in.-thick drawer front to close flush. I used hot-glue edge-banding tape to cover the laminations on the table's exposed plywood. The tape is readily available and is applied with a clothes iron. The orange edge-trimming tool shown below is available from Constantine (800-223-8087).

The right side of the table's small drawer follows the taper of the right front leg. The taper is slight enough so that I was able to make the drawer with squared sides and then plane the edge of the drawer front to fit the leg. Trying to build a drawer with a tapered side would have been a headache, and after all the extra work involved, I'm sure I would have had to plane the drawer front anyway. —C.G.



Versatile Plywood Drawers

An honest box
with your choice
of two simple
drawer joints

BY GARY ROGOWSKI

Some drawers are built with great care, hinting at the treasures hiding behind their polished faces. They have the look and feel of a crisply tailored suit. But plywood utility drawers feel more like loose-fitting jeans: They're made for comfort and use, not for show. Utility drawers are the perfect receptacles for those minor tornadoes of odds and ends.

You can build simple plywood drawers with a tablesaw, a router and your choice of two basic joints: the rabbit or the tongue and dado. For ease of construction, build the drawers with 1/2-in. plywood (I use 9-ply Baltic birch) or a high-density particleboard. Just make sure your sheet goods are flat and of consistent thickness. Millwork then simply involves cutting the parts to length and width. Use 1/4-in. plywood for the drawer bottoms, which also serve as the drawer runners.

Construct the cabinet carcase out of the same 1/2-in. plywood used for the drawers. For a clean look, I spline-miter my cabinet



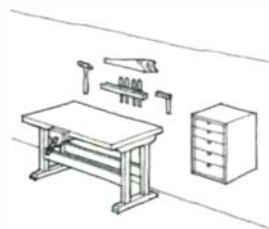
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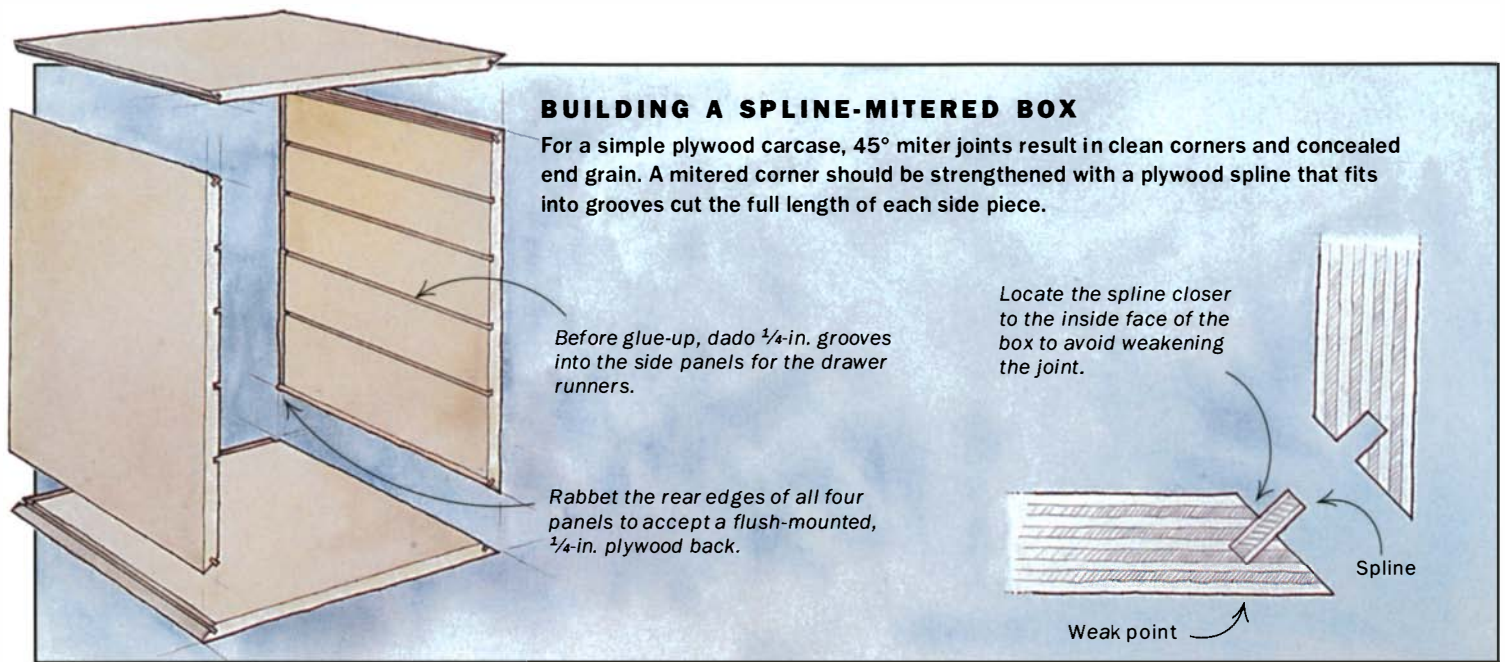
CADDY



DESK



SHOP



The tongue-and-dado joint

The simplest setup for cutting a tongue-and-dado joint requires only one bit-height setting on the router table. However, the bit hole in the table must be small enough or have a table insert to prevent the drawer pieces from diving into the hole when passed vertically over it. If your table doesn't have an insert, drill an access hole through some flat 1/4-in. plywood or hardboard, and clamp it to your table.

First cut the dados in the drawer sides. Set the bit height for the full dado cut, and then position and clamp the fence. I always take a

practice pass before committing good stock to the cut. If the dado is in the right place, the outside face of the drawer front will wind up flush with the end of the drawer side. Without changing the bit-depth setting, cut the tongues in the drawer face and back with the pieces held vertically. Score the face with a gauge line to prevent tearout. You will have to adjust the fence to get a perfect-fitting tongue.

Because the end of the dado is fragile and can break off, avoid too tight a fit, and use caution when pulling the joint apart. —G.R.



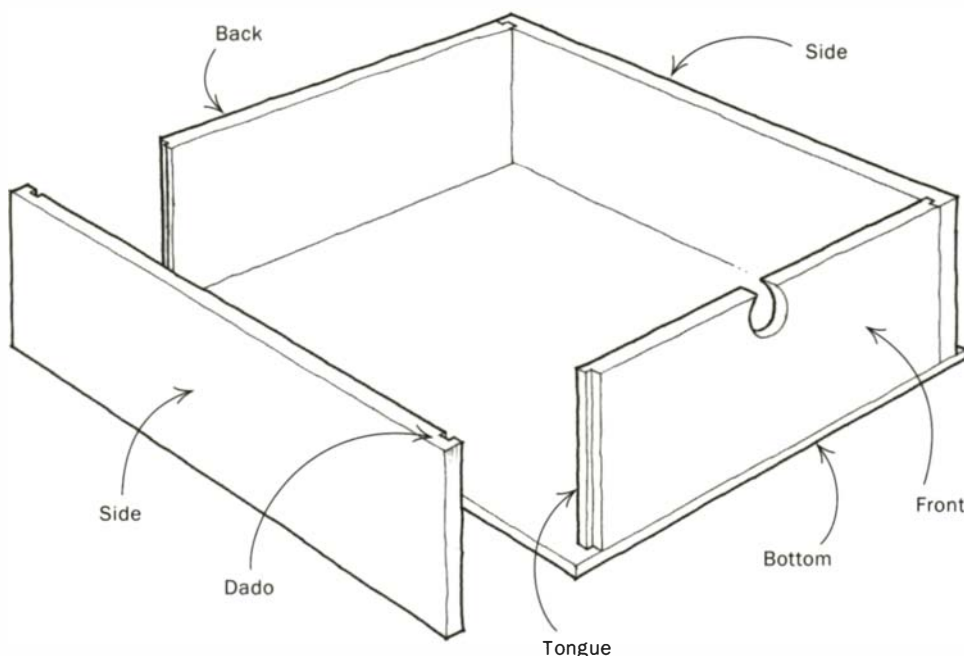
First cut the dados in the drawer sides. The dado should be one-third (or less) the thickness of the board.



Next cut the tongues in the drawer face and back. Adjust the fence for the shoulder width, but leave the bit height the same as it was for the dados. Hold the stock vertically.



Test the fit. If you cut the dado first and use it to locate the tongue, the fit should be right.



sides together, as shown in the drawing at left. I rabbet the rear edges to accept a flush-mounted, 1/4-in. plywood back, but you could rabbet the sides together and simply screw on the back. Before glue-up, dado 1/4-in.-wide grooves into the cabinet sides for the drawer runners to rest in. Make sure the case goes together square by checking the diagonals across the face and back of the cabinet. Pull the cabinet square by clamping across the longer diagonal. Squaring the cabinet will make fitting the drawers much simpler later on.

Both the rabbet and the tongue and dado are excellent joints for plywood construction because they help line up the drawer parts when gluing. The difference between these joints is partly structural and partly visual. The tongue and dado shows the ply edge on the face of the drawer, whereas the rabbet keeps this edge hidden from sight. But the rabbet needs fasteners such as dowels or nails to resist being pulled apart every time the drawer is yanked open. Because the tongue of the drawer front is secured by the dado of the drawer side, the tongue and dado naturally resists this same movement.

You can cut either joint on a router table (see the boxes on this and the facing page). For pulls, I bore 1-in. holes in the drawer fronts with a Multispur bit or a Forstner bit, positioning the bit so that a portion of the hole overlaps the top edge of the drawer.

Glue up the drawer sides, and then glue on the bottoms. Make sure that the drawer boxes fit between the case sides with only a little slop; let the drawer bottom be the item you adjust for that perfect fit. Then comes the best moment: filling all those drawers with stuff. □

Gary Rogowski is a contributing editor to Fine Woodworking magazine.

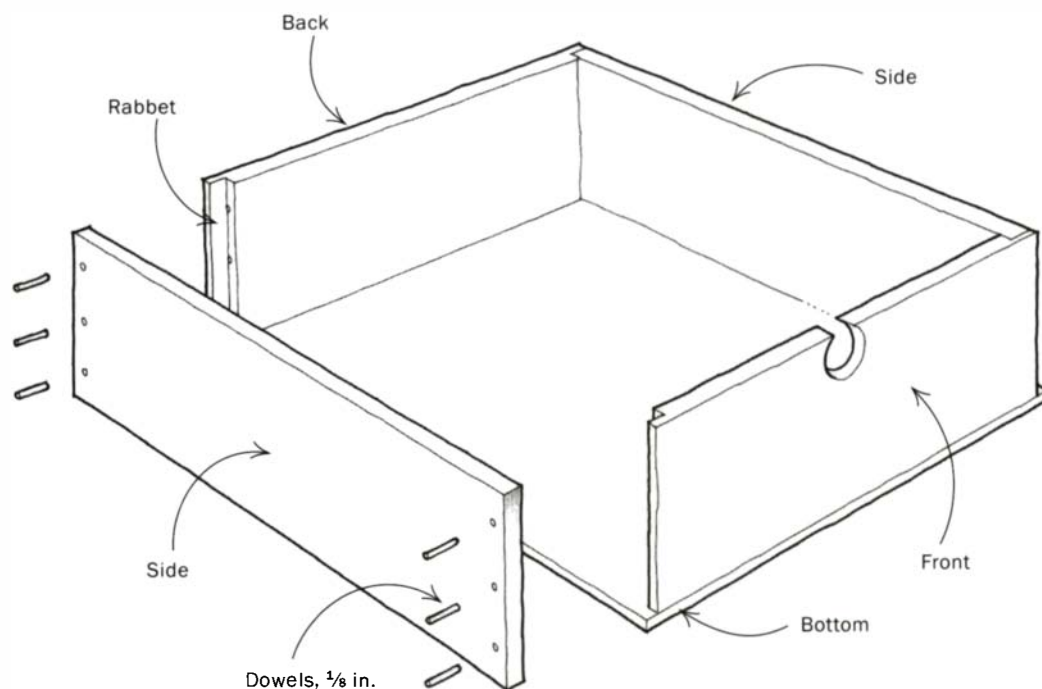
The rabbet joint

The rabbet joint requires just one router cut into each end of the drawer face and back. The drawer sides are simply crosscut to the correct length, figured by taking the outside dimension of the drawer box less the width of the rabbet on both ends. Use a router bit the same width as the drawer side, so you can cut the full width of the rabbet with each pass across the bit.

To spare your bit, take two separate passes to cut the rabbets to depth. The first pass takes away about 1/8 in. of material; the second cuts to depth, in this case, 1/4 in. A rabbet joint can also be roughed out on a saw and then router cut in

only one pass, with the bit set to full depth.

The sides on my utility drawers are about 3 in. wide. When you cut narrow boards like these on a router table, you can gang up two or three to give them greater stability against the fence and to reduce tearout. Make sure you're aware of where your fingers are when the bit emerges from the cut. After the drawers are glued up, pin the drawer sides to the face and back with 1/8-in. dowel pins. If you prefer to fasten the sides with finish nails, drive the nails at a slight inward angle, and set the nail heads. —G.R.



Gang several pieces together. Cutting two or three pieces at once improves stability against the fence and reduces tearout.



Pin a rabbet joint with dowels or nails. Fasteners keep the joint from breaking apart when the drawer is yanked open.

Putting a Finish on Small

BY JEFF JEWITT

Whether you have a handful of Shaker pegs for a coat rack or 60 door and drawer pulls for a large kitchen, finishing small items can be a tricky business. Small, irregularly shaped parts present a challenge when applying the finish, and just holding them in place can be half the battle.

Over the years, I've developed some techniques you can use for holding and finishing small items. They will speed up an otherwise monotonous task, and you will get more consistent results and avoid sticky fingers.

By pre-finishing small parts before assembling a project, you can save time and achieve a cleaner appearance in the finished job. One big benefit of pre-finishing is that you can avoid the problem of film finishes pooling up at the sharp corners where two surfaces meet, which causes drips and results in a sloppy-looking finish.

The concept of pre-finishing is simple: Finish all the parts of your project before you put it together. Be sure to protect areas—such as tenons and open mortises—that will be glued later. You can mask off areas with tape or insert round tenons into holes drilled into a scrap of wood.

The type of finish you choose and how you lay it on will either make life easy or terribly tedious. Try brushing polyurethane or shellac on two dozen door pulls using a 4-in. trim brush and you'll likely develop a headache along with a lousy-looking finish. I use different application methods—brushes, rags dipping cans and spray guns—depending on the finish.

When spray finishing, if you don't have an explosion-proof booth, do your spraying outside, away from any sources of ignition. And one great little rig to use is a scrap of plywood on a lazy Susan. You can keep the pieces moving as you spray, resulting in a more even finish. □

Jeff Jewitt restores furniture and sells finishing supplies from his shop in North Royalton, Ohio.

TRICKS FOR HOLDING SMALL PARTS IN PLACE

One of the most common methods for holding small or irregular parts is a nail board.

This is nothing more than a piece of thin plywood— $\frac{1}{4}$ in. is usually sufficient—with brads, nails, staples or dry-wall screws driven through from the other side. Nail boards allow you the luxury of finishing many sides of an object before the finish cures—speeding up the work and improving the quality of the finish.



For holding small items, place as many nails or staples as possible in the plywood scrap. This bed-of-nails effect distributes the weight of the object over many fine points, so you don't end up with noticeable marks in the finish. Round balls, small bowls and the like can be finished on one of these.

SMALL OBJECTS

CALL FOR A SMALL BRUSH

I have a hands-down favorite brush for applying a finish to small shapes—an artist's brush made by Winsor & Newton (series #580).

These brushes are made with synthetic filaments, and the delicate bristles do not hold very much finish material, which helps to avoid drips. I use a quick, slapping motion to apply the finish.



Objects Is No Little Task



RAGS ARE BEST FOR GEL FINISHES

Wiping a finish on small parts with a rag is easy and quick. This method works especially well with gel varnishes, as shown being applied to these finials.

DIPPING WORKS WELL WITH STAINS

Dipping is the best technique for staining. And for holding small objects upright on a work surface, clothespins make sturdy little clamps (see the photos at right). Any kind of stain will work using this method, but on large runs, you may experience progressively lighter staining. Fading color is more common with dye-based stains, and it's due to exhaustion of the dye in the solvent. To avoid this problem, replenish the dipping tank with more fresh stain periodically. Dipping also works if you're applying an oil finish, but you'll have to wipe off the excess with a rag.



SPRAYING ON A SMALL SCALE CAN BE SIMPLE AND CHEAP

Spraying is my preferred method for applying a topcoat to a lot of small pieces. You don't really need fancy equipment. A small compressor and a \$24 touch-up gun (see the photo at left) from Harbor Freight Tools (800-423-2567) is the rig I use most frequently for small articles.

The disposable sprayer at right costs about \$6 and comes with a glass canister to hold the finish of your choice. The sprayer delivers a finely atomized finish. You'll have to thin down most finishes designed for brushing to a consistency that will work with this sprayer.



Great Shop



in a Two-Car Garage

Economy and ingenuity make the most of a modest space

BY CURTIS ERPELDING

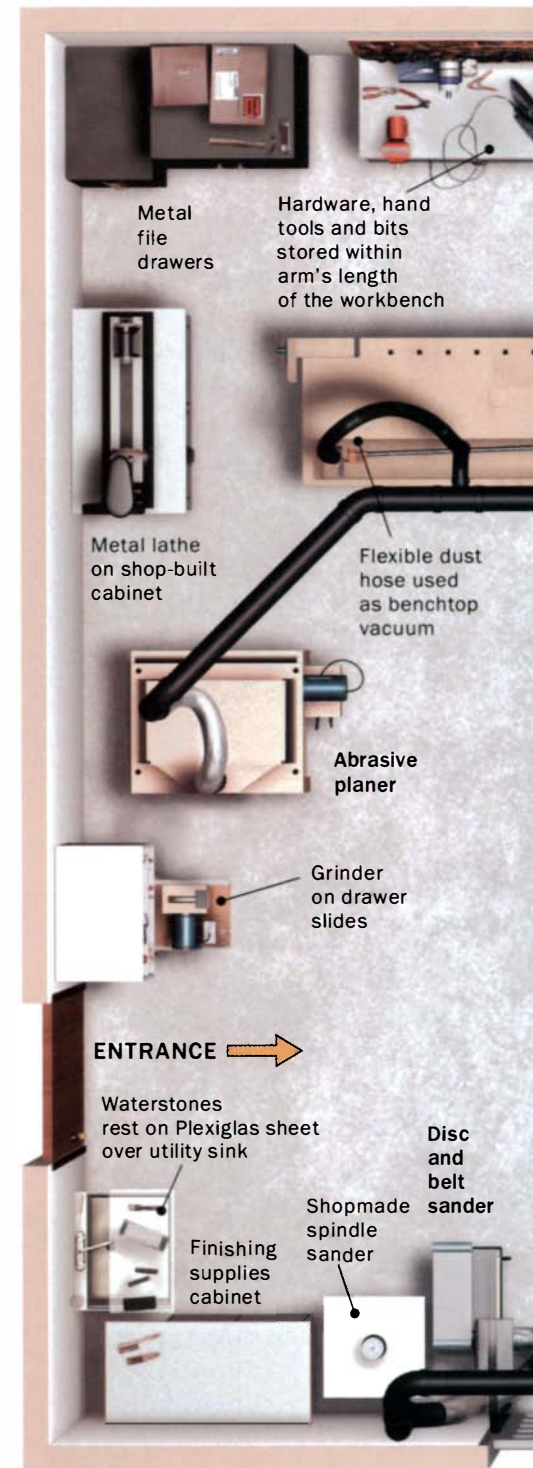
A workshop ought to be perfectly practical—just a place to work wood and to keep tools and materials dry and warm—but it never is. That's because it is also very personal. The problems you solve as you outfit your shop may be practical ones, but they arise for personal reasons: You make jigsaw puzzles as well as highboys; your shop is unheated in the winter and floods in the spring; you like to stand while drawing and sit down while cutting dovetails; you store your kayak for half the year suspended from the ceiling above your milling machines.

I've had six shops over the last 20 years, and I've found that improving a shop is a matter of learning about myself and the

way I work, both in general and in each specific space.

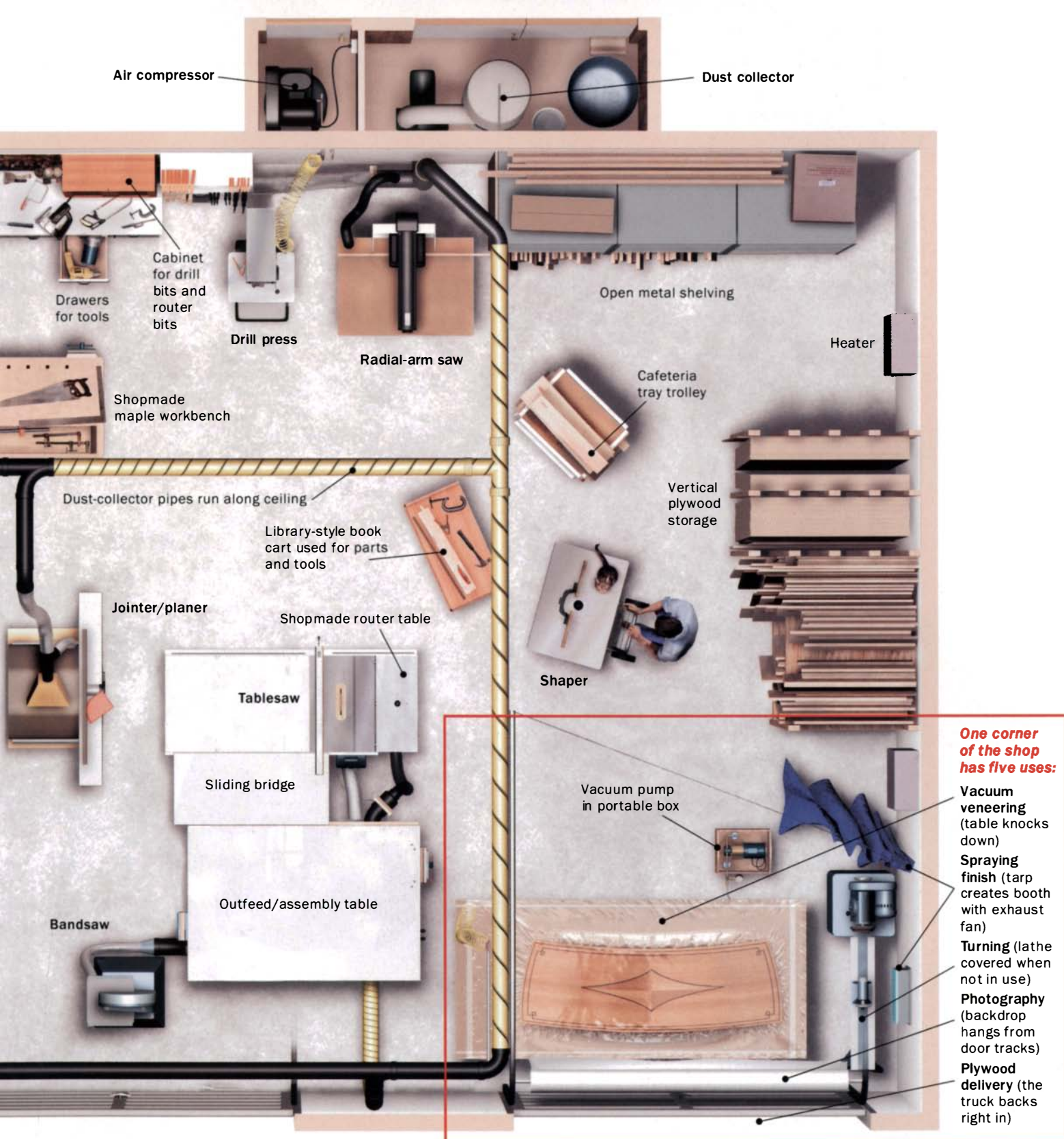
In my first shop, which was the cleared-out end of a book-storage warehouse, I hung the few tools I had accumulated on the wall a good 10 paces away from my work table. It soon became apparent that constant trips between the wall and the work table were doing nothing for my productivity. I learned a specific lesson and applied it in my succeeding shops: Store drill bits by the drill press, sawblades by the saw, hand tools by the workbench, jigs and fixtures by the machines they were built for.

I also learned a more general rule of shop design: You'll rarely get it right the first time. It takes time and experience to create



a well-functioning, efficient shop. All of the aspects of shop order—from tool and machine layout to work flow procedures and storage solutions—evolve over time.

My grinding setup is an example of Darwinism as it applies in the workshop. In that first shop, my grinding device was a hand-operated wheel clamped to the edge



of the table. It had all the disadvantages: It was slow, it took muscle, its minimal tool rest made it difficult to obtain a consistent edge and, being clamped to the work table, it was in the way. It didn't take too long to realize that if I was serious about making a living while using hand tools, I would have to find a better system.

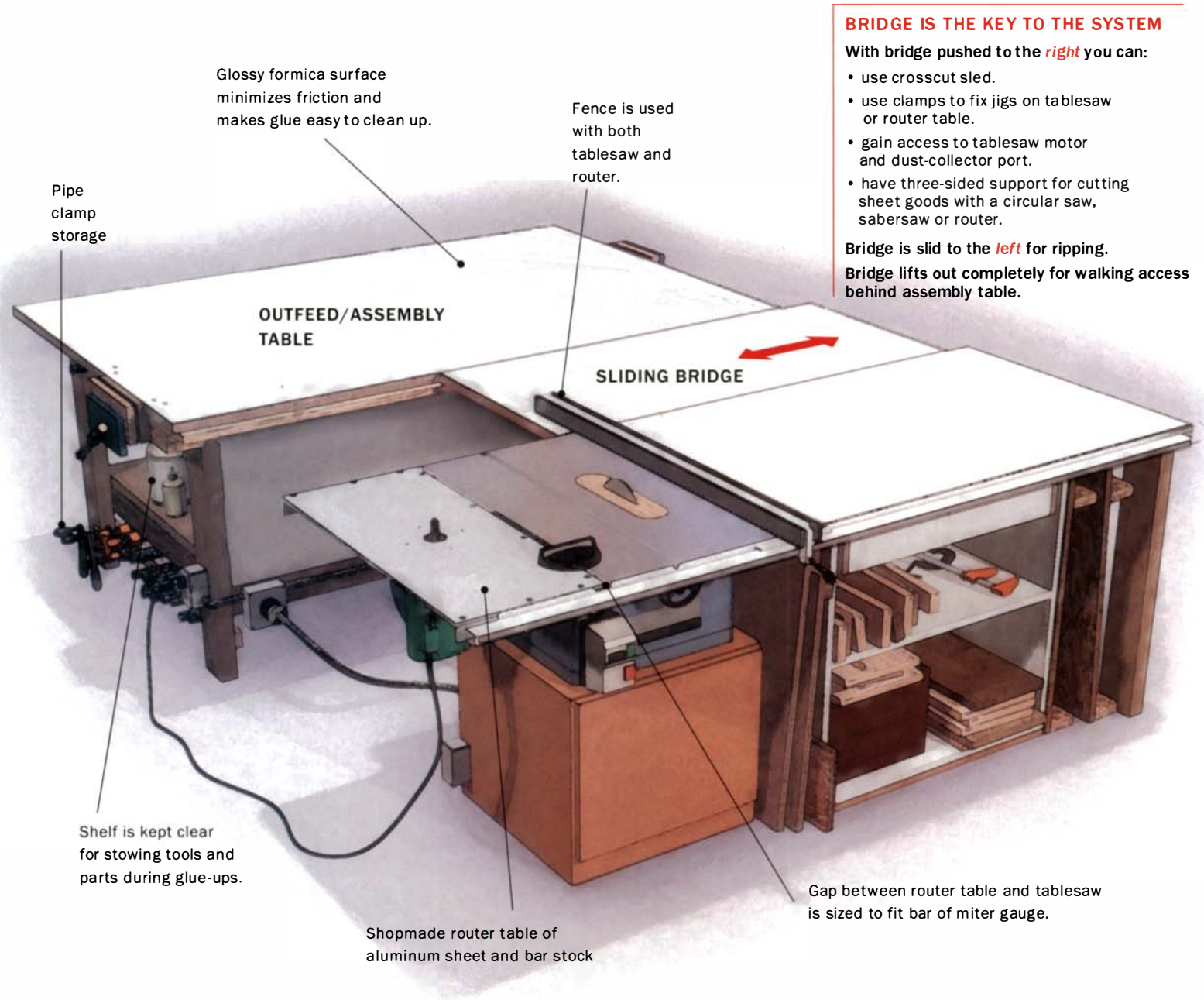
The first improvement was to motorize. I salvaged an old washing-machine motor that ran at a convenient 1,725 rpm and fitted it with a white vitrified wheel. Then I went about finding a better approach to the tool-rest problem. One drawback of most tool rests is that they don't fully support the blade being sharpened. Another problem is

that they force you to hold the tool or blade at an unnatural angle. I built a tool rest in the shape of an open-sided box around the grinding wheel. The wheel emerges through a slot in the top of the box the way a tablesaw blade emerges through the throat plate. This enables me to grind tools while they are lying flat and fully supported



TABLESAW AND ASSEMBLY TABLE LINKED AT THE HEART OF THE SHOP

With all the room a tablesaw requires for infeed, outfeed and support on either side of the blade, its placement is the logical starting point for laying out a shop. The author decided to make his outfeed table do double duty as a fixed-in-place assembly table. A sliding bridge connects the saw with the assembly table.



BRIDGE IS THE KEY TO THE SYSTEM

With bridge pushed to the **right** you can:

- use crosscut sled.
- use clamps to fix jigs on tablesaw or router table.
- gain access to tablesaw motor and dust-collector port.
- have three-sided support for cutting sheet goods with a circular saw, sabersaw or router.

Bridge is slid to the **left** for ripping.

Bridge lifts out completely for walking access behind assembly table.

Pipe clamp storage

Glossy formica surface minimizes friction and makes glue easy to clean up.

Fence is used with both tablesaw and router.

OUTFEED/ASSEMBLY TABLE

SLIDING BRIDGE

Shelf is kept clear for stowing tools and parts during glue-ups.

Shopmade router table of aluminum sheet and bar stock

Gap between router table and tablesaw is sized to fit bar of miter gauge.

on the top of the box (see the photo at left on p. 55). Even spokeshave irons and small marking knives can be precisely ground without the need for positioning fixtures. With the motor mounted on a hinged board, I can adjust the grinding angle by raising or lowering the motor. That was my second sharpening setup, permanently mounted at the end of a wall bench. My

current arrangement has the same grinder, but the box is now mounted on the wall at a comfortable height for grinding. The whole mechanism is on drawer slides and is pulled out of the box for use. This saves space but also keeps dust, debris and stray tools from ending up on the grinder.

Because everything evolves, being flexible is another inflexible rule of organiza-

tion. Try not to make any feature of the shop permanent. The arrival of new tools, new types of work or simply better ideas will demand a new arrangement.

Having machines that are movable is particularly advantageous in a small shop. In my own shop spaces, I've kept my machinery small. One of the advantages of having small, lightweight machines is that you can



IN A SMALL SHOP, MOST THINGS SHOULD BE MOVABLE



TILT AND ROLL



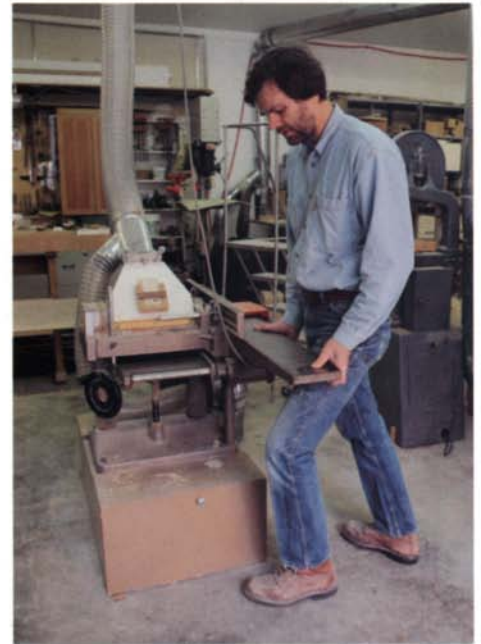
Stationary disc and belt sander has wheels just off the floor, so you can tip it back and move it like a wheelbarrow. Offset, non-swivel casters are key.



LIFT AND ROLL



A pair of non-swivel, heavy-duty casters make the shaper movable, and a pair of adjustable glides keep it level and stable. For a long move, a hand truck helps. The cat provides good ballast.



LET IT SLIDE



The jointer/planer often needs to be angled to increase feed clearance. A simple plywood box with nail-in glides at the corners makes a stable, slidable base.

easily move them, even by yourself. With my 14-in. bandsaw, for example, I don't have room for the optimal 8 ft. or 10 ft. of clearance on the outfeed side. In good weather, I increase outfeed clearance by opening the garage door. In poor weather, I simply pivot the machine. With heavier machines, I improvise. I mounted two non-swivel casters and two adjustable glides in-

side the base of my shaper. They raise the machine $\frac{1}{8}$ in. or so, without compromising its stability. I can move it short distances by lifting the side with the glides and pushing or pulling. For longer trips, I use a hand truck to lift and push the side with the glides. I could have bought a mobile base for the shaper, but I didn't want to raise the shaper significantly because I use it as a

side support when I crosscut long pieces on the tablesaw.

Because each shop presents unique problems, it makes sense to make your own shop fittings and furniture. But that doesn't mean you can't find ready-made solutions. I have an old large metal cabinet full of drawers. It was originally used for storing Addressograph printing plates, and



NEARBY DRAWERS IMPROVE THE BENCH

The author worked for years with his bench against a wall. Moving the bench away from the wall and building a cabinet with drawers behind it made him far more productive.



1 Pulled away from the wall, the bench can be used from both sides, and workpieces can extend from it in all directions.

2 With counter space and tool storage within arm's length, the workbench stays uncluttered.

3 Cabinet is used for router bits and drill bits.

4 Countertop with laminate surface and integral splash is available in various lengths at home centers. This 8-ft. section cost about \$50.

5 Deep drawers run on heavy-duty, full-extension slides and hold routers, drills, sanders and air tools.



it was free for the hauling. I spent a couple of hours modifying the drawer interiors, and it is now brimming with neatly segregated screws, sandpaper, hardware and glue. All sorts of card file cabinets are obsolete as a result of the computer revolution. The cabinets range from the fine wooden ones with dovetailed drawers that libraries used for their card catalogs to standing metal cabinets and two- or four-

drawer desktop cases.

Used office-furniture stores are a good place to haunt. Metal file-drawer cabinets in legal or letter size make fine storage for mid-sized items, and used ones can be had quite cheaply. And at a bankruptcy sale, I bought a metal storage rack for \$20 that would have cost me at least a day of labor and \$100 in materials to duplicate in wood.

Being a frugal sort, I like the idea of adap-

tive reuse. Two of my roll-around carts are sturdy aluminum trolleys that used to carry cafeteria trays. I bought them for \$50 apiece at a scrap-metal yard. I scrubbed them down and cut pieces of 1/2-in. particleboard to use as shelves where the trays once went. These 6-ft.-high carts, with their footprint of 1 1/2-ft. by 2 1/2-ft., can hold an enormous number of furniture parts that would otherwise be scattered over tables



GLIDING GRINDER

This grinder slides out of a box for use. For rigidity, two pairs of drawer slides are used: one pair side-mounting, the other bottom-mounting. The open box around the grinding wheel is the tool rest, which enables the author to grind blades while holding them flat. The blades ride on a steel wear plate. The motor mount is hinged, and changing its height adjusts the grinding angle.

SAVVY RETROFIT AND REUSE



FROM THE LUNCHROOM TO THE WORKSHOP

For \$50, the author bought an aluminum trolley for cafeteria trays. A good scrubbing and some 1/2-in. flake-board shelves turned it into a parts cart.

PUMP HOUSE

A quick plywood box, with cutout handles and a slide-in lid, makes a snug mobile home for the author's vacuum-veneering pump. When not in use, it is stored on a shelf.



REVIVE-A-VAC

The bottom half of a dead shop vacuum makes a rolling rag bin, trash can or a barrel for cutoffs. A scrap of flakeboard placed on top turns it into a utility table for mixing finishes.



or benchtops or spilling onto the floor.

Like all shops, mine is a stage for the eternal battle between order and chaos. And true to thermodynamic law, chaos has the edge. As years go by, I collect more jigs and fixtures that somehow can't be thrown out, extra material from each job begins to add up and, of course, I can't resist that extra piece of equipment. The more I try to squeeze in, the more chaos threatens to

take over. At some point, after all the space-saving devices have been deployed, the issue becomes paring back (perish the thought) or expanding the space. This spring, after working in a two-car garage for six years, I am remodeling the shop, nearly doubling the working area. I have a pretty good idea how I'll use this added space—a dedicated finishing room, a fold-up table for vacuum veneering, a place

where the lathe is more accessible. Whether these ideas will work out as planned I don't know. But I am certain that over time my needs will change, my accessories will increase, the new space will evolve to accommodate them and chaos will slowly regain its lost ground. □

Curtis Erpelding is a furniture maker living in Port Orchard, Wash.



From Rough

Using machines to remove cup, crook,

BY GARY ROGOWSKI

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

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

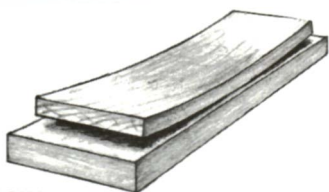
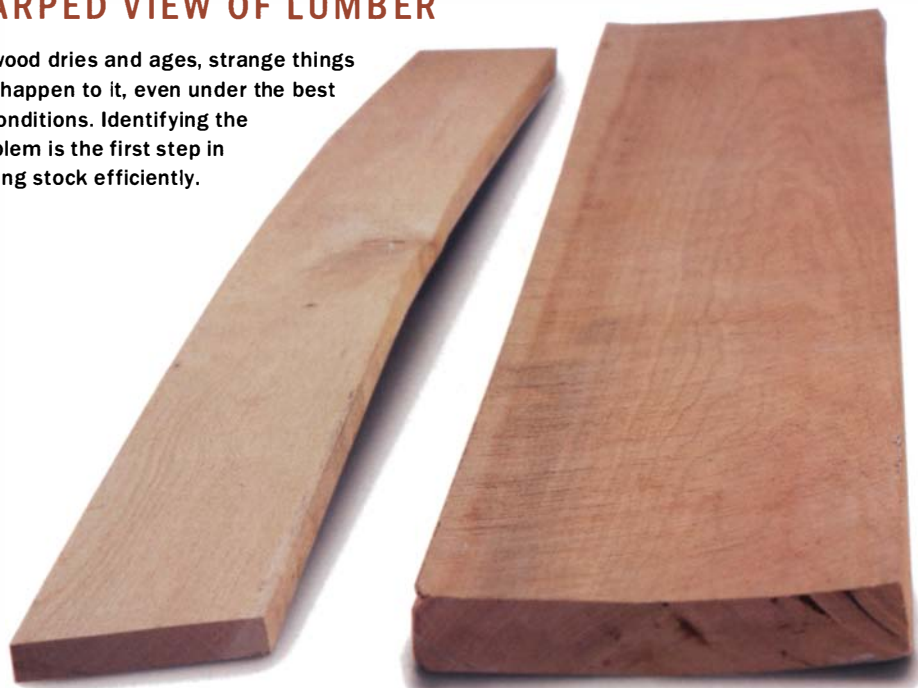
The first step in milling is looking, not machining. Examine your stock, and identify problems such as bow, check, cup and twist. Different defects call for specific

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

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

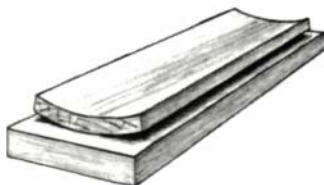
WARPED VIEW OF LUMBER

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



BOW

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



CUP

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



TWIST

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

to Finish

twist and other defects from lumber



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

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

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

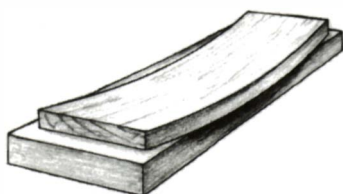
too slow, improper stickering and other mistakes—can play havoc with wood. Here are some of the more common problems and how to solve them.

Use bowed stock for short pieces

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

CHECKING

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



CROOK

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



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



BOWED LUMBER

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



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



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

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

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

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

Jointing a high spot

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

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

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

Taking the cup out of a board

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

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

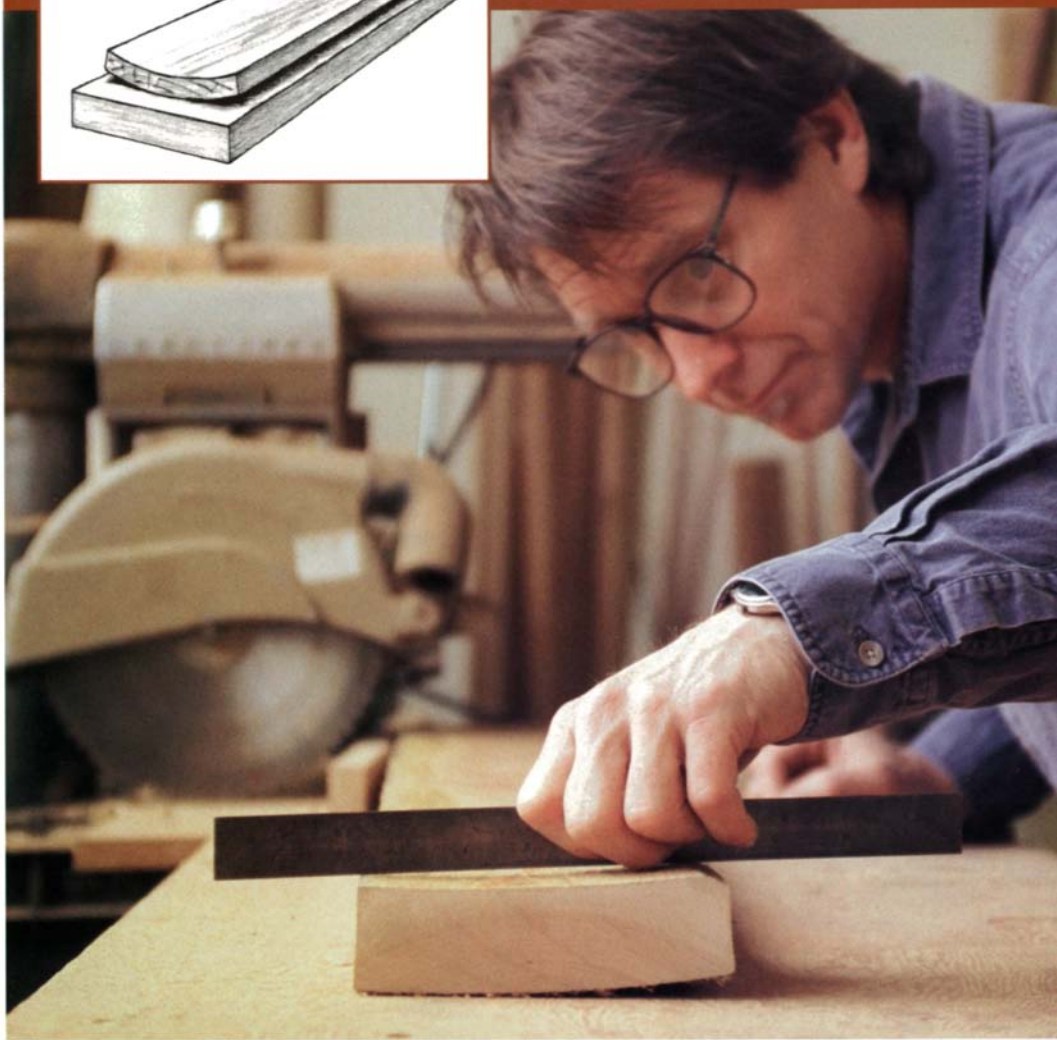
Most rough lumber has checks in the end grain

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

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

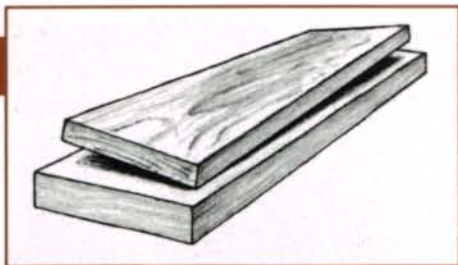


CUPPED LUMBER



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





TWISTED LUMBER

Winding sticks help identify twist



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

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



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



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



looking for a bulge on the face of a board.

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

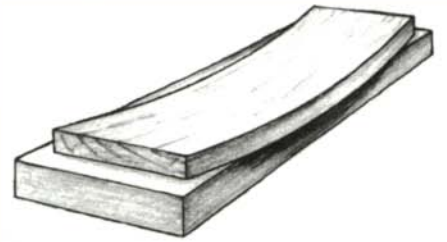
Gone with the wind

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

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

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

CROOKED LUMBER



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



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

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

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

Remove crook with a saw

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

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

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

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

Laminate Trimmers: Mini-Routers with Muscle



These small, light machines outdo their larger cousins at hinge mortising, roundovers and surface repairs

BY ANTHONY GUIDICE

Most people regard the laminate trimmer as a one-dimensional tool used solely to trim plastic laminate flush to its substrate. I almost never use the tool for that job, but I find it indispensable for other tasks. Because it's so lightweight and easy to use with one hand, a laminate trimmer is a great tool to rout for inlay, trim veneer and cut small shapes, such as a bead along the edge of a face frame.

With a laminate trimmer sitting on your shop shelf, you begin to realize that it can become the tool of choice for light-duty routing. It can be liberating not having to use your 1½-hp, 10-lb. router to round over a ¼-in.-radius profile along the edge of a shelf. I use the laminate trimmer for two common tasks—mortising hinges for cabinet doors without using a template and making quick surface repairs over knots or self-inflicted mistakes. (You're not a serious woodworker if you don't bungle a project once in a while.)

I recently had to remove a cabinet shelf that was glued in place with biscuits. I would have had to scrap the entire cabinet if I hadn't been able to repair the jagged mess that remained. By using a laminate trimmer and a few repair techniques, I was able to fix my blunder quickly and simply.

A small mortise machine scaled to fit the job at hand

To mortise hinges for cabinet doors using more conventional methods, such as with a chisel or a full-sized router, you have to pre-mortise the face frames before installing them on the cabinet. Or you have to tip the cabinet sideways on the bench. If the cabinet is very large (some uppers I recently made were 58 in. tall), these methods can be time-consuming and cumbersome. Let's face it, chiseling a mortise in a freestanding cabinet is a pain. In addition, a full-sized router will not always clear the inside of a narrow cabinet. And sometimes the base is too large to get close enough at the top and bottom of the face frame to cut the hinge mortises where they belong. Using a laminate trimmer solves many of these problems.

Start by making sure that the door is a good fit in the opening. Clamp the door in a vise, and locate the hinge. With the hinge leaf in position on the door, scribe its out-

When choosing a laminate trimmer, consider a *high-powered* model

BY SVEN HANSON

In the shop of my dreams, I plan to have 13 routers, each holding a regularly used bit. After cutting a dado, I would put the machine down and pick up another with a roundover bit or a dovetail bit and go right on working without the usual flapping around to find wrenches and bits.

Most of us have a mid-sized router for general purposes and maybe a big router for heavy-duty molding and joining. If you're thinking of harnessing another horse to the



Bosch 1608/9 trim router
Cost: about \$90

DeWalt DW 670 laminate trimmer
Cost: about \$90

Porter-Cable 7310 laminate trimmer
Cost: about \$95

team—without mortgaging the farm—three ¾-hp laminate trimmers (sometimes called trim routers) deserve consideration.

Bosch, DeWalt and Porter-Cable now sell heavy-duty laminate trimmers. These machines share some basic specs: 5.6 amps, 30,000 rpm, about 3½ lbs. of weight and ¼-in. collets. They have about the same amount of power as many small routers on the market, unlike older trimmers that came with 3.5-amp motors.

Evaluating features and performance: Laminate trimmers have precise height-adjustment screws. That comes in handy for fine-tuning the depth of cut when dadoing or cutting grooves for inlays. To adjust the height, a thumbwheel turns a threaded machine screw that moves the motor up or down.

The Bosch has the finest height-adjustment screw—32 threads per inch (tpi). An easy-to-gauge quarter turn changes the height ⅛ in. This machine also has the least

HINGE MORTISING



Cleaning up hinge mortises is a cinch. The secret to easy cleanups on routed mortises is a well-scored knife line made before routing out most of the waste.



line with a very sharp marking knife. Remove the hinge, and then scribe the lines deeper. I use an X-Acto knife to scribe the position of the lines and a regular utility knife to score them deeper.

With a mortising bit in the router, set the bit to cut the full depth of the mortise. Rout the mortise to within $\frac{1}{8}$ in. or $\frac{1}{16}$ in. of the scribed line, and

clean out the remaining debris with a chisel (see the top photos at left).

After mortising for the door hinges, transfer the hinge positions to the cabinet, and repeat the process. Be sure to wear eye protection, especially when using this tool horizontally. When the work is being done at eye level, the bit can throw chips right into your face.

If you have to mortise hinges that are larger than the width of the laminate-trimmer base—usually about $2\frac{1}{2}$ in.—rout from the outside line inward, and leave a small island ($\frac{1}{4}$ in. or so) at the center of the mortise. This acts as an additional bearing surface for the base as you rout the other side. Otherwise, the base will tip and dig out too much material. When you're done routing, you can easily chisel out that last bit of waste in the center of the mortise.

REPAIRS



Score the cutout lines more than once. Mark the mortised cutout from the actual repair piece, matching grain patterns and color as best as you can. Scored knife lines are deepened by making several passes.



Surface repairs, quick and tight

If you've damaged the surface of a workpiece or have some lumber with a loose knot that will eventually fall out, use the laminate trimmer for making quick and sound repairs. Start by making a $\frac{1}{4}$ -in.-thick repair piece from scrap material, large enough to cover the defective area (see the bottom photos at left).

I try to match the grain in color and pattern, but I keep the repair simple by making the repair piece rectangular. Although it might not be invisible, a tight, well-fitting

repair is preferable to a damaged surface or a loose knot. Also, sharp angles and complicated shapes are more difficult to mark, rout and chisel. The repair piece should have crisp edges against which to mark the cut.

Place the repair piece over the defective area, and mark it with a knife. Remove the piece, deepen the lines, rout



ROUND OVER



Small shaping jobs don't demand a lot of power. Easing sharp edges of furniture with a 1/4-in. roundover bit is a task tailor-made for a laminate trimmer. These tools will only accept bits made with 1/4-in. shanks; the author recommends not using a roundover bit with a radius larger than 3/8 in.

and then clean out the edges of the mortise with a chisel. After checking the repair piece for a tight fit, remove it, and compress all four sides by tapping the edges lightly with a steel hammer. This step makes inserting the repair piece easier, and glue will swell the compressed edges for a nice, tight fit.

Coat the entire mortise (bottom and side edges) with glue, and tap the repair piece into position with a hammer. Clamp it in place with even pressure until the glue sets; then plane and sand the surface flush. You should have a virtually seamless fit.

These techniques are fast and accurate, require no special jigs or a lot of bench work. The versatility of this little machine can add a new dimension to your wood-working projects, and if you're like me, it can save your neck sometimes. □

Anthony Guidice builds custom furniture and teaches woodworking classes in St. Louis, Mo.

(“High-powered laminate trimmers,” continued from p. 63)

amount of height adjustment: 1/2 in. The Porter-Cable and the DeWalt use 24-tpi rods, good enough for most applications. The DeWalt has a height-adjustment range of 7/8 in.; the Porter-Cable moves 1 in.

Collet depth also contributes to the absolute height capacity of a router. You can adjust the height of the cut by setting the bit higher or lower in the collet. The Bosch swallows up to 1 1/2 in. of shank. The DeWalt accepts 1 3/4 in. and Porter-Cable 1 1/2 in.

To examine performance, I mounted a sharp 3/8-in. roundover bit in each trimmer and cut cherry. Each of the routers cut the wood easily and produced a very smooth surface. That's the good side of the high rpms. But when I halted movement or slowed for a corner (with the tool running), burn marks appeared. You have to keep in mind that these motors turn about 50% faster than ordinary routers. If you experience burning, speed up the feed rate. If the tool sounds like it's bogging down, slow down or take a shallower pass.

These trim routers have one drawback: The edge guide accessories available for them are designed for working on, or very close to, an edge. If you need to make an

Bosch 1608/9



Bit of a hassle. The Bosch trimmer is the only one reviewed without a spindle-locking button.

DeWalt DW 670



Quick-release base. A twist of a lever removes the base, and a spindle-locking button makes bit changing a one-wrench operation.

Porter-Cable 7310

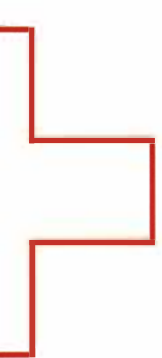


Neatness counts. After removing the base, don't let the locking screw, washer or spring wander into a pile of sawdust.

inset cut, such as a dado, you'll have to cobble up your own fence.

All three tools are good for making small- to medium-sized cuts in a variety of woods. The Porter-Cable felt the most like a typical router. The low height and wider base (3 1/2 in. by 3 3/4 in.) make it the most stable. The DeWalt has the most advanced design; to remove the base, you simply turn a lever. Its shape is very comfortable for one-handed operation. Bosch has the finest depth adjustment and smallest base, which lets you get into some tight spots. □

Sven Hanson works wood in Albuquerque, N.M.



Woodworkers' First Aid

You plan to work safely.
But do you have a plan if something goes wrong?

BY ALAN MARCO, M.D.

Woodworking is inherently dangerous. It says so right in the beginning of this magazine. It's the sort of thing everyone knows. I could begin with the story of John Woodough who loses a finger on a tablesaw, but that won't tell you anything you don't already know. What I want to tell you is what to do in the event of an accident: those cases when you can take care of yourself at home and those times when you need to get to the hospital. Being prepared might save an eye, a finger or a whole lot of blood. And knowing what to do immediately after an accident can help those in the emergency room put you back together.

Minor cuts and abrasions

Cleanliness is a relative term. A clean woodshop is still a veritable petri dish of germs and dirt. Barring a serious laceration or amputation, you have to clean any bleeding injury with soap and water to ward off possible infection. Inspect your wound for foreign bodies. If it didn't grow in you, it's a foreign body: bits of wood, grit, metal. Remove them by flushing with water. For deeply imbedded grit, you may need to grit your teeth and use a scrub brush. Avoid alcohol or peroxide because both may cause more tissue irritation. To kill germs, it's better to use a providone-iodine solution, available under many different brand names, such as Betadine. Soap and water works too. Apply an antibiotic ointment to the wound if desired. If bleeding persists, apply pressure to the affected site with a clean gauze pad. When the bleeding stops, cover the small cut or abrasion with a dry, sterile bandage for two to three days.

Check the wound periodically for renewed bleeding or signs of infection, such as increased pain, swelling or redness. Minor swelling and redness is normal in the first day or two. Also watch for red streaks going up your arm or leg or pus drainage. If these occur, you should have the injury evaluated by your doctor. If you have a serious medical condition such as diabetes, which can interfere with healing, you may want to have the wound checked

by your doctor. Also, if your last tetanus vaccination was more than 10 years ago, get a booster shot at your next checkup.

For serious injuries: Don't panic

Pain is your body's way of telling you something is wrong. And, fortunately, the body's immediate reaction to pain—roughly the amount of time between flipping a light switch and the light going on—is to remove itself from the offending situation.

The majority of woodworking injuries happen to the hands. The natural reaction when you've hurt your hand is to cover it with your other hand, put pressure on the wound and hold both hands to your stomach. But at some point, you have to look at what has happened. Of course it hurts, but jumping up and down, yelling words that used to get your mouth washed out with soap, isn't going to help. Sit down and take a few deep breaths. Sitting down is a good idea for several reasons. It will tend to make you relax, as will the deep breaths, and if looking at the injury is going to cause you to swoon or feel light-headed, you're less likely to fall down from a seated position. Now, take a look at what has happened.

Lacerations—In addition to the general guidelines given above, you should assess whether a laceration needs to be seen by a doctor. If the cut is spurting blood, there is likely to be an injury to an artery, and you should be seen in the emergency room. To control bleeding, apply pressure with a clean gauze pad. Apply an ice pack to reduce bleeding and pain.

If the bleeding is stopped or is minimal, inspect the wound. If the wound edges come together easily, clean the wound, and apply a bandage. If the edges are somewhat separated, try to bring them together with butterfly closures or adhesive strips. If the laceration is gaping and more than ¼ in. deep—the edges do not come together—or if it is on your face, where scarring is less acceptable, you may need stitches. And go to a doctor if you see muscle (it looks

First-aid kit for your shop

Don't take supplies from your first-aid kit for anything other than treating accidents. Someday you might need the adhesive tape and scissors for an emergency only to remember you used them to pack up sawblades to send out for sharpening. If you must use some of the supplies, replace them as soon as possible. Be aware of expiration dates on some first-aid supplies. This wall-mounted metal box is available from Lab Safety Supply (800-356-0783).



Top shelf: An asthma inhaler can counteract allergic reactions to fumes and to exotic-wood dust; sharp scissors for cutting bandages; adhesive tape for bandaging; an elastic bandage for securing dressings.

Middle shelf: Needles for splinter removal are stored in sterile alcohol; splinter tweezers, precise enough to pick up a single hair; 4-in. by 4-in. gauze pads for bandaging; assorted adhesive strips for small boo-boos; clean plastic bag for amputated parts; sterile rolled gauze for bandaging; butterfly bandages for drawing together larger lacerations.

Bottom shelf: Providone-iodine solution for killing germs; eye wash and cup; small mirror for eye inspections; instant ice packs to reduce swelling or for transporting amputated parts to the hospital; latex gloves for eye examinations.

First aid



Abrasions and small cuts: Clean wound with soap and water. Apply antibiotic cream or providone-iodine solution. Bandage and check dressing daily. See your doctor if there are signs of infection: increased redness, pus or red lines running from wound.



Splinters: Remove with sharp, pointed tweezers. (They should be sharp enough to pick up a single hair.) If splinter is completely under the skin, expose splinter end with sewing needle doused in alcohol, and then remove with tweezers.



Lacerations: Clean wound with soap and water. Assess damage: If laceration is gaping or more than $\frac{1}{4}$ in. deep, seek emergency help. Otherwise, apply pressure to stop bleeding. Close wound with butterfly closures or adhesive strips. Check dressing daily.



Fractures: Signs include extreme pain, swelling, bruising and an inability to move an adjacent joint. If you have any of these signs, you should be seen by a doctor to see whether you need an X-ray to evaluate for a fracture.



Amputations: Apply pressure to wounded area with clean bandage. Don't panic. Call for help. Raise wounded area above heart. Wrap amputated appendage in plastic bag. Keep appendage cool, not directly on ice. Sit in a chair near door, and await help.



Eye injuries: Look in mirror to assess eye. If foreign matter is embedded in the eye, go to the emergency room. If foreign matter is on the surface, flush it with water, or use eye wash and cup. For chemical splashes, flush with running water for five to 10 minutes. If it hurts too much to open your eye, go to the emergency room.



Fumes and dust: If you feel dizzy or are having trouble breathing, leave the area, and go to fresh air. If normal breathing doesn't return in 15 minutes, go to the emergency room.

FIRST-AID INFORMATION

Ambulance #

Physician #

Emergency room #

Poison control
center #

Hospital address

In case of
emergency, call

Name:

Number:

Name:

Number:

Last tetanus shot

Date / /

Date / /

Date / /

First-aid kit last
restocked

like steak), fat or tendons in the wound or if there is a flap of flesh.

If the area beyond the laceration is numb, you may have injured a nerve. If you cannot bend the adjacent joints, a tendon may have been injured. If the wound continues to spurt blood or the arm, leg or finger is cold compared to the others, you may have injured the artery feeding that part, and you should go to the emergency room immediately.

Fractures—The most likely fracture (aka, a broken bone) woodworkers experience in the shop is a finger fracture, usually the result of a hammer or a nail gun. Shooting a nail through the bone in your finger is particularly serious because this type of broken bone, called an open fracture, has a high likelihood of infection.

How can you tell when a nail hits bone? Signs include extreme pain, swelling and bruising. Although it may seem strange to list extreme pain, it's not to people who have done this. They have no problem distinguishing between hitting bone and just flesh. If a nail goes through a joint, get evaluated by a doctor. Another sign of a fracture is not being able to move the joint next to the injury because of pain. If you have any of these signs, go to a doctor to see whether you need an X-ray.

If you whack your finger with a hammer, put some ice on it. I stick my finger in a cup of water filled with ice cubes; it's easier than holding an ice pack. Check for the fracture signs given above, and if the finger isn't feeling better, have it checked by a doctor. A common thumb-whacking injury is a bruise under the fingernail; doctors call it a subungual hematoma. Although it looks terrible—and sounds terrible—it only needs draining if it causes such pain that you are unable to go about your business.

Amputations—Let's face it—this is what we fear most. There's a scene in Ken Kesey's *Sometimes a Great Notion* where Hank Stamper pulls off his gloves, and his wife sees that he's cut off one of his fingers during work. Macho Hank just keeps working. She's horrified, and you should be too.

With any complete or partial amputation, the first step is to control bleeding with a pressure dressing. Wrap something clean around the wound, and hold on. Blood loss is a big factor here. An ice pack and elevating the affected site above the level of your heart will also help to control bleeding.

Amputations need professional attention, so proceed directly to the hospital. If you can find the amputated part, wash it off, place it in a plastic bag and put the bag on ice. To avoid frostbite, do not put the part directly on ice. The doctors may not be able to reattach it, but the odds go way up if the amputated part is at the hospital and not in the sawdust bin back at the shop.

If you cut off more than a finger, immediately apply pressure to the stump to control bleeding. Don't panic; keeping cool can save your life. Call for help. If you can, unlock the front door to save time for the paramedics. Sit near the door, or if you feel light-headed, lie on the floor. Don't worry about the cut-off part; the paramedics will find it.

Eye injuries

The most common eye problems in the shop are from foreign bodies and chemicals. If you get something in your eye, don't poke at it with a dirty finger. Closely inspect the eye in a mirror or have someone do it for you. If the material is imbedded in the eye, go to the

hospital. If the material appears to be floating on the surface of the eyeball, the best thing is to flush it out with eye wash or plain tap water. Hold your eye open so that the water can actually wash out the material. The eye may not feel completely better because it may have been scratched, but if it is feeling better during the day, it should be fine. If the material is still in there, you should have a doctor examine the eye. Also, removing bits of metal should be left to a professional.

Chemical splashes from finishes or strippers can be very damaging to the eye. If a splash occurs, immediately flush the eye under running water for five to 10 minutes. If the eye is still painful or if an alkaline substance like lye, caustic strippers or cement was splashed in the eye, you must be evaluated by a physician. As a general rule, if the eye hurts so much that you can't open it, go to a doctor at once.

Fumes and dust

Breathing various fumes or dusts can cause illness. Some vapors from finishing products are heavier than air and will collect in our basement workshops unless vigorous efforts, such as exhaust fans and open windows, provide adequate ventilation. If you are working with a finish or solvent and feel dizzy or sleepy, you may be intoxicated by the vapors. Leave the area at once, opening a window or door to the outside as you go.

With the growing popularity and availability of exotic woods comes an increasing incidence of allergic reactions. Repeated exposure to the oils in these woods can cause rashes, but it is possible for the allergy to first manifest itself by breathing problems such as acute asthma or wheezing. The fine dust or the smoke from machining these woods can trigger an attack. If you find that you are having trouble breathing while working with these woods, stop what you are doing, and leave the area. If you don't improve or you are struggling to breathe—you can't get out more than a few words—you should seek medical attention. Over-the-counter asthma inhalers can be tried, but these may not be appropriate if you have high blood pressure or heart disease.

Also, woodworkers are at risk for chemical burns from some strippers that may contain lye or bleaching agents such as oxalic acid. If you come into contact with these materials, immediately flush the affected part with water for at least five minutes. If the area blisters, especially if it involves the face or hands, see a doctor.

What to expect in the emergency room

Forget the television shows where the emergency room doctors and nurses are waiting to solve the day's problems in less than 50 minutes. Typically, you will be seen by the triage nurse who will determine the priority of your condition. Although a bad cut needing stitches is a big deal to you, it can wait while the patient having a heart attack is seen. Eventually, you will be seen by a doctor who will determine the extent of the injury and whether tests are needed, such as X-rays. If the injury is complex, such as full or partial amputation or severe eye injury, the emergency physician will arrange for consultation with the specialist on call, such as a hand surgeon, plastic surgeon, orthopedic surgeon or ophthalmologist. □

Alan Marco, M.D., is an anesthesiologist and a woodworker. His wife, Catherine Marco, M.D., an assistant professor of emergency medicine, assisted in writing this article.

PERSONALIZE YOUR HOUSE

A Mantel with a Mission



Arts-and-Crafts overmantel
beautifies a tract-house fireplace

BY MARIO RODRIGUEZ

Some friends of mine live in an attractive but indistinguishable Ranch-style house. Built in the 1970s, it's a typical tract house, produced cookie-cutter style to fit a tight budget and a streamlined modern lifestyle. They loved the house when they bought it, but they always knew there were a few things they would want to improve. First on their list was to do something with the plain brick fireplace and raised hearth in the living room.

When they came to me looking for a nice wooden mantel, it took some time to find a design that matched the house, the furnishings and the owners' tastes all at the same time. The raised hearth was originally intended to make a cozy fireplace perch. A nice idea, but it brought up a design problem I've never had to deal with before: Exactly what kind of mantel do you install on a raised hearth fireplace?

After looking through a number of books and a lot of experimenting at the sketch board, I decided a simple wrap-around mantel in an Arts-and-Crafts style would work nicely. A wrap-around mantel would enhance the horizontal sweep of masonry, not fight with it. I also considered ease of construction and time and materials. With a little planning, I'd be able to construct the majority of the mantel in my own shop and install the whole job with only a day's work in my friends' living room.

The design I settled on calls for a simple four-panel overmantel and a 2¼-in.-thick mantel shelf. I wanted the mantel to appear well-balanced and symmetrical, so I designed the shelf to rest on five brackets that are all directly in line with the stiles on the overmantel.

A bluestone slab on top of the hearth would be an attractive way to cover the brick, and a wooden skirt around the raised hearth would hide the masonry, tying the hearth and mantel together visually. I didn't want anything to detract from the design or distract the viewer, so I chose rift-cut red oak, both solid and plywood. This combined the rich, rough surface of oak with an inconspicuous dead-straight grain.

I was able to speed the construction process by doing most of the work in my own shop and reducing the number of cuts I had to make for the joinery (see the photos above). I used plywood with a solid frame to make up the four-panel overmantel. For the rails and stiles, I used ¾-in.-thick red oak, milled with a ¼-in. plow, ¾ in. deep and centered on the inside edges of the frame. This one groove acted as both a mortise for the stub tenons and as the groove to hold the panels.

For the ¾-in. stub tenons on the ends of the rails and short stiles, I used a tablesaw to cut the shoulders and a bandsaw to cut the cheeks. Then I installed a dado blade on the tablesaw to cut rabbets into the ½-in.-thick plywood panels. All the joinery was cut with only a few machine setups. The frame-and-panel overmantel slipped easily together for glue-up in the shop. The plywood re-

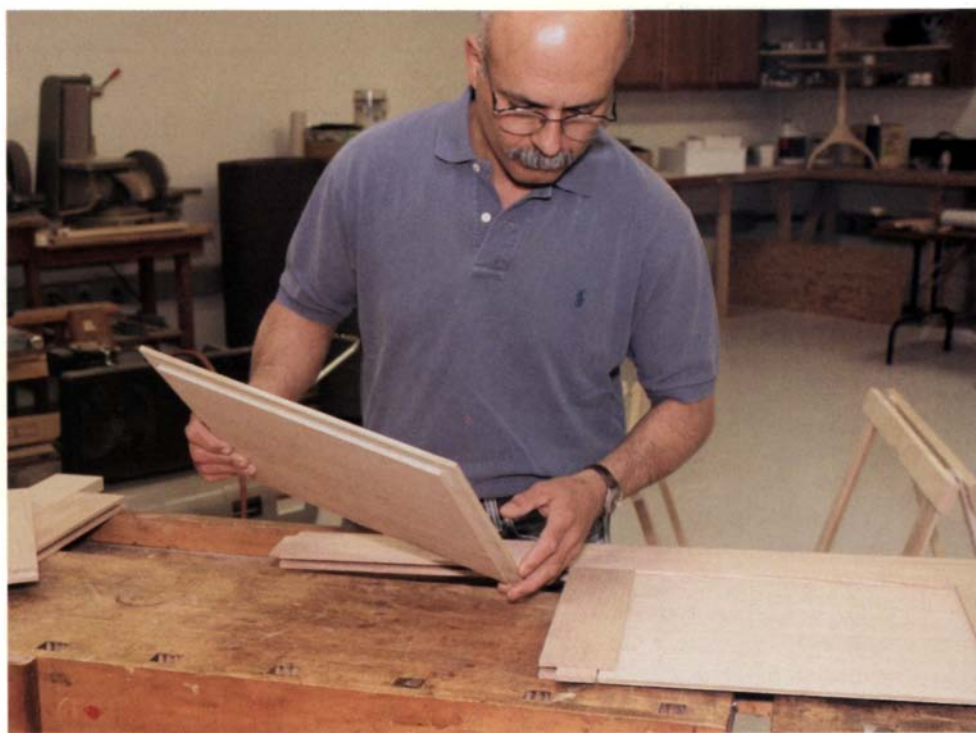
QUICK FRAME-AND-PANEL JOINERY



Single groove does double duty. A groove plowed with a dado blade serves as both the mortise for the tenons and the groove to hold the panel.



Stub tenons make it plenty strong. With the shoulders cut on a tablesaw, a bandsaw completes the stub tenons on the ends of the rails and short stiles.



Fast rabbets with a dado blade. The panels are rabbeted with a dado blade. The frame-and-panel overmantel is glued up before it leaves the shop.

turns were mitered to the end stiles for a cleaner, more seamless look. I used biscuits to align and secure them in place.

A plywood mantel shelf is lightweight

If I had used a 2¼-in. slab of solid red oak for the shelf, it would have added considerable weight. Instead, I used two layers of ¾-in. red-oak plywood with ¾-in. plywood strips as spacers. The use of plywood also eliminated cross-grain movement or shrinkage, which could be considerable so near a source of heat.

I cut two identical pieces to make up the top and bottom of the shelf. One of the spacers is placed flush with the front of the shelf; the other is inset ½ in. from the back. Leaving this room on the back edge reduced the amount of material I'd have to trim to get a snug

fit when the shelf was installed.

With the shelf built up to a thickness of 2¼ in., I glued plywood spacers on each of the returns that extend back to the wall. When the shelf was dry, I edged the entire lamination with red oak cut to a light ⅛ in. thick on the tablesaw. When the glue had dried, the overhang was carefully trimmed flush to the plywood with a block plane, then scraped and sanded.

Cut everything ahead of time

The mantel skirt is made of ¾-in. red-oak plywood, mitered at the outside corners and later nailed into place. I prepared the wood for the mantel skirt, but I did not assemble it in the shop. By leaving the skirt in parts, I could easily scribe the returns to the wall before they were attached.

I knew that there would probably be a conspicuous gap between the masonry and the skirt's bottom edge. I also knew that the exposed plywood edge of the skirt would have to be covered. A simple and attractive way to deal with both problems was to attach a quirk-and-bead molding along the bottom edge of the mantel skirt. I used a ¾-in. beading bit to run off two 8-ft. pieces from clean, straight-grained oak. This allowed me a little more than I'd need.

For the cornice molding, I used a simple 1⅝-in. cove molding from a local lumberyard. This type of molding is usually a stock profile and shouldn't be difficult to find.

Because of their prominent position, the brackets on this mantel must be well executed: clean square edges and smooth flowing curves. Aside from the installation, they're probably the most demanding part of this job. The method I use ensures crisp edges and reliable curves (see the photos on p. 74).

The skirt around the hearth does more than just cover the bricks: It's the key to connecting the hearth and mantel visually. The hearth skirt is also made of ¾-in.-thick red-oak plywood mitered at the corners and tacked over cleats that are screwed to the brick. With the plywood for the hearth skirt cut to size, my work in the shop was almost done.

Finish before mantel is attached to the wall

Finishing can be a slow and tedious process if you wait until the whole piece is assembled and installed. The process goes much

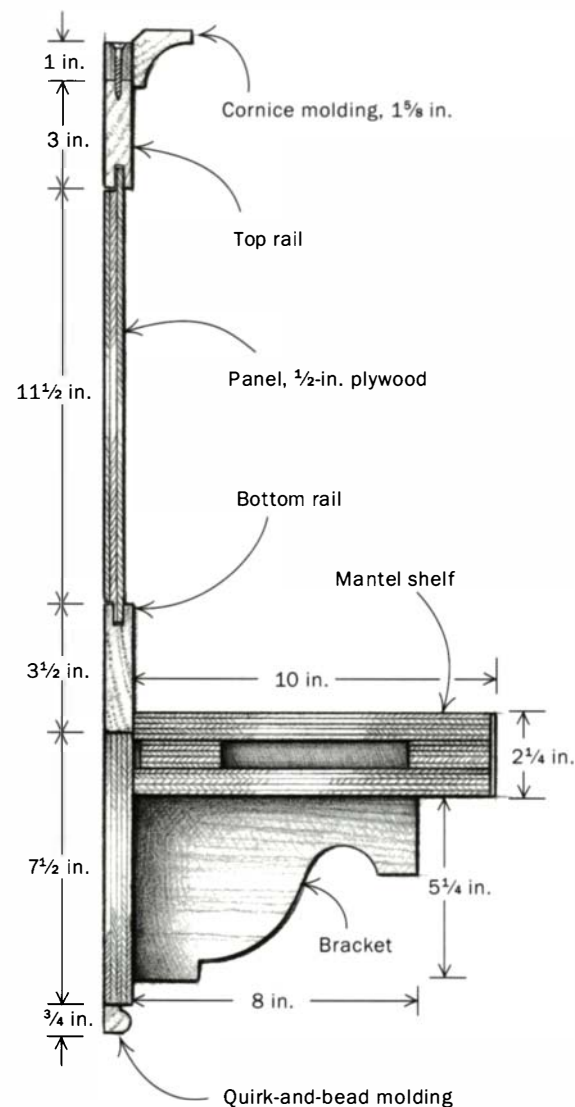
PREPARATION IS KEY TO SUCCESS



Starting from scratch. To make this design work, the area above the fireplace was built out flush with the brick. A 2x4 frame was attached above the fireplace; drywall and mud made it a workable wall. All the stud positions were marked, and measurements were taken to make sure the mantel went up without a hitch.

ARTS-AND-CRAFTS STYLE OAK MANTEL

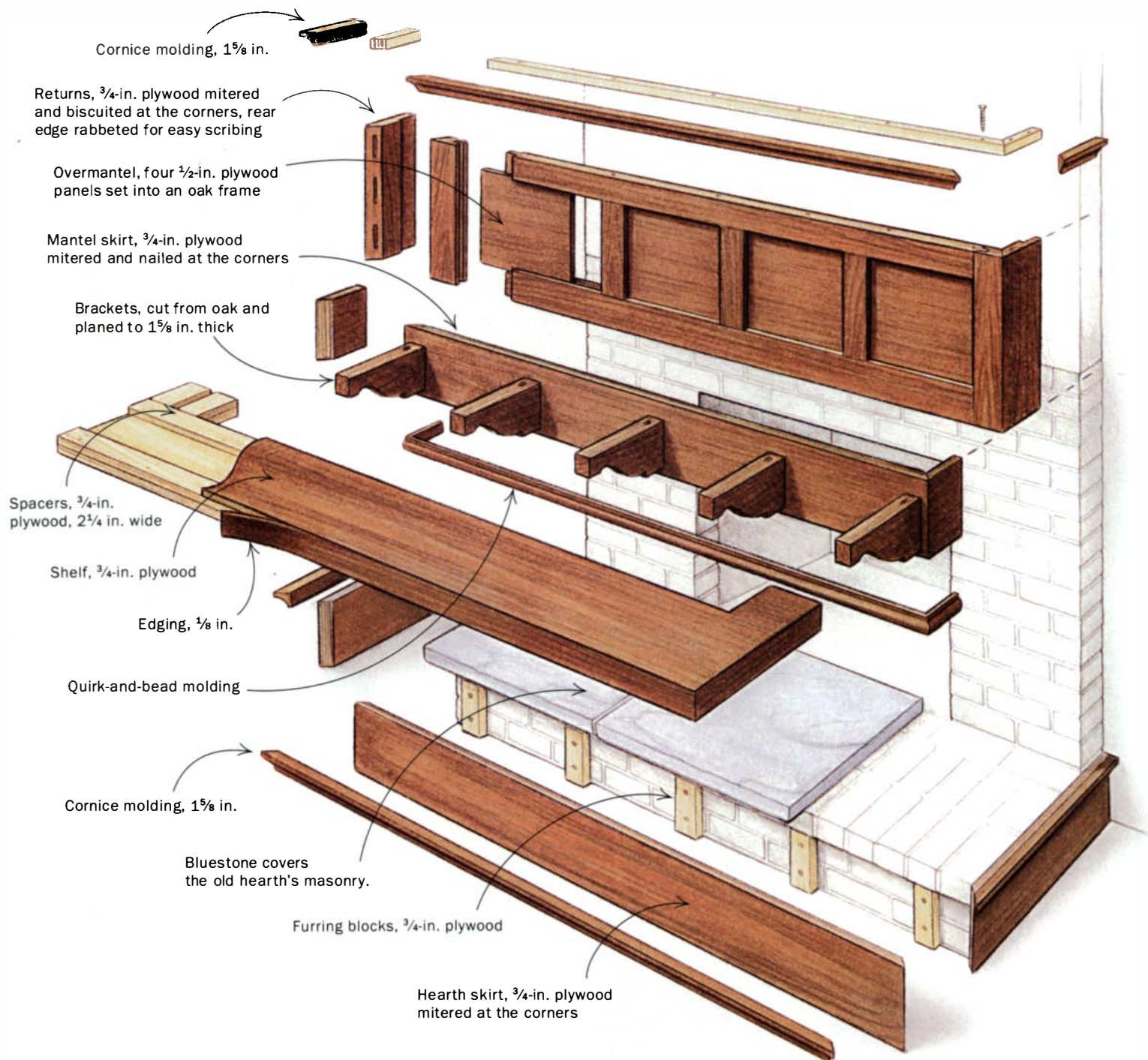
This mantel was designed to revive an old fireplace with a raised hearth. The use of a straight-grained wood draws attention to the design. Small details like a repeated cornice molding tie the hearth and overmantel together visually.



faster when things can be laid out flat in your own shop before you have to be careful with someone else's walls.

After all the parts were sanded with 220-grit paper, I applied a light honey-colored oil-based stain by Minwax (Ipswich pine) with a 2-in. brush and wiped up drips with a rag. When the stain was dry, I coated all the parts with two light coats of orange shellac. This gives the oak a very rich color with a slight orange cast. If your taste runs to a cooler shade of oak, you can use blond shellac instead of orange. To get a satin finish, I gently rubbed out the shellac with steel wool between coats.

Rubbing out woodwork usually results in cut-throughs—spots on the sharp outside corners where the color and finish have been rubbed through by the steel wool. To repair these spots, I ran a medium-brown furniture marker along the exposed edges,



THREE STEPS TO PLACE A MANTEL



Overmantel slides onto the wall. With the overmantel shimmed level, driving a few screws ties it to the wall.



Skirt abuts the overmantel. Shims guarantee that the overmantel and skirt meet flush.



Shelf fits easily onto the brackets. Using reliable measurements in the planning stage ensures the shelf seats itself perfectly level.



BRACKETS WITH PERFECT CURVES

The eye notices when a curve is not exactly circular. Using a Forstner bit gives the author a true and reliable curve.



A tablesaw keeps the edges square. A tablesaw and a crosscut box are used for an exact cut on the bracket's square ends.



A fresh blade and a steady hand. The rest of the outline is finished on a bandsaw fitted with a fresh $\frac{1}{4}$ -in. 6-tpi blade. After completing the outline of the brackets, a series of rasps, files, scrapers and sandpaper produces a smooth surface free of any machine marks.



INSTALLING THE BRACKETS



A single lag bolt secures a bracket in place. With the bracket clamped at a perfect right angle to the skirt, the author has two free hands to secure a lag bolt from behind.

quickly blending them in. The mantel could be installed and this finish left alone, but by applying a glaze after installation, you see a real transformation in the room (see the box on the facing page).

Tap-Con screws make installation easy

With most of my work already done, the mantel went into place quicker than I thought it would. Figuring that the top surface of the mantel shelf should be about 53 in. from the floor, I marked the wall to help me place the overmantel's bottom edge. Along the top edge of the overmantel, I screwed a strip of $\frac{3}{4}$ -in. plywood. The strip allows me to use a narrower top rail and limits cross-grain movement at the joint. The plywood strip will also flex, so there is no strain or pressure on the solid top rail when the overmantel goes onto the wall.

Next I centered the brackets under the overmantel stiles and attached each with a single countersunk lag bolt from behind (see the top right photo above). A single bolt will secure the brackets to the mantel skirt but will still allow them to be pivoted slightly.

Hanging the mantel skirt is a critical step in the installation. If the skirt doesn't go up perfectly plumb and level, the shelf will have either a forward or backward pitch. I inserted shims behind the skirt and directly underneath each bracket to ensure that the placement was just right. With the brackets pivoted out of the way, a few Tap-Con screws tied the whole unit into the wall.

Those Tap-Con masonry screws were key to a simple installation. I've used the bright blue screws before on another mantel installation and was surprised at the simple two-step procedure. Instead of using lead or plastic anchors, Tap-Con screws only require one simple pre-drilled hole before driving the screws home. Once home, they hold tight, and nothing short of a pry bar will loosen them. But they can be easily withdrawn with a screw gun if





The brackets twist away. When the skirt slides over the brick, the lag bolts allow the author to twist the brackets for easy access to a hidden spot to sink a screw.



A screw locks the bracket. After the skirt is tied to the wall, a screw is driven at 45° to hold the bracket permanently in place.



Shelf is attached from underneath. The shelf goes onto the brackets, and an inconspicuously placed screw keeps it there.

something has to be repositioned or removed.

I snugged the tip of the 3/4-in. plywood skirt to the bottom edge of the overmantel and secured it with four Tap-Con screws. These screws are hidden when the mantel shelf is in place. I made sure the brackets were all level and ran a screw diagonally from the top of the brackets into the mantel skirt to give them extra strength.

The shelf was designed to extend 5 in. beyond the corner of the overmantel and 10 in. from the overmantel face. It should fit without much trouble around the overmantel and onto the shelf brackets. I used a plane and a 2-in. chisel to trim the inside of the shelf for a snug fit against a wall that wasn't completely square. A few 1 1/2-in. #8 screws driven through the bottom side of the bracket were used to hold the shelf tight.

I attached a few furring blocks to the hearth's masonry with Tap-Con screws so that I'd be able to nail the skirt in place. The 3/4-in. plywood skirt had already been mitered and cut to the right width in the shop, so I only had to make sure everything fit. I trimmed the ends of the returns with a jigsaw to get a tight fit against the

molding on the wall. Glue and a pneumatic nail gun with 1 1/4-in. finish nails secured everything.

Applying the molding made the whole thing come together. I used the same molding at the top of the overmantel as I did at the top of the hearth skirt, so everything looked natural and seemed to belong. I cut miters for all the molding on a power miter box at the site, and then I nailed it into place with my pneumatic gun. Later, the nail holes were filled with a dark wax. I also ran a bead of caulk between the masonry and the mantel skirt to make sure no stray sparks could get trapped.

With all the parts pre-finished, I applied a quick glazing to knock off the high shine and give the mantel a subtle, mature look (see the box below). When the stone was placed on the skirt as a final touch, the mantel seemed to have been ripped out of a Frank Lloyd Wright home and installed in my friend's living room. The only thing left to do was build a fire. □

Mario Rodriguez is a contributing editor to Fine Woodworking magazine.

An aged look that doesn't take 50 years

With a glazing gel, I can make the mantel look either slightly old or very old. I start with McCloskey's glaze and stir in a raw umber Japan color until I get an almost chocolate color with a yogurt consistency.

I paint a thick coat in the spots that I want darkest: the recesses and the areas where stray smoke would have inevitably darkened the wood over time. But I barely touch the parts I want to stay light.

I let that dry a few minutes, apply another coat if necessary and start pulling off the glaze with a piece of cheesecloth or

an old T-shirt. If a spot looks too dark, a little paint thinner on a rag will pull it up. I leave it dark in the crannies where furniture polish, oils and dust would have accumulated with age.

When I'm happy with the shading on the mantel, I wipe it quickly one last time, using a rag and a tiny bit of thinner.

After a few days of drying, a light coat of shellac or wax will tie down the glaze. This painless process subdues the mantel and conjures an aged, smoky appearance that seems natural in the room. —M.R.



Drilling and Driving

With new combination tools, it's no longer a full-day job

BY DAVID ASHINGHURST



Six or seven years ago, it took four different drills to drive the screws for an armoire I was building. I had three drills chucked and ready—one with a pilot bit, another with a brad point for the counterbores and a third, a drywall screw gun, loaded to drive the screws home. And lost somewhere on the workbench was a cordless drill fitted with a countersink. In all the mess, my feet became ensnared in a tangle of extension cords, and I fell to the cement floor.

Since then, several systems have hit the market, and driving screws is no longer a wrist-wrenching, cord-consuming chore. The tools are designed to drill a pilot hole and countersink or counterbore in one stroke. The drill is then removed or swapped to reveal the driver bit. I have tried three of the more readily available systems that combine the drill and driver into one handy package.

The first one on the market was the Chuck-Mate, and its newfound convenience made it a tremendous success. Later, the Insty-Bit Quick Change system was introduced, and a similar QuickClick line from Snappy soon entered the fray. Now the snap-lock systems have taken driving screws to a new level of ease. The snap-lock setup I evaluated was Makita's Quad-Driver. Similar ones are available from Craftsman, Dewalt and others.

The Chuck-Mate and Insty-Bit systems require removing the drill and counterbore bit and setting it aside to use the driver. The snap-locks contain both the drill and driver in one manageable unit that is flipped end for end to change tools. I preferred the snap-locks because there are no parts to be set aside and possibly lost.

Although the Chuck-Mate is easy to use and drills the best counterbores, its tendency to wobble and vibrate has relegated it to my used drill bit drawer. If you're looking for versatility, Insty-Bit edges out the competition, provided you're willing to lay out a considerable sum for all hex-drive bits. It uses a Quick-Change chuck that, once fitted, allows you to change from one bit to another, chuck-free, in seconds. The snap-lock drivers are relatively inexpensive and easy to use. The simple fact that you don't have to use a different tool for drilling and driving has kept it locked in my cordless drill, easily the most used tool in my shop.

All the tools leave a bit of tearout at the counterbore. For furniture-grade work, where the counterbore will be plugged and visible under the finish, I still reach for a brad-point counterbore bit chucked in a drill. These tools haven't changed that. But for general construction or paint-grade work, any of these tools works well and saves time. And so far, I haven't wound up on the floor. □

David Ashinghurst works wood in East Lyme, Conn.



Chuck-Mate

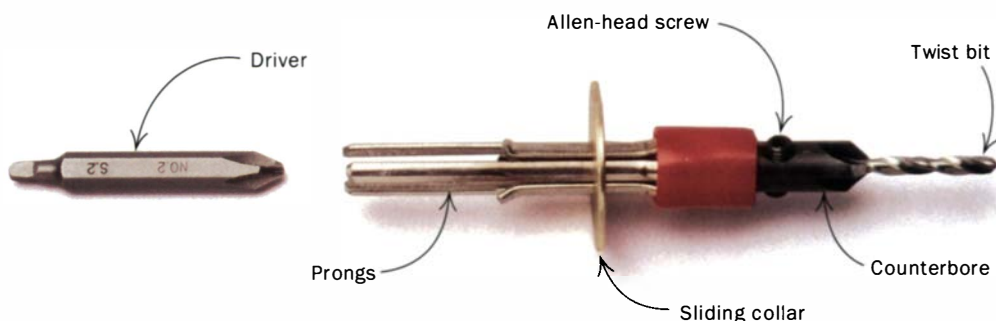


PRICE: \$12.95

OPERATION: Friction fit

COUNTERBORE SIZES:

3/8 in., 1/2 in.



The prongs slide over the driver, which is chucked in the drill.



A disc is pulled down to hold the counterbore tightly in place.



The pilot hole and counterbore are made in one easy motion.



The sleeve is then removed and set aside to reveal the driver.

PROS: The Chuck-Mate is easy to use, and its counterbore cut the fastest and cleanest holes of the group. Although it comes in a wide assortment of drill bits for screws ranging from #3 through #12, I've used a #6 bit almost exclusively for years.

CONS: The friction fit that holds the bit to the driver has a tendency to vibrate loose when the bit is pulled from the work. The Chuck-Mate's drill bit is shortened to fit the tool, and any replacement may have to be modified. Another unnerving characteristic is its wobble. Although the wobble doesn't affect the quality of the hole, the action often made my drill vibrate like a palm sander. Also, an Allen wrench is not included.

Insty-Bit

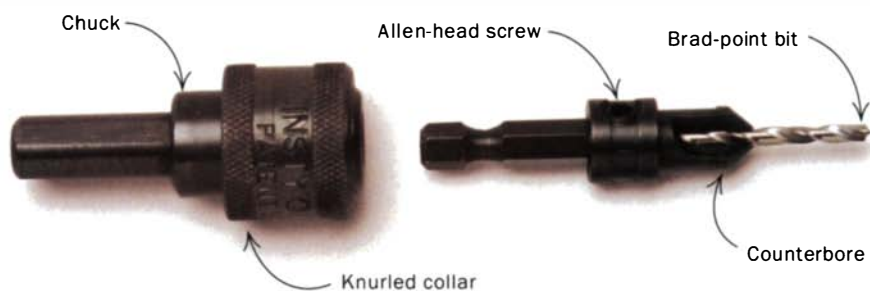


PRICE: \$10.95 for chuck
\$22.95 for set of five bits

OPERATION: Drill
swapped for driver

COUNTERBORE SIZES:

3/8 in., 1/2 in.



Bit locks into place with a detent on its shank.



Pilot hole and counterbore are both drilled in one stroke.



Bit is easily removed and replaced with a driver.



With the driver in place, the drill is readied for driving screws.



Insty-Bit offers a variety of tools that can be chucked in the 1/4-in. adapter. Among them is an extension sleeve (third from right) that enables you to use the pilot and counter-bore bit without removing the driver.



PROS: Of all the tools tested, the Insty-Bit ran the smoothest and offered the widest variety of options. Its 1/4-in. chuck fits all 1/4-in. tools with a detent on the end of their shafts. There was little or no runout, and the positive-locking chuck worked well and consistently. It is also the only one to offer a brad-point bit for drilling the pilot hole. To minimize chuck operations, Insty-Bit has developed an extension sleeve that fits over its hex drills.

CONS: Insty-Bit is advertised as a one-handed tool, but I never mastered the art without dropping the bit. The chuck required two hands to operate—one to hold the chuck ring in position, the other to swap bits. (The company was working on a locking-sleeve prototype as this article was being written.) Also, the counterbore has only two cutters. The deep gullets reduced clogging, but the edge of the counterbored hole required sanding to remove the inevitable burrs. The extension sleeve is a good idea, but in action, it is heavy, long and it wobbles excessively.

Snap-lock

PRICE: \$25 to \$40, depending on brand and options

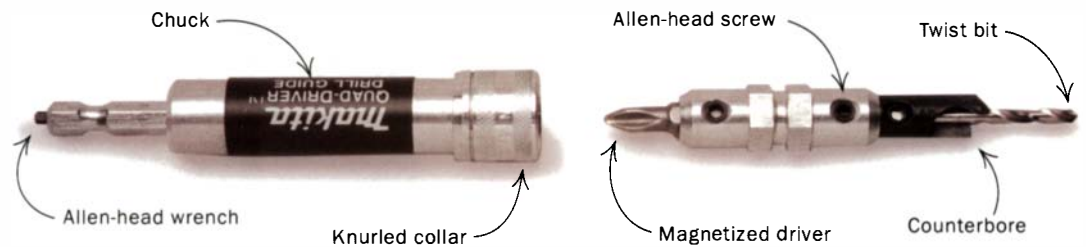
OPERATION: Tool flipped for either drill or driver

COUNTER BORE SIZES:

9/32 in., 11/32 in., 3/8 in., 7/16 in.



Various tool companies offer these new snap-lock tools, including Makita and Dewalt.



One unit combines the pilot bit, counterbore and driver.



The bit unit is flipped to expose a driver on the other end.

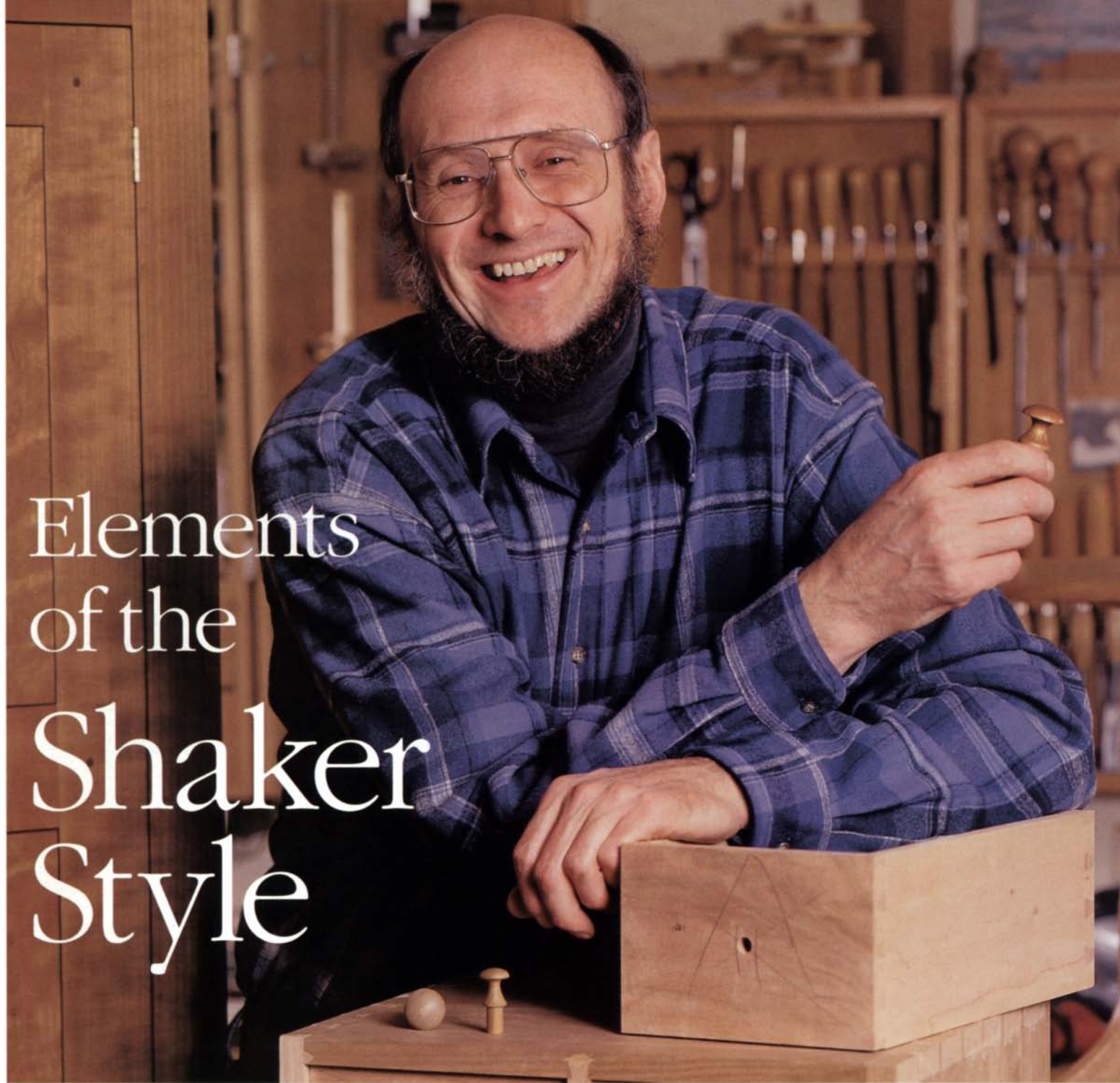


A magnetized driver holds the screw and sinks it home.

PROS: Unlike the other systems that relied on a loose wrench, the snap-locks have a built-in Allen wrench on the end of the tool. Having the proper tool in a permanent and accessible location is handy. It has a positive locking chuck and produced minimal runout. A magnetized driver eased the chore of driving screws.

CONS: The counterbores come in odd diameters, running from 9/32 in. to 7/16 in., with only one being 3/8 in. dia. With only one small cutter on the counterbore, these bits clogged the most, and often. They had to be cleaned following every hole drilled.





Elements of the Shaker Style

Chris Becksvoort
reveals authentic details
that will help you stay
true to the form

Woodworking masters Jere Osgood, Sam Maloof and George Nakashima each evolved a style and explored it to its ultimate conclusion, and to hell with what was in vogue. The Shakers did the same thing, continually refining their idiom until they approached perfection, without regard to the latest trend. They developed a style of furniture that blends well and fits comfortably in any type of house. The Shakers went out of their way to eschew fashion: The result is timelessness.

I grew up in a house full of Danish modern furniture, which was, it turns out, heavily influenced by Shaker designs. Like the Danish furniture makers, I fell under the sway of Shaker furniture the moment I discovered it—in my case, during a slide lecture in an architecture appreciation course I took in college. The simplicity and utility of the furniture I saw in the slides stunned me. In the late 1970s, I began restoring Shaker furniture, and much of my own work has been in the Shaker

“We want a good plain substantial Shaker article, yea, one that bears credit to our profession & tells who and what we are, true and honest before the world, without hypocrisy or any false covering.”

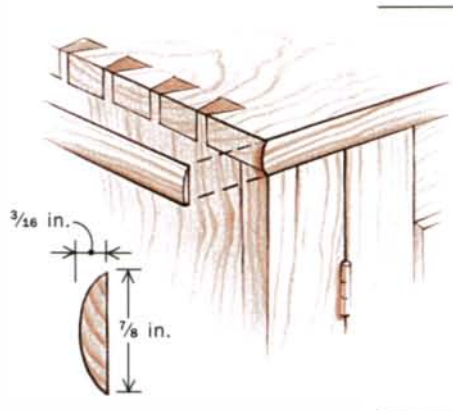
—Orren Haskins, Shaker craftsman

vein ever since. I very seldom reproduce slavishly, but you can look at my work and without batting an eye see its derivation is Shaker.

To make a Shaker-looking piece, adopt a Shaker attitude: Keep it simple in design and materials, make it functional and incorporate authentic details. The details shown on these pages were commonly used by the Shakers until about 1860, after which their furniture began to show the worldly influence of the Victorian style.

The Shakers believed “that which has in itself the highest use possesses the greatest beauty.” It took the rest of the world nearly a century to come to the same conclusion, when, in the early 20th century, Louis Sullivan declared “form follows function.” But these dictums alone do not lead inevitably to a particular style, much less to a specific set of elements and

CROWN MOLDINGS

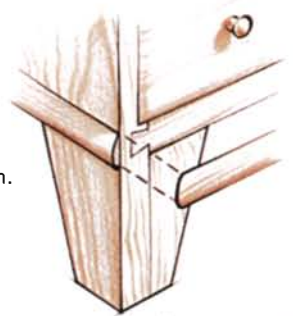
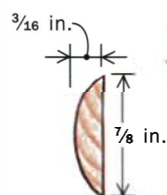


Moldings along the tops of Shaker case pieces are hard to justify as anything but decorative. Most styles of furniture (and architecture) incorporate moldings or some type of overhang at the top. To the eye, a crown molding or overhang denotes an ending; it is much like a period at the end of a sentence. The Shakers, presumably, were not immune to this near-universal need for closure.



BASE MOLDINGS

Shaker craftsmen used base moldings and profiled bracket bases for protection, not decoration. A rounded or shaped edge is far less prone to splintering or chipping than is a sharp, square corner. This is especially true near the floor, where base molds and brackets are likely to encounter brooms and mops or shoes and boots.

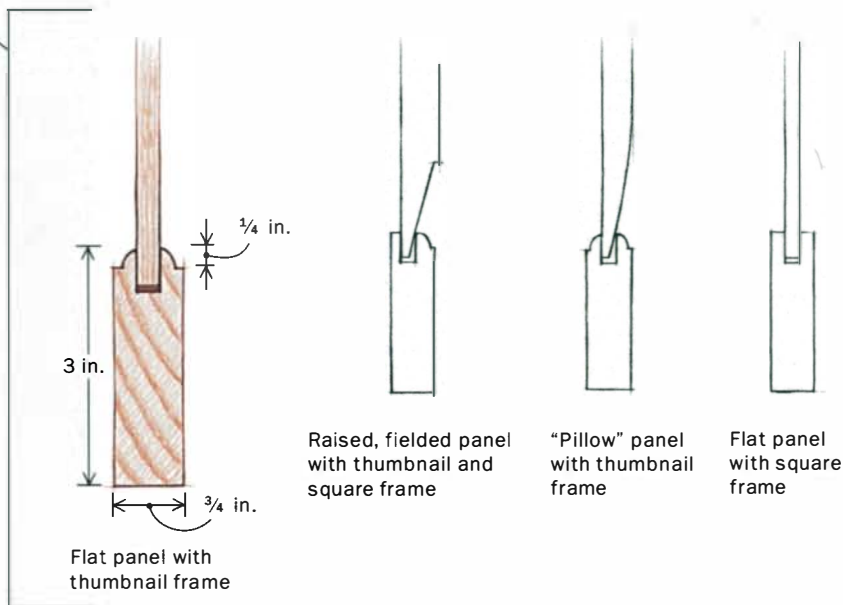




DOOR FRAMES AND PANELS

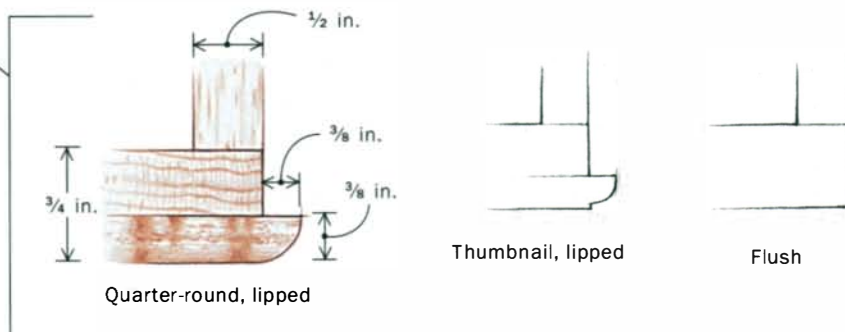
The doors on early Shaker pieces usually had raised, fielded panels. Over time, however, the raised panel fell out of favor, perhaps because it appeared too decorative or possibly because the shoulder was seen as just another dust collector. In any event, the flat panel ultimately replaced the more traditional raised panel as the first choice of Shaker cabinetmakers. In the transition, the pillow panel, as I call it, was sometimes used. Instead of having a well-defined, shouldered field, the panel was planed on all four edges to fit the groove in the frame. The result was a field that was barely noticeable.

Although square-shouldered door frames were used on occasion, more often than not, the frames featured a quarter-round thumbnail profile along their inside edges. To me, this represents a perfect example of a utilitarian, as opposed to a strictly decorative, molding. Rounded edges along the inside of the door frame are much easier to keep clean than straight, square shoulders.



DRAWERS

Shaker craftsmen built both flush and lipped drawers. Flush drawers had square edges and fit fully into their openings. Lipped drawers, although more difficult to make, covered the gap around the drawer front to keep out dust. The lips, however, were usually on the top and two sides only. A lip on the bottom was considered too fragile, should the drawer have to be set on the ground. The quarter-round and thumbnail profiles were commonly used on all four edges of lipped drawers. Neither the Shakers nor their worldly contemporaries used the bevel-edged, raised door panel as a drawer front. That design fiasco was perpetrated on consumers by the kitchen-cabinet industry.



Cherry cupboard
80 in. by 44 in. by 19 in.
Canterbury, New Hampshire
Circa 1850-1900

details. In addition to being inspired by their beliefs, the Shakers and the furniture they made were influenced by their historical context.

In short, the Shakers took the furniture they were familiar with, the local styles from New England to Kentucky, and stripped it of superfluous ornamentation. The Shaker craftsman Orren Haskins (1815-1892) perhaps said it best:

"Why patronize the outside world? ... We want a good plain substantial Shaker article, yea, one that bears credit to our profession & tells who and what we are, true and honest before the world, without hypocrisy or any false covering. The world at large can scarcely keep pace with it self in its stiles and fassions which last but a short time, when something still more worthless or absurd takes its place. Let good enough alone, and take good common sense for our guide in all our pursuits, and we are safe within and without."

Shaker furniture, especially from the classic period of 1820 to 1850, contains little in the way of excessive moldings and virtually no carving or veneer. The Shakers favored native materials and were dead set against materials they felt were decadent, such as brass. The Western communities tended to follow the local vernacular style to a much greater degree than their Eastern counterparts. So the Shaker furniture from Ohio and Kentucky appears more ornate.

Some forms of furniture were never built by the Shakers. You will never see Shaker coffee tables, for example, nor tea tables, highboys, pencil-post beds or upholstered pieces. Some furniture companies market these items "in the Shaker style," including improbable pieces such as entertainment centers.

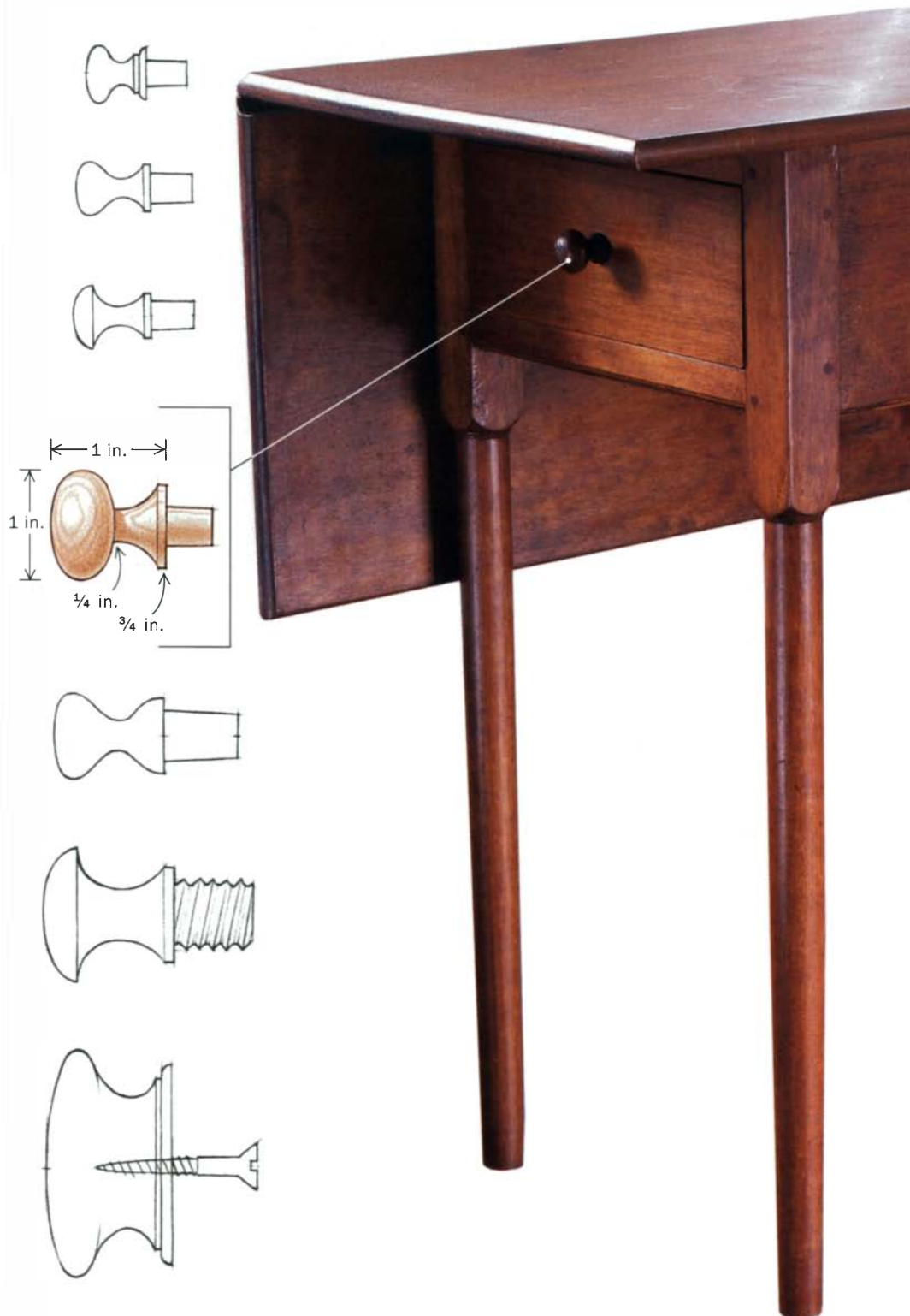
Certain elements appear over and over in Shaker furniture and make sense within the idiom. In striving for a design that remains faithful to the Shaker style, be mindful of their approach—just as you wouldn't build Queen Anne out of poplar, you wouldn't build Shaker out of rosewood. And pay close attention to the details. □

Chris Becksvoort is the author of The Shaker Legacy, available this fall from Taunton Press.

KNOBS

Shaker craftsmen continued the theme of simplicity right down to the knobs. Prior to the 1850s, most Shaker knobs were shopmade, although some early pieces had commercially manufactured porcelain knobs in either white or agate, a marbled brown color. After 1860, manufactured knobs became more and more common.

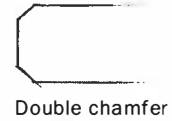
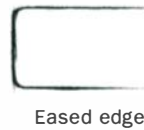
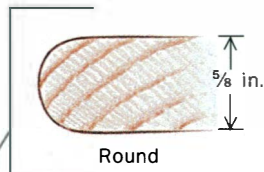
The typical Shaker knob was a variation of the mushroom form. Sizes ranged from $\frac{3}{8}$ in. dia. on tiny desk drawers to $2\frac{1}{4}$ in. dia. on large built-ins. Knobs up to $1\frac{1}{2}$ in. dia. were typically spindle turned, with either a plain tenon (glued and wedged through the door or drawer front) or a threaded tenon. Larger knobs were usually face turned and attached with steel screws from the inside. Shop-built Shaker knobs were always made of hardwoods, often of a contrasting species to the rest of the piece.



TABLETOP EDGES

A fair number of Shaker tabletop edges were square or only slightly eased. A square edge, however, was by no means the only profile used. Shaker craftsmen realized that a simple, shaped profile was not only less prone to damage than a square edge but also less painful when bumped.

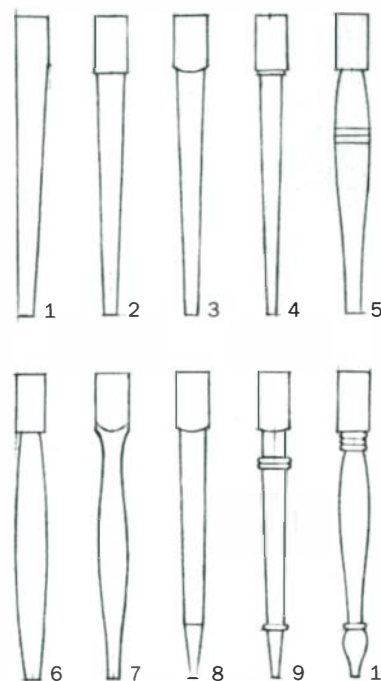
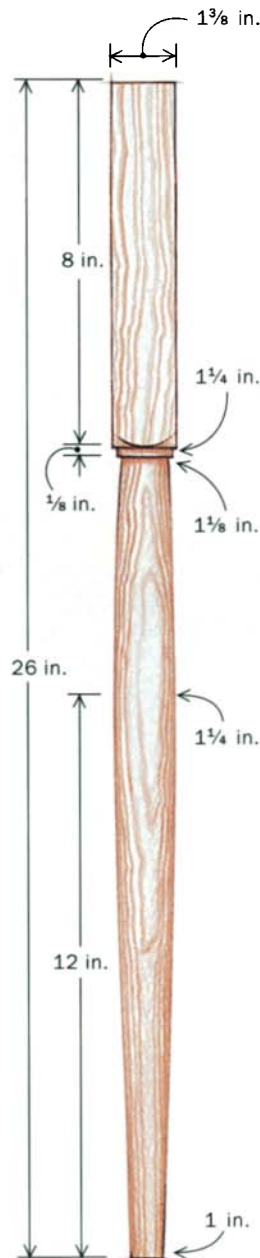
Rule joints were used on drop-leaf tables. The joint looked crisp and was less likely to lodge crumbs or pinch items hanging over the edges.



LEGS AND TURNINGS

Shaker table legs were, for the most part, quite simple. The double-tapered square leg was by far the most common form. The tapers were cut only on the two inside faces to give the leg a wider, sturdier stance and appearance. Another favorite leg was the straight-turned taper, most often seen on drop-leaf tables. These legs are often splayed a few degrees, because turned tapered legs attached at 90° to the top appear pigeon-toed. Swell tapers were also popular. This form started a bit narrow under the shoulder, then swelled to a maximum diameter at one-quarter to one-half of the way down.

Shaker craftsmen handled the transition from the square area at the top of the leg to the turned portion in several ways. Frequently, they cut the shoulder perfectly square, a 90° cut with a parting tool. An easier, more common transition was the 45° cut, resulting in a rounded shoulder.



1. Double-tapered square
2. Straight-turned taper with straight shoulder
3. Straight-turned taper with round shoulder
4. Taper with small, flattened ring below square shoulder
5. Swell taper with three scribes
6. Swell taper
7. Swell taper with long, round shoulder
8. Telescope or double taper
9. Straight taper with rings
10. Swell taper with rings and pear foot

Cherry single drop-leaf desk
Top: 14 1/2 in. by 30 in.; leaf: 12 in.
Carcass: 12 3/4 in. by 20 1/2 in.
Canterbury, New Hampshire
Circa 1850-1900



Large-Case Construction

Strategies

Simplified joinery and a solid plan
keep big jobs under control

BY BRUCE COHEN

I use quick but accurate drawings and cut lists to make sure that my projects are well organized even before I mill the first board. I dimension all the parts at once and cut my simplified joinery with only a few machine setups. Parts are always neatly stacked, clearly marked and easily found. I first build small sections that are easy to handle and then bring them together in a final sturdy case. Assembly and glue-up becomes a rewarding and almost leisurely task.

Shop drawings are the only way I know to keep the details of a large case under control (see the inset photo on the facing page). I first use the drawings to figure out the dimensions of each part, and then a final drawing helps me compile cut lists (see the photo at right). During milling and construction, I refer to the drawings and the cut lists constantly. To do otherwise with so many parts to keep track of would introduce errors and would risk endless confusion.

I always draw an isometric view of the front and one side, an elevation of the back, and a top view. Often I'll add views of selected internal frames, just to make sure I keep them straight. I like to keep all drawings on a single sheet attached to a clipboard so that they're easy to check while I work.

Each list is valuable at different parts of the milling and construction process. When dimensioning stock, I have the second list close at hand because I don't need to know where the pieces go, just how many pieces I need of any one width and length. Then when I cut the joints, I move to the first list. It tells me which part needs a tenon and which needs a mortise. When I've fin-

The larger the project, the greater the potential for small errors to accumulate into big problems. A $\frac{1}{32}$ in. off here and a $\frac{1}{16}$ in. off there can result in the case not fitting together during final assembly. Consequently, you need to be very accurate with dimensions, squareness and flatness.

[illegible]

Quick drawings and cut lists save time and countless mistakes. Drawings and cut lists are used to double-check every stage of the construction process. The author sketches on plain white paper with a pencil as his only tool. Easy-to-read drawings show everything unique to the project (facing page). Cut lists tell the dimensions of every piece even before the first board is milled (above).

While I'm dimensioning stock (and cutting joinery), I keep similar parts in neat stacks (see the bottom photos on p. 86). Organized this way, they serve as a visual checklist. If I see one that is odd, I can make sure that there is a good reason. With this sys-

tem, I have caught many errors while there was still time to fix them easily.

When each piece is dimensioned, I label it according to its purpose and location in the finished case. If the orientation of the piece is important, I note it as well. This helps tremendously during glue-up when I'm in a hurry and don't want to spend the time figuring out whether I have the right piece in hand.

Simplified dado-and-tenon joinery saves confusion and time

Perhaps the most time-consuming part of large-case construction is the joinery. When each joint needs unique fitting, the work quickly becomes overwhelming. I solve this problem by limiting the joints I use to two very simple types and cutting each type all at once. I use either a dado-and-tenon joint or dowels. My doweling technique is conventional, but the dado-and-tenon joint I use is a considerable time-saver.

Instead of cutting a mortise to receive the tenon and a slot for the panel, I cut one 1/2-in.-deep and 1/4-in.-wide dado to serve as both. I glue the tenons into the dados during assembly, but I leave the panels dry. A single dado cut on the edge of a board takes only a few seconds, yielding two mortises and a panel slot. Chopping deep mortises to receive tenons and then plowing dados to receive panels would take considerably longer. Because the dados are perfectly even in width, fitting the joints is only a matter of making sure the tenons are the right width. For a strong glue joint between the dado and tenon, the parts should go together with moderate hand pressure but be reasonably difficult to pull apart. If you dry-fit two

STREAMLINED JOINERY SAVES TIME

It only takes a few machine setups to cut all the dado-and-tenon joints in a case. A single dado creates both mortises and panel slots. A dado-and-tenon joint offers more than enough strength to keep everything tight. After tenon shoulders are cut on the tablesaw, a double blade is used to cut both cheeks in a single pass (right).



pieces together and pick up one, the joint should stay tight.

I use the dado-and-tenon joint for almost all the framework in the case. The only exception is where the stretchers meet the front posts: There I use a 3/4-in.-wide and 1/4-in.-deep dado with dowels. I use a shaper to cut the dados, though a router or a tablesaw with a dado blade could do the work just as well.

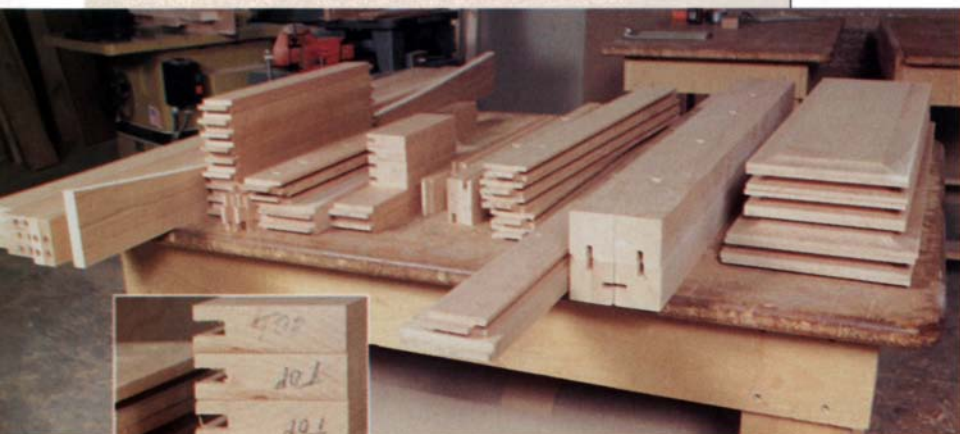
The fastest way I know to cut accurate tenons is on the tablesaw. The shoulders come first. I feed the piece over the blade with a miter gauge, using the fence to determine the width of the cut. I leave the blade low so that it doesn't cut into the cheek of the tenon and make it weak.

To cut the cheeks, I use a cast-iron Delta tenoning jig and a double-blade setup in the tablesaw (see the photo above). However, I don't use the 1/4-in. Delta spacer between the blades because it's exactly 1/4 in. thick. To cut a 1/4-in. tenon with double blades requires a thicker spacer to compensate for tooth set. I had a machine shop make a custom spacer to cut tenons that match the 1/4-in. dados perfectly (two-thousandths of an inch will affect the fit from too tight to too loose). This setup still needs to be shimmed for the exact fit, the same way you shim a dado gang. But with this setup, I can produce tight, reliable joints throughout the piece.

Breaking down the assembly process into manageable parts

It is not possible to assemble a nine-drawer dresser in one fell swoop. It can also be very difficult to assemble one piece by piece. My solution is to divide the case into a number of smaller frames, which I assemble first (see the photos on the facing page). The frames include the two sides, the back and six internal frames. All sections are flat

HOW IT STACKS UP



Neat piles keep everything in check. With all the parts in an organized pile, it's easy to spot a mistake at a glance. The author writes the purpose, location and orientation on each part, somewhere that won't show and won't be sanded off.

GLUE UP IN MANAGEABLE STEPS

It's far easier to assemble a large carcass in sections. Dry-fitting every part of a case ensures that glue-up won't present any surprises (left). Case sides are clamped up one at a time, double-checked for square and set aside until final assembly (center). Internal frames are set in the case sides one by one so final assembly doesn't become a frantic affair (bottom). Well-labeled parts, slow-setting hide glue and having tools nearby will help the process go smoothly.



and easy to assemble. Afterward, assembling the frames into the complete case is just as easy.

I always dry-fit each section to check the fit. I take this opportunity to make witness marks to indicate where parts go together. When I glue the parts together, the lines will guide me. If the dry-fit is clean, I take the subsection apart and assemble it again with glue. I use prepared hide glue for several reasons. I like it for its long open time, making one-man glue-ups simply hurried and not panicked. Also, the parts are easy to disassemble when repairs are needed in the future.

I've found that a small jig makes glue application less hectic. I drill a few $\frac{3}{16}$ -in. holes into a scrap of wood. I fill most of the holes with the glue I'll need for the assembly and leave a few of them dry to hold the glue brush when I'm not using it. This way, I don't have to squeeze glue out of the bottle each time I need a little more.

After I clamp up the frames, I check three things. First I check the diagonals. Then I check the flatness of the frames. If the diagonals are not within $\frac{1}{16}$ in., adjust the clamps until they are. If the frames are not within this tolerance, final assembly will be far more difficult and may result in a parallelogram-shaped dresser.

Preparing for a calm but quick glue-up

I find that the climactic final assembly of a large case is the most satisfying moment. It's when all the parts come together and start to look like something. But it's not the moment to rush. The time taken to dry-fit the assembled frames is always well spent. If the case is twisted, you'll know before drying glue has you under the gun. I use undersized dowels for the dry-fit, so I can get them back out for glue-up with full-sized dowels.

The key to a civilized glue-up of a large case is having everything

ready and at hand. I place all the clamps I'll need within reach and get the glue ready. I make sure that I have a mallet to persuade unwilling parts. Work I have put into the parts previously will come to fruition. If all of the frames are square, the case will be square. You do need to check the diagonals across the face. But don't chase your tail checking the squareness of each opening. There's no way to adjust them at this point. If all of the parts are labeled, it will be easy to figure out where they go. And if you use hide glue, you can take your time during glue-up to get it right.

The combination of these strategies will make it possible to move through the building process at a calmer pace and still finish a large case in less time. □

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Essential tools

If I had to guess, I'd say that I own about 350 woodworking tools collected over 27 years. Some work better than others, but at one time or another, I've used them all. In a given week, I probably use three dozen tools. For the novice woodworker, the tool selection in stores and catalogs can seem baffling, confusing and confounding.

Imagine this: You decide to take up woodworking, and this weekend, you are going with checkbook in hand to the woodworking store to buy some tools. Your budget is limited, and you will only be able to buy a half dozen items. Which ones will they be?

First of all, congratulations. Woodworking is a most satisfying pastime, so varied and multi-faceted you will never complete the twin processes you have undertaken: acquiring tools and learning how to use them. You have begun a lifetime pursuit.

Every journey begins with a first step that determines both your direction and the

experiences you will have along the way. Likewise, the tools you bring home are going to influence your approach to woodworking for a long time. You want to choose carefully. If I had to start over and acquire new tools—what fun!—here's what I'd get first.

Smooth plane: This is the most versatile of all woodworking planes, if not all woodworking tools. With a smooth plane—most models are 9¾ in. long and are referred to as a No. 4—you can flatten boards. You can thickness and surface wood. You can use it to shape some parts, and it will create some decorative features such as chamfers. Used in conjunction with a simple, shop-built device called a shooting board, a smooth plane will joint edges and square ends. As you progress in woodworking, you will find that one plane is not enough. I have at least two dozen under my workbench of various sizes and configurations.

But before you can use your plane, you have to learn to sharpen



For the novice woodworker, the tool selection in stores and catalogs can seem baffling, confusing and confounding.

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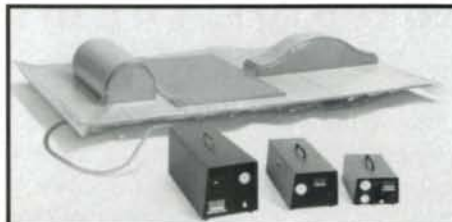
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Rules of Thumb (continued)

it. Sharpening is a gateway through which many woodworkers never pass. In failing to do so, they diminish the pleasure and satisfaction they could receive from their woodworking. They sacrifice efficiency because they cannot quickly do many simple jobs, such as picking up a handplane and trimming a final $\frac{1}{64}$ in. from a board. A woodworker who doesn't have a sharp plane is forced to perform an operation like this in complicated and time-consuming ways.

Sharpening is not hard to learn, and it has the added benefit of developing an understanding of what a sharp edge is and how it cuts. Learn how—there are as many methods as there are planes—and you're on your way to working wood. Trying to be a woodworker without knowing how to sharpen tools is like trying to be a sailor without knowing about the wind; it's almost impossible.

Tablesaw: Like the handplane, a tablesaw is a very versatile tool. It performs the obvious tasks of cutting wood to width and length. However, it will also cut some simple joints like miters and rabbets. By using common attachments you can acquire later, like a dado head and a tenoning jig, you can do much more.

larger. My point is that with familiarity, when a measurement is wrong, you will know it intuitively. It will nag at you and demand that you check it again, thus avoiding measurement mistakes.

Mortise gauge: This simple device lays out mortises and tenons and a variety of other joints used in woodworking. Learning to lay out joints reinforces an understanding of how they work. You develop a sense of what joints work best in certain applications and why.

The fine layout lines made by a mortise gauge bring you close to the wood in two ways: You get close to the wood to see your work, and you get close to the wood as a material. Wood has characteristics—grain, texture, color, hardness, strength—you need to understand if you are going to do fine work.

Set of chisels: These tools will help shape the mating parts of many woodworking joints and help fit them tightly. Chisels are made in lots of sizes, but to start off, I'd recommend buying chisels in the following sizes: $\frac{1}{4}$ in., $\frac{1}{2}$ in., $\frac{3}{4}$ in. and 1 in. Like the plane, chisels require you to learn to sharpen before you can use them. However, unlike the plane, the chisel gives you a

The tools you bring home are going to influence your approach to woodworking for a long time.

Buying and using a tablesaw will help you to resolve the hand-tool vs. power-tool dilemma that, unfortunately, divides woodworking into two camps. You do need both. By using your tablesaw, you will discover that the greatest value of machines is their ability to do repetitious labor. But they are more awkward and clumsy than hand tools when trying to do finish work. You'll find that you work most efficiently when you combine hand tools like the plane with a machine like the tablesaw to quickly produce the parts in your cutting list.



Ruler: It almost goes without saying that woodworking requires measuring. I suggest you begin with a 2-ft. metal ruler. Although you might eventually want a folding wooden rule or a tape measure—you may already own both—a metal ruler is more versatile. Besides measuring, it can be used as a straightedge when laying out work, and that same edge can check boards for flatness and straightness.

Many woodworking mistakes result from incorrect measurements. Learn to recognize by eye increments such as $\frac{1}{8}$ in., $\frac{1}{4}$ in., $\frac{1}{2}$ in. and a full inch. The same thing holds true for longer increments such as 6 in. and a foot. Twice in a recent Windsor-chair class I taught, students drilling $\frac{3}{8}$ -in. holes—the bits are marked with a 6 for $\frac{9}{16}$ in.—used the $\frac{9}{16}$ -in. bit because they were looking at the 9 upside down. If they had been familiar with basic increments by eye, they would not have made that mistake. Obviously, $\frac{6}{16}$ in. is smaller than $\frac{1}{2}$ in., and $\frac{9}{16}$ in. is

close-up, unobstructed view of the wood that's being cut. Chisels are unique in the way they involve you with the wood.

Dovetail saw: You will eventually own many types of saws. But beginning with this particular saw will affect your woodworking path. Its purpose is cutting joints, not just dovetails. Using it will not only help you develop an understanding of joinery but also give you a feel for sawing. And after a while, the way you use tools will become automatic. Larger handsaws require more muscle to use, and this overwhelms the tactile feedback. And when you use a power tool, you are as removed from the wood as an astronaut is from the atmosphere. You can concentrate better using a dovetail saw as you work slowly in a controlled manner, making short, easy strokes. With practice and observation, you'll learn all about wood and woodworking: cherry sounds different from pine when it's cut, maple smells different from oak, smooth cedar feels very different from smooth mahogany.

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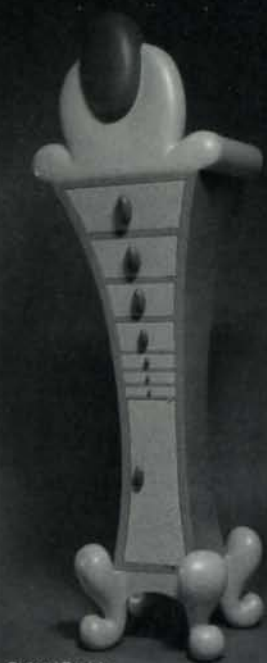
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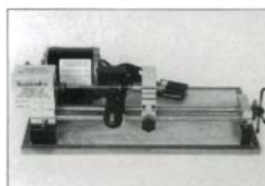
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Obtaining a crackle finish

Recently I saw a Pennsylvania German blanket chest. It was dovetailed together, beautifully painted and had a crackled finish that looked like it was 100 years old. The owner of the chest said this finish was accomplished with a kit, and the kits are quite expensive. How can I achieve this effect with generic ingredients? —Don Spittle, Beltsville, Md.

Jeff Jewitt replies: There are at least two techniques you can use to achieve a crackle finish—one that results in cracks in the top layer of paint and another that results in cracks in a clear coat over the top layer of paint. Without seeing the chest you describe, it's hard for me to say which one was used, but I suspect it's the latter. There are distinct aesthetic differences between the two techniques, so you may wish to experiment on sample boards before trying either technique on a finished project.

To crack the top layer of paint, you'll use a multi-step process described in depth in *FWW* #120, pp. 64-67. Briefly, you start by applying a base coat of latex or milk paint to the bare wood. It should be a color that will contrast with the topcoat. When this base coat is dry, apply a sealer coat of shellac. When the shellac is dry, scuff-sand, and then apply a coat of premixed liquid hide glue, such as Franklin's, over the shellac. Thinning the glue slightly with water will make the glue easier to brush. After waiting a few hours for the glue to dry thoroughly, apply a topcoat of paint. As it dries, cracks will form, exposing the paint below. You can speed up the process with a hair dryer. When the paint is dry, apply a topcoat such as shellac, varnish or lacquer to protect the painted surface.

The second method, in which the clear topcoat is cracked, uses two types of varnish, one over the other. It will work both as a clear finish and as a finish over a painted surface. First brush on a coat of oil-modified alkyd varnish. I use Pratt & Lambert clear #38, but many others will also work. Let this first coat dry until it's slightly tacky—usually about two hours.

You'll need to mix the second varnish because it's not commercially available. Dissolve one part gum-arabic powder (available from Chem-Lab Supplies;

714-630-7902) in two parts water. Heat this solution in a double boiler until all the gum arabic has dissolved, taking care not to let it come to a boil. Then remove it from the heat, and let it cool to room temperature. Add a few drops of dishwashing soap to help the solution flow more evenly, and brush it on over the tacky alkyd varnish. As the gum-arabic solution dries, it will crack. If cracks do not appear after several hours, a hair dryer set on warm will do the trick, but it's best not to force the process.

Wait a day for the gum arabic to dry fully; then accentuate the cracks by rubbing some artist's oil color into them, using a soft rag. I've used both Vandyke brown and burnt umber to good effect. Gum arabic is not very durable, so you'll want to apply a light topcoat of shellac to protect the finish.

[Jeff Jewitt repairs and restores furniture in North Royalton, Ohio.]

Worms first?

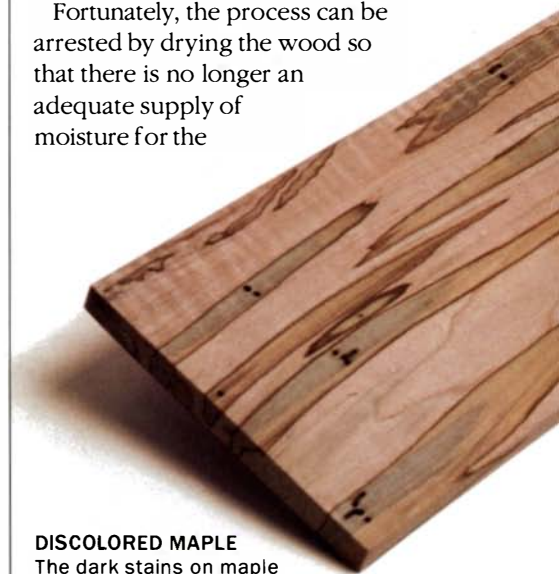
I often build furniture out of southern (soft) maple with the worm-scarred markings. Indeed, much of the maple in this part of the South has these "defects." What causes this? Do mineral deposits entice a worm or insect, or does the invasion of a worm or insect cause the mineral deposits? I suppose some woodworkers avoid using this wood. I find it attractive.

—Norman Ellis, Tuscaloosa, Ala.

Jon Arno replies: Worm damage is a common problem with all species of maples. This is because maple wood contains large quantities of sugar and other nutrients but is low in tannins and other compounds that help to ward off parasites. The larvae of certain beetles love the stuff and quickly infest it. This is especially true if the logs are allowed to sit in a warm environment for any length of time before being cut into lumber and kiln dried. Once the larvae invade the wood, the channels they leave behind provide access for the airborne spores of fungi. The dark stains then result as a by-product of the metabolism of these fungi. If allowed to progress too long, the fungi will expand into the surrounding wood tissue, eventually decomposing the wood to the point that it is no longer

structurally sound enough to use.

Fortunately, the process can be arrested by drying the wood so that there is no longer an adequate supply of moisture for the



DISCOLORED MAPLE

The dark stains on maple are caused by fungi that multiply in channels left by burrowing beetles.

fungi to multiply. Typically, the various molds and other fungi that attack wood become dormant as the wood's moisture content drops below about 18%. In the lumber trade, worm holes and stains rank along with knots and checks as defects in the wood that degrade its value, but among woodworkers, opinions vary. Like you, I personally am very fond of some of these "defects." For example, box elder that has been infected by the fungus *Fusarium negundo* sometimes exhibits coral pink streaks that are stunningly beautiful. Also, the black, brown and blue marble-like swirls found in spalted maple and ash look great, especially in bowls and other turned items.

[Jon Arno is a wood technologist and consultant in Troy, Mich.]

Metal and fumes in the dust-collection system

As I approach the time to turn on my new dust-collection system, several questions arise. I sometimes bore holes into iron at my drill press. Is it safe to admit these metal filings and chips into a vacuum drop? Also, can the system be used to remove low-level solvent fumes from the shop?

—Robert L. Bailey, Gainesville, Fla.

Curt Corum replies: When setting up an air-handling system, you have to be

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careful to make sure that whatever it will be handling is compatible.

In general, I don't recommend the mixing of unlike material in an exhaust system because it might start a fire or cause an explosion. Mixing wood with metal chips or filings, especially ones that are very hot from drilling, has the potential to create a spark, and more. When a spark comes in contact with finely divided dust particles or solvent fumes, the spark can cause the two materials to ignite.

Because solvent fumes can contain flammable vapors and often have an explosive nature, they shouldn't be mixed in the average dust-collection system. Volatile fumes, like those from solvents, thinners or lacquers are highly flammable. They have to be handled by a blower that is constructed of non-ferrous metals (usually aluminum) and is explosion proof.

Improperly used, a dust-collection system can defeat the purpose of using it in the first place. You should always consult with an air-handling specialist or the National Fire Protection Association (800-344-3555) before mixing materials in an exhaust system.

[Curt Corum is the technical sales manager of Air Handling Systems in Woodbridge, Conn.]

Cutting banding for a tabletop

I recently built a large cabinet with black banding inlaid around the top. Instead of using ready-made bandings cut with the grain, I cut a strip of veneer across the grain. I felt that this would allow the banding to move with the top without the danger of cracking. Do you think this was necessary?

—Jeffrey Zagan, Rochester, N.Y.

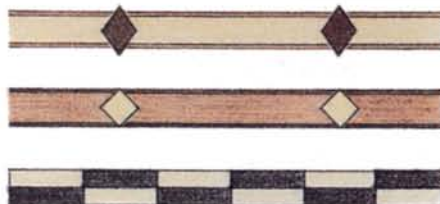
Garrett Hack replies: The idea of cutting your banding across the grain will probably work because the wood fibers now have the same alignment as the surface of the piece. But the banding is extremely fragile and difficult to inlay.

When inlaying across the grain in any large surface, seasonal movement must be taken into account. Because the inlay is thin, be it stringing or some assembled banding, it has some inherent flexibility much like veneer; however, inlay has

BREAK UP A BANDED TABLETOP



Using an inlaid banding with a non-continuous design allows for wood movement.



little resistance to real stress.

I learned this lesson the hard way when I inlaid a thin band around a modest oval table. Everything was fine until the table experienced months of high humidity, after which the inlay showed signs of tension failure along the curved ends. By the time the table had experienced some months of low humidity, the inlay buckled slightly, again on the ends. I knew there had to be a better way.

To prevent similar problems, I keep the sections of cross-grain inlay as short as possible, something like 12 in. or less, either by changing the design or using a non-continuous inlay. (This can be done by interrupting the banding at regular intervals with something decorative that allows the inevitable movement to take place as inconspicuously as possible.) If you really must have a continuous band, you might consider inlaying into a

veneered surface rather than solid wood. [Garrett Hack designs and builds furniture in Thetford Center, Vt.]

Nails across the pond

In your article, "A Game Plan for Big Cabinet Jobs" (FWW #127, pp. 82-87), John West writes, "We use 5-penny resin-coated box nails. The diameter is only a little larger than a 4-penny, but the length is almost that of a 6-penny nail." On this side of the pond (I am in England), nails are called by their measure in inches. Can you explain the terms used to describe nails in the United States.

—Eddie Kidby, Milton Keynes, Buckinghamshire, England

William Duckworth replies: The American practice of specifying nail sizes with the word *penny* dates back to our Colonial times, when we were still under the English crown and nails were sold by the hundred. To this day when stated in print, the English abbreviation *d*, for pence, is still used to indicate penny size. A 4-penny nail meant that you got 100 nails of that size for 4 pence. Inflation being what it is, the monetary value of the original nomenclature no longer applies, and nails are now sold by the pound.

Finishing nails—those with small heads—vary in size by 1/4 in.: A 2d nail is 1 in., a 3d nail is 1 1/4 in. and so on up to a 3-in. 10d. I think the current British practice of specifying nails by their actual length makes a lot more sense, but I'll never understand why you call clamps "cramps." [William Duckworth is an associate editor of *Fine Woodworking* magazine.]

What's your solution?

Do you have any suggestions to help prevent the sweating and resulting rust that occurs on some of my tools?

My workshop is in my drywalled garage, and heating it is out of the question. All my tools are currently held in wall-hung cabinets or closed wooden boxes. I have tried everything—keeping tools wrapped in cloth and/or leather, storing tools oiled or waxed—but nothing has prevented the problem.

It is disturbing to find a fine old plane, scraper or chisel coated in light rust—not my idea of patina. Are there linings, materials or a tool-storage design that will help fend off the rust?

—Gary Sullivan, Ripon, Calif.

Send your responses to: Q&A, *Fine Woodworking*, P.O. Box 5506, Newtown, CT 06470-5506. The best responses will appear in an upcoming issue.

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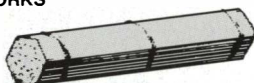
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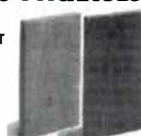
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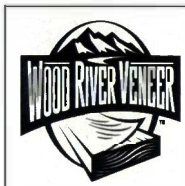
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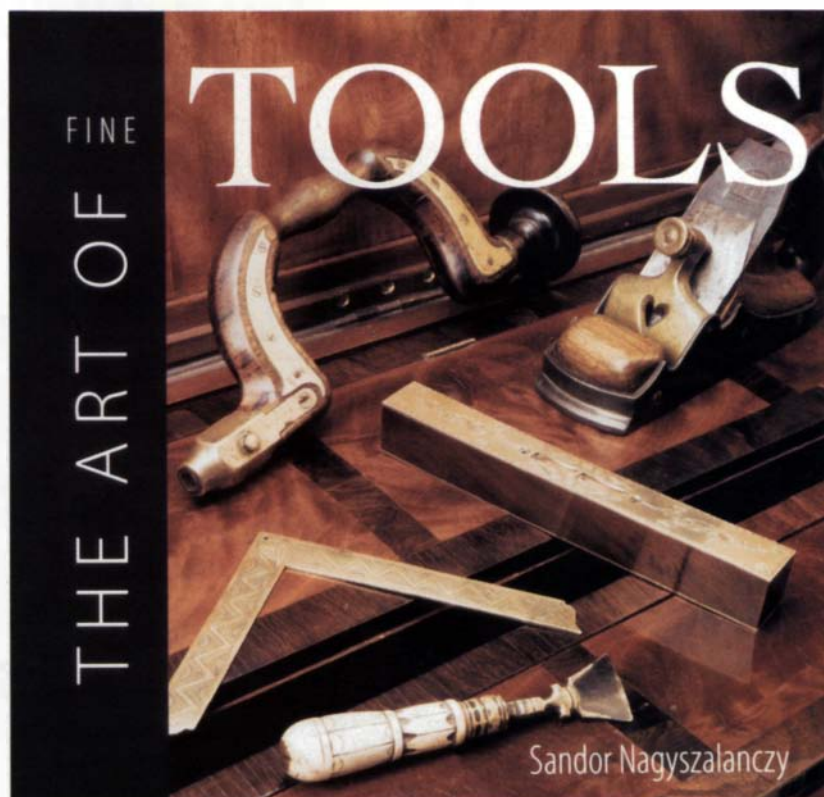
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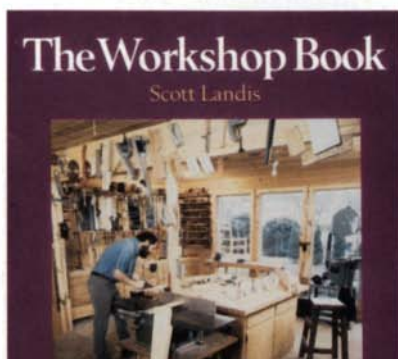
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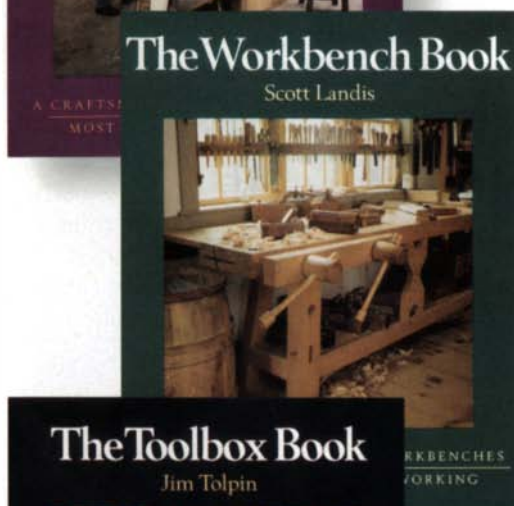
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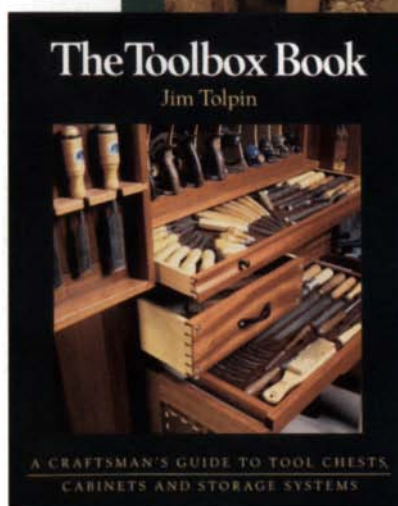
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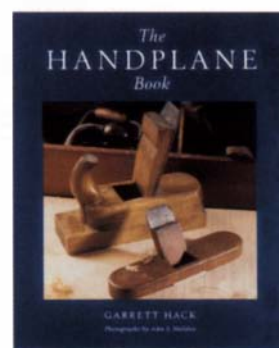
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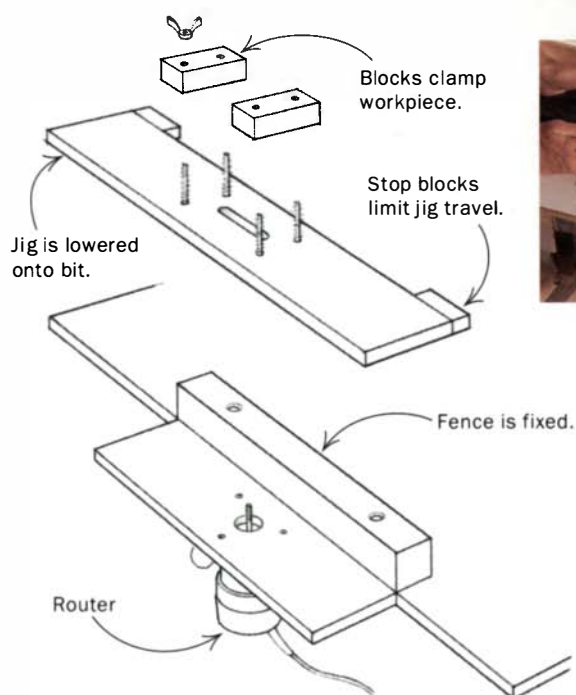
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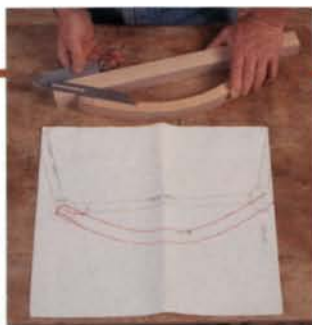


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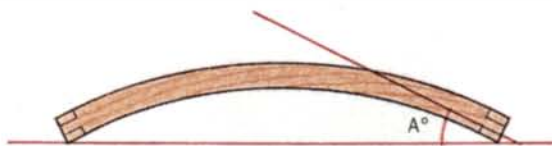
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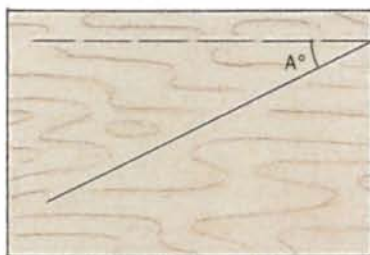


FRESH ANGLE ON TENONS

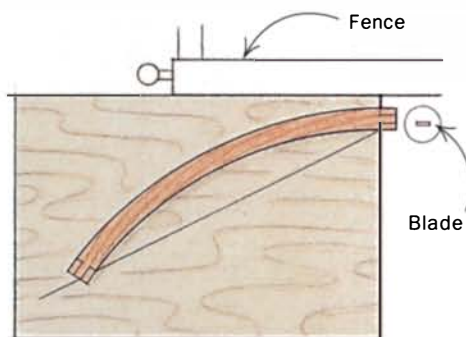
At the heart of Boggs' method of cutting angled tenons on curved parts is a fiendishly simple technique for positioning the workpiece on the jig.



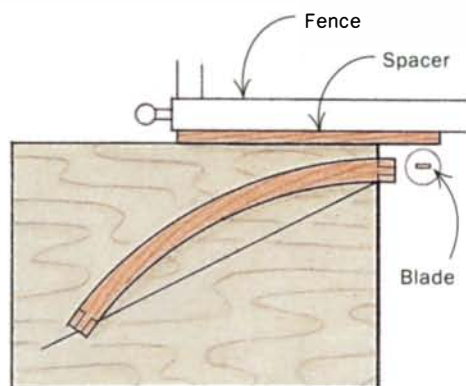
Strike a chord? Boggs begins by transferring the tenon angle from his drawing to the part.



Transference. The tenon angle is then transferred to the plywood carriage.



Crossing the line. The workpiece is placed along the angled line and clamped down. The line should intersect the workpiece at points equidistant from each end.



Spaced out. After the first cheek is cut, a spacer is inserted between the jig and the fence to cut the second cheek.



Hold me down. Boggs uses a screw, a cutoff from the workpiece and another scrap of wood to fashion a quick hold-down. The spacer (right) for cutting the second cheek of the tenon is sized to the thickness of the tenon plus the kerf of the blade.



wrestling with parts that curve, and I've had to come up with jigs to make those parts compatible with flat machines. For cutting joints on parts that I make over and over, I build dedicated jigs. But I also have a number of more universal jigs that could be adapted to any shop and to many uses other than chair making.

What all the jigs have in common is a simplified approach to locating the part on the jig. Instead of trying to cradle the curved part with a customized fence—which would introduce to the joinery any variations in the part—I skip the fence altogether and orient the part with layout lines, either on the part or on the jig.

For mortising, my most versatile jig is a board with a hole in the middle (see the drawing on p. 106). I use it in conjunction with a router table that has a fixed fence and a section of the table that juts out in front. To locate the part, I begin by laying out the centerlines of the mortises on the side of the part opposite the side to be mortised. I then use those lines to register the part on the jig. I clamp the part to the jig and, keeping the jig pushed against the fence, make a plunge cut onto the router bit. Stops on both ends of the jig limit the length of the mortise.

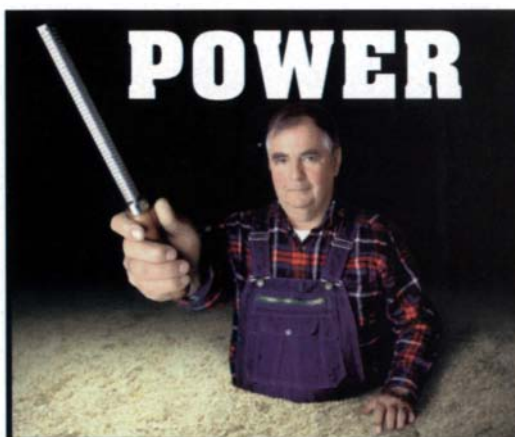
Whereas this mortising jig requires layout lines on the workpiece, my tenoning jigs use a line on the jig itself. This system is in its most basic form in my bandsaw tenoning jig, which is nothing more than a piece of plywood with a diagonal line drawn on it (see the drawings at left) and a simple hold-down. I start by jointing the part, then planing it. The part's flat sides must be parallel, because it will be flipped in the jig to cut the tenon on the other end. I place

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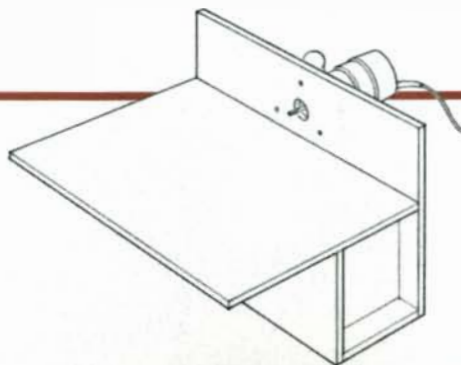
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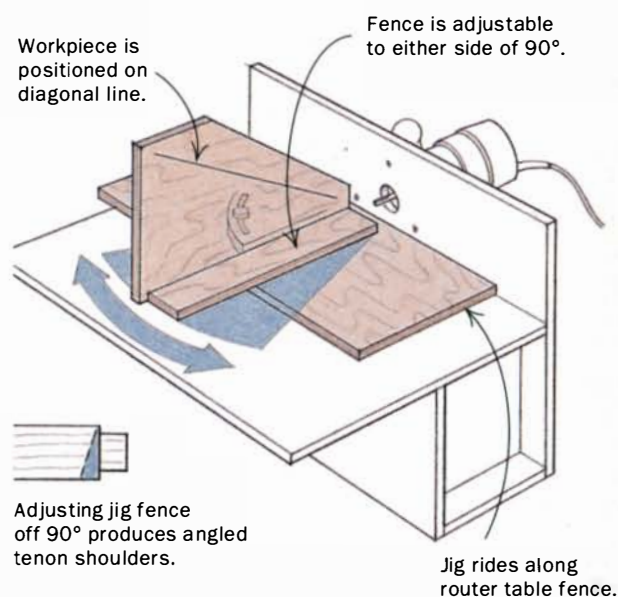
TENONING JIGS ON A ROUTER TABLE

Boggs cuts shouldered tenons on curved parts with a shopmade table for horizontal routing. The jigs he uses would also work with a conventional router table equipped with a high fence.



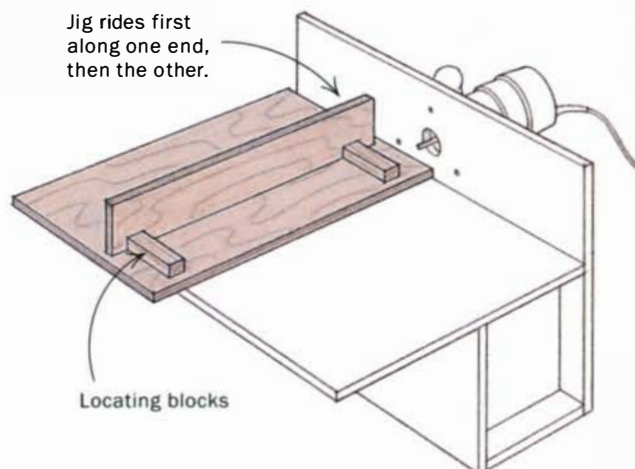
A JIG FOR ANGLED TENONS

To locate the part in this jig, Boggs uses the same angled-line idea as in his bandsaw jig. But here, the line is on a vertical fence and the fence pivots, so he can make tenons with angled shoulders.



A JIG FOR IN-LINE TENONS

With this jig, built just longer than the curved part, both tenons can be cut without unclamping the workpiece. The jig first rides along one end; then it's flipped to ride against the other.



Two points. The two blocks tacked to the jig are used only to locate the workpiece at two points equidistant from its ends. The workpiece is then clamped to the jig's vertical fence.

the jointed part on the diagonal line so that the line intersects the tenon shoulders. Then I clamp the piece and cut the tenon. To cut the second cheek, I insert a spacer that equals the thickness of the tenon plus the blade kerf.

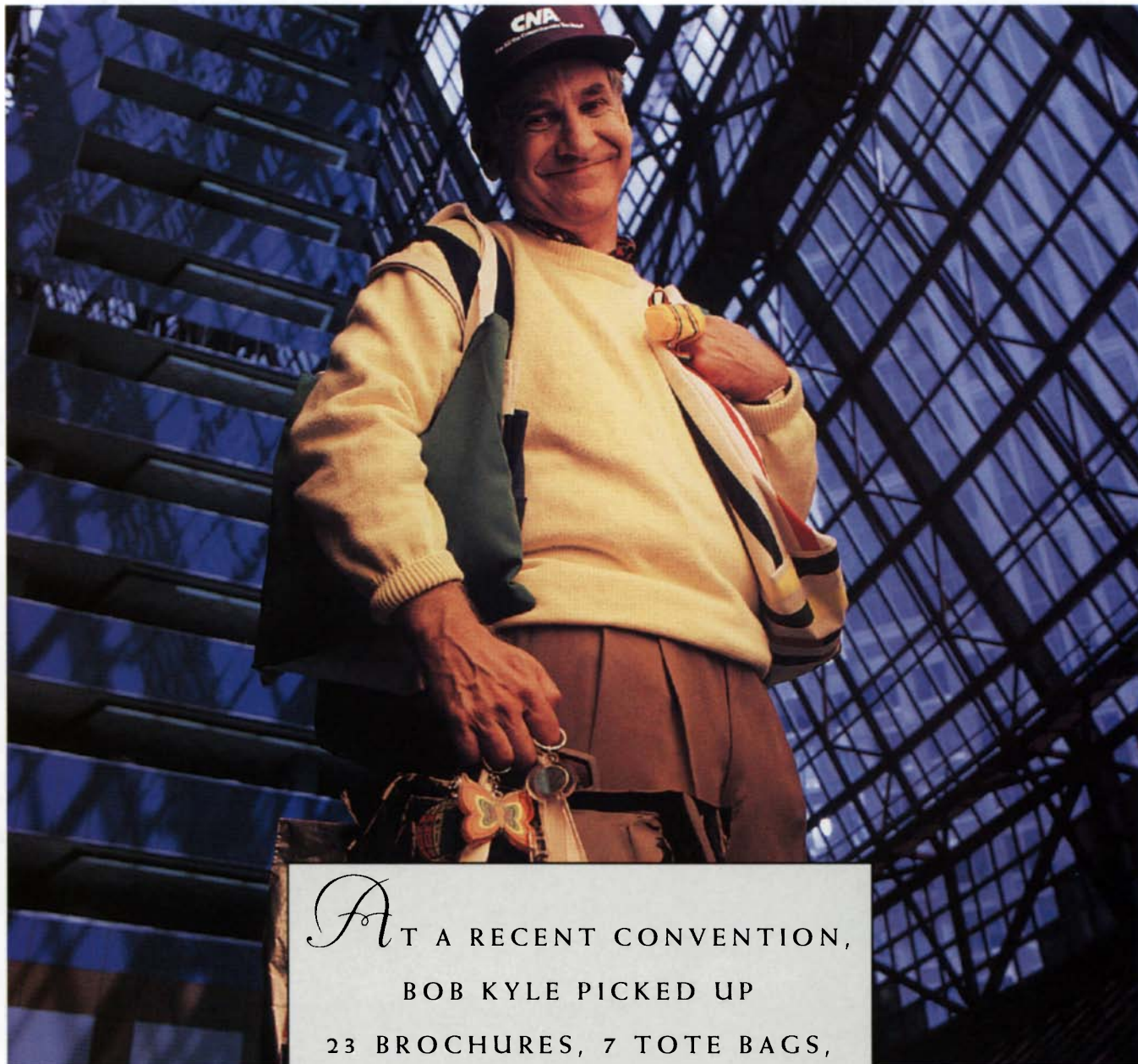
The bandsaw jig works well on parts like chair slats, whose tenon shoulders will be cut away. But for shouldered tenons, I often use the router table. For cutting tenons with a router table, I made a jig that is a higher evolution of the bandsaw jig. The method of locating the part is the same, but on this jig, the board to which the part is clamped can be adjusted to the left and right of 90°, enabling me to cut tenons whose shoulders are not square to the length of the workpiece (see the photos and drawings at left).

Here, again, the part is jointed before the joints are cut, and the second cheek is cut by inserting a spacer below the jig, which raises it up by the width of the tenon plus the diameter of the router bit.

I have a second jig for the router that I use for parts whose tenons are in the same plane. With this jig, I can cut both tenons start to finish without unclamping the part. Two blocks tacked to the jig take the place of a pencil line to locate the part. Because both tenons are cut without repositioning the part, they come out perfectly in line even if there is some twist or unfairness in the curve. The jig also guarantees that all the parts will have the same shoulder-to-shoulder dimension even if the overall lengths of the raw parts vary slightly.

Of course, a lot more can be said about cutting accurate joints on curved parts, but hopefully, these techniques will get you around the next bend.

—Brian Boggs, Berea, Ky.



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Up and down, that is. Gary Blaise, a San Francisco maker of early keyboard instruments, wanted a workbench low enough for handplaning but high enough for delicate assembly work. He put that request—along with five pages of others—into a letter to Seattle furniture maker Curtis Erpelding.

To give the bench its upward mobility, Erpelding put threaded rod in each leg and linked them with a chain tucked under the benchtop. Both vises, double dovetailed for brawn and beauty, run on twin-sprocketed shafts.

Erpelding's only regret? After packing the bench with improvements over the one he'd built for himself, he had to ship this one unused. To see Erpelding's shop, see pp. 50-55.



Photos: Mike Zens