AUNTON'S
Fine Woodworking

December 1993, No. 103
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Computer desk

Cordless drills

Paint-grade cabinets

Setting jointer knives

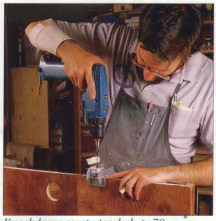
Secret Compartments

Fine WoodWorking®

November/December 1993 No. 103

DEPARTMENTS

ARTICLES



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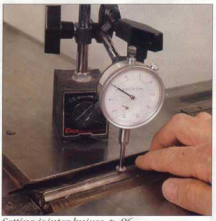

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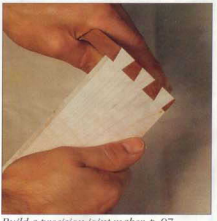

Build a precision joint maker, p. 97

On the Cover: *This 18th-century desk hides nine secret compartments. Secrets of their construction are revealed on p. 82. Photo: Amanda Merullo, courtesy Historic Deerfield, Inc.*

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Editor's Notebook

Video Takes take off—Over the last few issues, *Fine Woodworking* has been conducting what amounts to a mixed-media experiment. We have expanded beyond the printed magazine page to offer video tapes accompanying a few select articles. Much of what we do in the magazine involves trying to explain techniques, some of which can be complicated. Sometimes even simple tasks can seem more complex when put in print. It's like trying to give written instructions to tell someone how to tie a shoelace. We had a feeling that some subjects could really benefit from "moving, talking pictures," as Paul Roman, the magazine's founder put it.

The idea was to make short, simple video tapes that could be paired with articles to make a powerful package of information. These are not intended to be finely polished entertainment. Instead, each video functions more like a reliable old tool: There may be a few nicks in the handle, but it gets the job done. The tapes are shot by our staff editors in the shops of our woodworker/writers or in the Taunton woodshop. Editing and production are kept to a minimum and so is the price.

Techniques and tool reviews seem to be the natural topics for Video Takes. So far, we have done Tage Frid on veneering (FridVid 11030, $7), Sandor Nagyszalanczy comparing sliding compound miter saws (SawVid 11031, $10) and Peter Korn on preparing stock (PrepVid 011032, $10). In this issue, Robert Vaughan demonstrates how to set jointer knives (JointerKnives 011034, $10).

A fifth tape was intended to accompany the article about cove cutting on the tablesaw, which was featured in *FWW* #102. Unforeseen circumstances kept it from being released for that issue, but it is now ready. The tape (Cove Cutting 011033, $10) features assistant editor Jon Binzen demonstrating a wide variety of cove cutting techniques on the tablesaw, showing what a powerful shaping technique it is. That or any of the other Video Takes can be ordered by calling (203) 426-8171 or writing The Taunton Press Order Dept., P.O. Box 5506, Newtown, Conn. 06470.

Reader reaction has been positive to the tapes, and we will continue to offer them with the articles that especially lend themselves to the technique. Watch for the little Video Takes logo that appears at the beginning of an article. We think of the tapes as another useful tool for sharing important information between woodworkers. We hope that our readers see them as useful tools in their shops.

Valuable contributions—Something that has been an important part of this magazine since its inception is the advice and contributions of experts. People like Tage Frid, George Frank and R. Bruce Hoadley have lent their special knowledge to the magazine in ways that go beyond what appears in print. Their consultation and support have been important in consistently providing the kind of information woodworkers want and need from *Fine Woodworking*. That's why we have a special place on our masthead to recognize our contributing editors, who also include Christian Becksvoort, Robert M. Vaughan, Mark Duginske and Sandor Nagyszalanczy.

Each time we add a name to that list, which is not often, it represents a valuable addition to the magazine. That is certainly true of the newest name to be included. Mario Rodriguez is a nationally recognized expert on 18th-century woodworking. But his skillful approach to his craft goes beyond that period to encompass a diverse repertoire of techniques for both hand and machine tools.

Mario is also a natural teacher. He shows that skill both as an assistant professor in the Restoration of Decorative Objects program at the Fashion Institute of Technology in New York City and in teaching

his own popular workshops at his restored 18th-century farmhouse in rural upstate New York. His previous articles for *Fine Woodworking* also reflect his skills as a craftsman and teacher. Most recently, he was featured in these pages with advice about setting up a shop. We're sure readers will benefit from his knowledge for a long time to come.

New furniture book—An exciting new project begins with a call for entries ad on p. 19 of this issue. It is an opportunity for woodworkers to showcase in a book the kind of work that our readers keep asking for over and over again. *Fine Woodworking Home Furniture* will be a collection of finely crafted pieces for practical use. This is the kind of furniture most of us like to build for ourselves, our family and friends. It is the kind of furniture we can live with day after day, the kind of furniture that is at home in a home, not a gallery.

This won't be a picture book, and it won't be a book of plans. (And it doesn't replace our *Design Book* series; watch for a call for entries for *Design Book 7* in 1994.) Instead, it will be more of a practical idea book for those who want to build similar pieces. Each selection chosen by the editors and publishers of *Fine Woodworking* will be displayed with photos and information from the maker about the piece, an original design sketch or drawing and a short listing of overall dimensions, materials, finish and what special tools were required to build it.

We hope the book will inspire woodworkers to submit their best work and that work in turn will inspire other woodworkers who pick up the book to create their own fine furniture.

Award-winning writer—We measure the success of articles based on how useful and interesting they are to the woodworkers who read them. But sometimes our articles face a different measure through the scrutiny of professional organizations. One author, whose work has appeared in *Fine Woodworking* on several occasions, recently was honored by the National Association of Home and Workshop Writers. Jeff Greef, a woodworker from Santa Cruz, Calif., won first prize from the association for his article "How to Build a Barrister's Bookcase" (*FWW* #96).

Getting it straight—A couple of concerns surfaced after the publication of Peter Tischler's article "Using the jointer: the advanced class" in *FWW* #102, p.52. Both issues had to do with a technique Tischler described using a sharpening stone to resurface the jointer's knives. This technique, which requires the jointer to be on while a sharpening stone is held on the outfeed table, has long been used. Jim Cummins wrote about it in *FWW* #55, and it is included in the Powermatic owner's manual. However, it should be emphasized that this technique has the potential to be very dangerous. The use of a stop block on the infeed table, as pictured in Tischler's article, is essential.

The second issue is one of nomenclature. The point of the procedure is to put another bevel on the knives, so they may better surface figured stock without tearout. The article mistakenly referred to this as a "back bevel." In reality, the new bevel is formed on the same side of the knife as the original bevel, not the back of the knife. Consequently, it should more properly be called a "secondary bevel."

A tulip by any other name—An alert reader pointed out a typographical error in John Sillick's article "Tulip: Wallflower at the Hardwood Ball" (*FWW* #102). The correct Latin name for tulip, or yellow poplar, is *Liriodendron tulipifera*.

—William Sampson, executive editor

an effort in the latter part of the 19th century to produce a machine-cut joint with the holding power of hand-cut dovetails. Unfortunately, it lacks the superior mechanical lock of the dovetail joint. So as soon as mechanical means of cutting dovetails were invented, this joint faded into obscurity. Nonetheless, joints like this are invaluable aids in determining the age of antique American furniture. *–Jeff Jewitt, North Royalton, Ohio*

Tinnitus and ear protection—In *Fine Woodworking* #101, Mr. Joseph Matsko wrote in to say that he has tinnitus and that the use of ear protectors or a noise suppressor had not helped to prevent the exacerbation of his tinnitus when engaged in woodworking with power tools. My experience with tinnitus comes from the Tinnitus Clinic that we opened in our medical school over 17 years ago. We have seen over 4,000 patients with severe incapacitating tinnitus.

Joy O'Neal suggested seeing an audiologist or an otologist about custom-fitted ear plugs, and that's a good idea. Many custom ear plugs, however, come with a small hole bored through, so insertion will not trap air and produce an improper or uncomfortable fit. What most dispensers do not tell you is that once the custom-made ear plug is in place, the small hole should be plugged (a round tooth pick will do or a small piece of chewing gum) to maximize the sound shielding. Also, as we chew and talk, we move the ear canal. Movement of this sort tends to break the seal of well-fitted ear plugs, so one should periodically reseat ear plugs by gently pushing inward on them.

Ms. O'Neal suggested Mr. Matsko should contact the American Speech-Language Hearing Association. I would respectfully suggest that it would be more to the point to contact the American Tinnitus Association (P.O. Box 5, Portland, Ore. 97207).

One final comment about ear protection. When we have patients with problems similar to Mr. Matsko's, I feel it is essential that they continue with their woodworking. Thus, we tend to go to extremes to protect those ears rather than have the patient give up what to me is one of the finest of hobbies.

The susceptibility of humans to hearing damage from exposure to loud sounds varies enormously. Thus, that which protects one person may not protect another. If all forms of ear protection fail to prevent an exacerbation of Mr. Matsko's tinnitus, I would suggest that he try operating his power tools in short spurts. Hearing damage produced by loud sounds is a time-intensity function, and if it is not possible to sufficiently reduce the intensity, then perhaps reducing the duration of each exposure will help. If even operating in short spurts fails to prevent exacerbation of his tinnitus, I would suggest that he resort to the use of manual tools only as did our forefathers who produced some magnificent specimens of woodworking.

–Jack Vernon, Ph.D., professor of otolaryngology, director, Oregon Hearing Research Center, Oregon Health Sciences University, Portland, Ore.

More on ear protection—The prevention of loud noise exposure in woodworking is twofold: First, personal protection is critical and can be maximized by using a combination of molded custom-fitted ear plugs and ear muffs. The ear muffs should have fluid-filled bumpers that conform to the side of the head, even around eyeglass bows.

Whenever selecting hearing protectors, you should always find out the device's Noise Reduction Rating (NRR), which is the approximate expected reduction in sound loudness measured in decibels. Look for devices having a NRR of 25 or greater.

The second component of a noise avoidance program should be aimed at reducing the noise being produced. This can be done in several ways, starting with tool purchasing. In general, high-quality, heavy tools tend to be quieter. Some manufacturers are even emphasizing the quietness of their tools in advertising. Try tools before buying.

Tool installation should be designed to minimize vibration, (e.g. lag screw equipment to the floor using rubber spacers between machine leg and floor). Also pad rattling metal on metal components, such as machinery cabinet doors.

Further noise reduction can be achieved by eliminating the bouncing around of noise in the shop. Wood, masonry and metal are all sound reflectors and, as such, intensify noise. This can be greatly reduced by the use of sound absorbers. For example, hang a few framed acoustic tile panels vertically, and cover bare walls with cork.

With the exception of hammering, hand-tool use is much quieter than power tool use and should be used whenever feasible, such as using a cabinet scraper rather than a belt sander.

–Theodore J. Fink, M.D., Shelburne, Vt.

Clearing a clouded finish—I would like to respond to Don Steinert's answer to Uhle Cassidy's question on a clouded piano finish in *FWW* #101. Mr. Steinert incorrectly assumed that the cause of Mr. Cassidy's problem of a sticky and clouded surface was the breakdown of the surface coating. Mr. Cassidy clearly stated that the surface became that way after years of polishing and waxing.

Traditionally, most factory-produced pianos are coated with nitrocellulose lacquer. We know that we have a substantial surface coating to work with. So it is clear to me that the real culprit of the clouding and stickiness is the years of self-admitted oiling, polishing and waxing, not the surface coating itself. Mr. Cassidy's problem is not necessarily restoring a damaged finish but a question of how to clean all those years of accumulated oils and spray waxes and polishes.

Mr. Steinert's statement that the products that advertise themselves as "finish restorers" will not give the desired effect is correct. These materials are merely strippers without the methylene chloride and can damage a surface and should be avoided.

We have been experimenting with automotive polishing compounds as an alternative for some time and feel it would be a practical solution for the weekend restorer. We first began using Ditzler DRX 24 and DRX 25 (25 is the finer abrasive) but have also began using Meguiar's MO-4 and MO-1, which seem to work as well. These products do not have any silicone in them, and they are available where automotive paints are sold.

The only problem that could arise from the use of this treatment is that if the surface coating has begun to severely craze, the very fine abrasive may become lodged in the cracks. However, mineral spirits has proven helpful in washing it away.

Some key points to remember are that you must have an intact and stable resin-based surface coating. You are cleaning the surface, not attempting to amalgamate the surface coatings. This technique will not work on historic oil and wax surfaces. Always test in an inconspicuous spot to see results. And because you are working with an aliphatic hydrocarbon, always vent the area thoroughly. *–Craig Deller, Deller Conservation Group Ltd., Geneva, Ill.*

Chemical comments—Here are some comments on chemical subjects discussed in *FWW* #101 p. 65. Phil Lowe's description

of Sal-Soda as an impure form of sodium carbonate is incorrect. Sal-Soda is an old-fashioned name for sodium carbonate, also called washing soda. Some years ago, *FWW* published a letter suggesting washing soda for cleaning gum from sawblades. I could not find it anywhere. Since then, the emphasis on non-phosphate cleaners has brought it back to the supermarket shelves. I recently bought a 3-lb., 7-oz. box of Arm and Hammer washing soda for $1.44 (42 cents a pound).

Chris Minick ("Changing the Color of Wood," p. 66) must have forgotten the basic chemistry lesson found even in elementary school science texts. When you react chemicals, the properties of the products are greatly different from those of the starting materials. The classic example is the reaction of sodium, a metal that reacts explosively with water, and chlorine, a green, poisonous gas (the first chemical warfare agent) to produce sodium chloride, table salt.

The earliest synthetic dyes were derived from aniline, but contained no aniline. Aniline is derived from benzene and is reacted with other chemicals to make isocyanates used in products far more common than aniline dyes ever were—polyurethane foams and polyurethane finishes.

–David W. Carnell, Wilmington, N.C.

Why outdoor finishes fail—The article, "Wood Against Weather," by Jim Tolpin (*Fine Woodworking* #100) had some excellent tips on managing wood outdoors. However, the main reason for failure of exterior finishes was never discussed, and I believe the implication that six or seven coats are better than two or three is inaccurate. The critical factor that determines failure of exterior finishes is that water gets under the finish somehow. In other words, the door that's pictured on p. 91 of the article most likely didn't have the finish fail because of some mystical exposure to weather. Rather, the most likely scenario is that the bottom of the door wasn't adequately sealed, or the seal was broken from wear, weather or stripping. Water on the door surface ran down to the lower edge, found the flaw and, by capillary action, ran back up the inside of the lower part of the door. When the sun hit the door, the water heated up, evaporated and lifted the finish off. This is why only the lower part of the finish is damaged. If there were 20 coats of varnish, it still would have lifted off.

Also, too many varnish coats can actually cause a leak because they will crack more easily than two or three coats. This has major practical implications and has helped me maintain the doors and outdoor furniture in our Oregon weather for many years.

–James S. Puterbaugh, M.D., Portland, Ore.

Scratch awl simplified—Regarding "Scratch Awl from Scrap" (*Fine Woodworking* #100, p. 56), some people may not feel comfortable turning metal on a wood lathe or may cringe at the thought of shaping brass with a skew. These people may find the project more enjoyable if they buy a cheap awl with a plastic handle and then remove the handle.

–John Owen, Magnolia, N.J.

Less than perfection—I am writing this letter to comment on the Shaker-style wall clock article by Phil Lowe (*FWW* #101). I find the craftsmanship of his clock appealing but his lack of authenticity in using a battery movement inappropriate.

As a builder of Shaker clocks, I commend Mr. Lowe for using a custom-painted dial, complete with a key-wind hole, but the clock loses its aesthetic value when he uses the battery movement without a pendulum. It shortchanges the legacy of true Shaker craftsmanship and detracts from the Shaker tradition.

If someone is going to go to the effort of creating such a beautiful piece in the Shaker tradition, it is imperative that it be completed as close to the original as possible to maintain a high standard of Shaker ethics. The Shakers believed in perfection in their work, and anything less cheapens the meaning of the Shaker craft. The battery movement is a cheap substitute for an authentic key-wound movement. A key-wound movement gives a clock a real heart.

The only catalog offering Shaker dials at present is Precision Movements (4283 Chestnut St., P.O. Box 689, Emmaus, Pa. 18049; 800-533-2024). Their dials are available in Arabic numerals and Roman numerals. I am selling a Roman numeral dial. Interested persons can contact me at Worth Clockmakers (239 E. Orange St., Lancaster, Pa. 17602; 717-397-0552).

Key-wound movements are available from Butterworth Clocks (1715 Pearlview Court, Muscatine, Ia. 52761; 800-258-5418). The pendulum and other parts needed are available through Merritt's Antiques (P.O. Box 277, Douglassville, Pa. 19518; 215-689-9541) and Timesavers (P.O. Box 12700, Scottsdale, Ariz. 85267; 602-483-3711).

I hope your readers find this information helpful if they desire to build a clock.

–Robert Worth, Worth Clockmakers, Lancaster, Pa.

In defense of diamond stones—With regard to the article "A New Angle on Whetstones" (*Fine Woodworking* #101, p. 72), I have a few thoughts on the subject: I believe Gerald Polmateer was a little dismissive of diamond stones.

The American-made DMT "stones" are mounted on a reinforced plastic base that I have found very stable and rigid. While I agree they are not particularly fine, I find the 600-grit ideal for turning tools. Though I am almost entirely an oilstone addict, I find waterstones better for turning, being less messy from the frequency of sharpening required.

However, my main reason for buying the diamond impregnated stones was to at last have a master surface available to surface all other stones on. This has proved to be a success, and all my other stones are equally flat now. Now I can pass from a fine India to a Washita to a hard White Arkansas and get a consistent polish on the back of large paring chisels and especially plane irons. For me, after nearly forty years, this was a first.

Initially, I used a 325-mesh blue-series hone to flatten all my stones, and I kept them flat and open-pored with the 600-mesh red series. The company makes an extra-coarse 220-mesh black series, and I understand now a fine one at around 1,200-grit. To waterstone users, diamond stones make short work of flattening these soft stones.

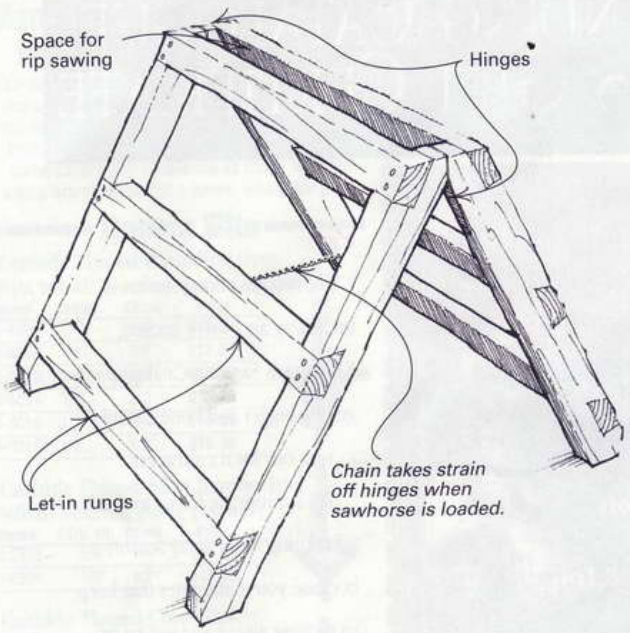
–Barry M. Murphy, Herstmonceux, East Sussex, U.K.

About your safety:
Working wood is inherently dangerous. Using hand or power tools improperly or neglecting standard safety practices can lead to permanent injury or death. So don't try to perform operations you learn about here (or elsewhere) *until you're certain that they are safe for you and your shop situation.* We want you to enjoy your craft and to find satisfaction in the doing as well as in the finished work. So please keep safety foremost in your mind whenever you're in the shop.

–John Lively, publisher

edited and drawn by Jim Richey

Folding sawhorse



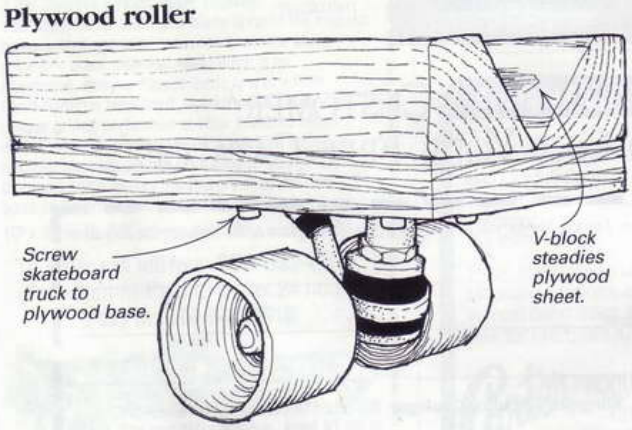
After experimenting with many sizes and shapes of sawhorses over the years, I finally designed and built this folding horse, which is easy to store and transport. When opened, it serves as a steady horse with a ripsaw space at the top. It also doubles as a sturdy step ladder. Two horses can support low scaffold planks or a workbench top. An added bonus is the clean design, which makes the sawhorse attractive and easy to construct.

To make the horse, dress 10 pieces of pine 1½ in. by 3 in. by 30 in. long. Bevel-rip six of the pieces at 30° for the steps. To mark out the notches and angle cuts on the four legs, first make an accurate template of thin plywood. To ensure rigidity, cut the leg notches carefully to receive a press fit. Press the steps into the leg notches with bar clamps, and fasten with countersunk flathead screws. You may wish to round the exposed edges of all pieces to reduce splintering and improve the looks.

Now mount the hinge. This may be easier to do if you remove the hinge pin, mount the hinge halves and then replace the hinge pin after lightly peening for a tight fit. Fasten a suitable chain between the centers of the middle steps to take the strain off the hinges when the horse is used under load.

–H. M. Smith, Napanee, Ont., Canada

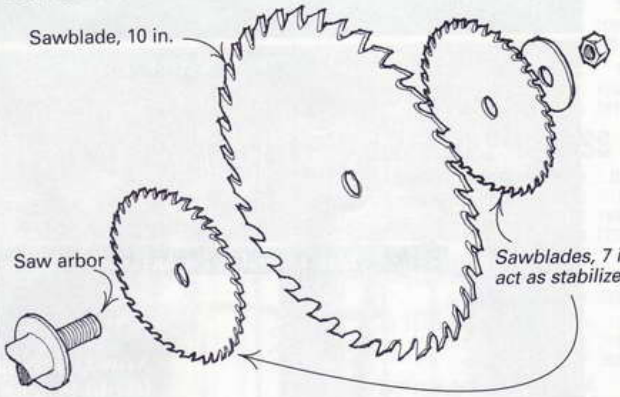
Plywood roller



For the expenditure of a few bucks and a few minutes, you can roll those plywood sheets instead of carrying or dragging them. Screw a couple of beveled 2x4s to a chunk of ¾-in. plywood to make the V-grooved base. Then mount a skateboard truck to the bottom so that the wheels are centered.

–Thomas K. Wilson, San Diego, Calif.

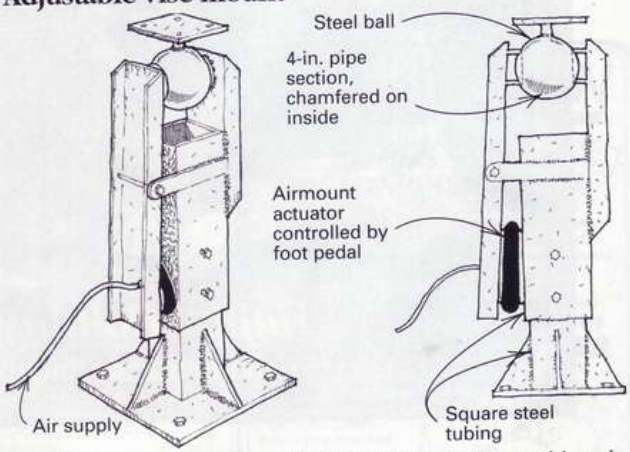
Sawblade stabilizers



When I began experiencing some blade wobble and vibration problems on my tablesaw, I looked into but rejected a set of expensive mail-order blade stabilizers. Later, I noticed a couple of used 7-in. circular sawblades hanging around the shop waiting to be sharpened. I sandwiched my 10-in. tablesaw blade between the two smaller blades to act as a stabilizer. The arrangement solved my blade wobble and vibration problems. I'm sure that smaller diameter blades, which would provide a greater cutting depth, would also work effectively.

–Les Barna, Indialantic, Fla.

Adjustable vise mount



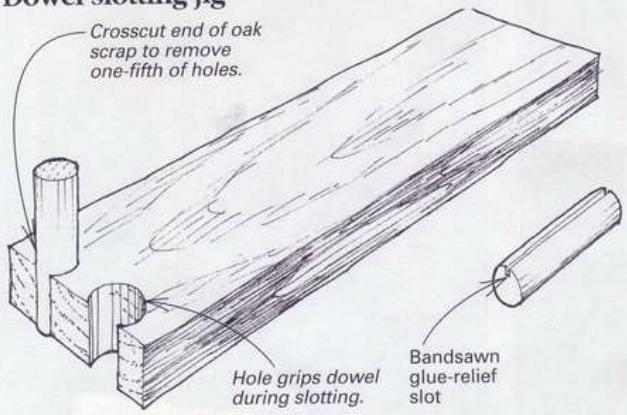
I needed a way to mount and hold sculpted chairs at odd angles while I was working them with a pneumatic drum sander. The device I finally came up with works great for this purpose, and it makes an effective adjustable vise mount or carver's screw mount. For the pivoting head, I used a steel ball made at a ball mill. A bowling ball would probably work just as well. Chamfered 4-in. pipe on either side holds the ball in place, as shown in the drawing above. I welded the stand from sections of heavy-gauge square steel tubing and plate. I then bolted the base plate to the floor.

There are two ways to provide the clamping leverage: a regular bench screw or an Airmount air actuator. The actuator, available through industrial air equipment suppliers (call Firestone Industrial Products at 317-580-2300 for information), is basically just a tire between two steel plates. Add air, and it tightens the grip on the pivoting head. The device is perfect for this application

because it exerts tremendous force on the ball (about 1,000 lbs. at 40 psi), and it puts up with lots of angular misalignment. I installed a foot-pedal air valve so that both of an operator's hands remain free to adjust the stand. —*Chuck Waugh, Boring, Ore.*

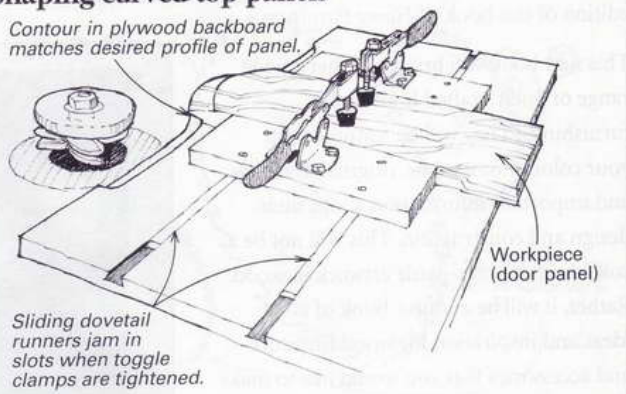
Quick tip: When dowel pins are too tight for comfort, bake the pins in a 200° oven for several hours. The pins will shrink just enough to fit easily during assembly, but during glue-up, they will swell to their original size to make a tight joint.
—*David J. Loy, Columbus, Ohio.*

Dowel-slotting jig



This simple jig has but one purpose: to help in cutting a glue relief slot in regular lumberyard dowels. To make the jig, simply drill a couple of dowel-sized holes near the end of a beefy scrap of oak. Then crosscut the piece removing about one-fifth of the hole, leaving four-fifths to grip the dowel. Now insert precut dowel pins in the proper-sized hole, and push into the bandsaw to slice a shallow slot. —*Steve A. Balla, Bramalea, Ont., Canada*

Shaping curved-top panels



When shaping curved-top panels for cathedral-top cabinet doors, I use the standard approach—a plywood jig with a curved contour cut into its top, which guides along a ball bearing rub collar mounted below the shaper cutter. But for the jig to work properly, you have to eliminate any side-to-side movement in the workpiece as it's being shaped. My original solution to the problem was to use fixed blocks attached to the plywood jig on either side of the workpiece with DeStaCo toggle clamps mounted on the blocks. I would cut filler strips to wedge between the blocks and the workpiece to center the work and to

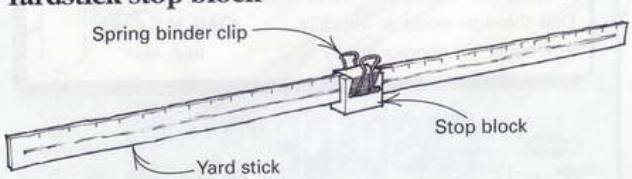
keep it tight. As the panel widths changed from door to door, I would cut new filler strips. Any panel that went beyond the capacity of the toggle clamps meant that I had to unscrew the blocks and reposition.

Finally, I redesigned the jig by mounting the plywood blocks to sliding dovetail runners. After centering the workpiece, I slide the blocks into position on either side of the workpiece and toggle the clamps down. The clamping pressure lifts the sliding dovetails, which wedges them into the slots and clamps the whole thing tightly. Then I'm ready to shape.

The combination of sliding dovetails and toggle clamps has promise for holding down materials in other applications, too.
—*Tom Griffin, Dublin, Calif.*

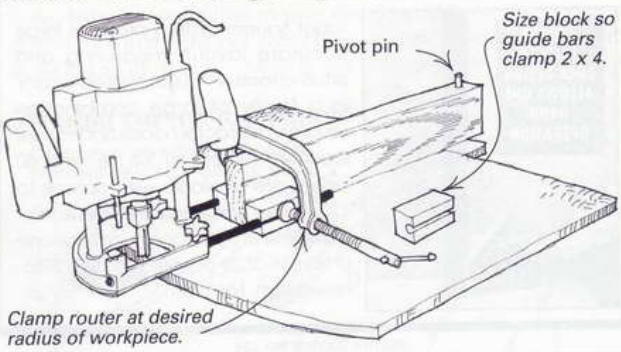
Quick tip: Slip a short length of split garden hose on the wire handles of plastic buckets to make them more comfortable to carry. Wrap electrical tape on each end to keep the hose in place.
—*John A. Wilson, Lexington, Mass.*

Yardstick stop block



To reproduce measurements that exceed the capacity of your combination square, make a simple stop block for a yardstick. Attach and adjust the block with a spring binder clip.
—*Harold D. Rodden, Florissant, Mo.*

Router circle-cutting simplified



Although I've seen dozens of methods for routing circles over forty years of woodworking, the method I stumbled on early is still the least complicated and quickest I've seen.

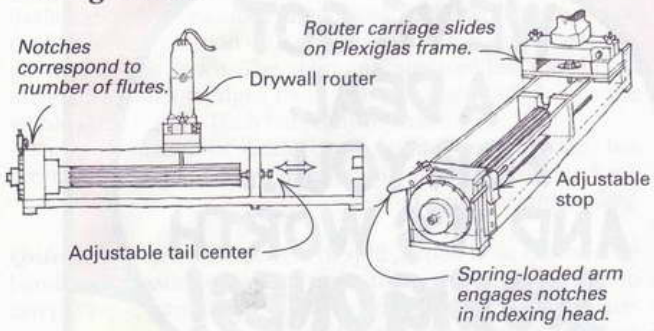
Two small hardwood blocks kept right in the router storage case are the heart of the method. The blocks slip on your router's guide bars leaving a bit of the bar exposed, as shown in the sketch above. When the blocks are in position, the distance between them should be 1⅝ in., the thickness of a 2x4, so that any length ripped from a 2x4 can be used to size the radius of the circle to be cut.

To cut the circle, drill a ¼-in. pilot hole in the 2x4, and use a dowel or ¼-in. bolt on a block as a pivot. Or just drive a nail through the 2x4 if the hole won't show. Adjust the router so the bit is in position; then clamp the 2x4 between the blocks and the guide bars with a C-clamp. The open holes in the blocks allow the pads on the C-clamp to pull up tight on the guide bars with-

out slipping off. With this system, you can rout circles as small as 6 in. to as large as...now let's see, what's the length of a 2x4?

–Tim Hanson, Indianapolis, Ind.

Fluting fixture



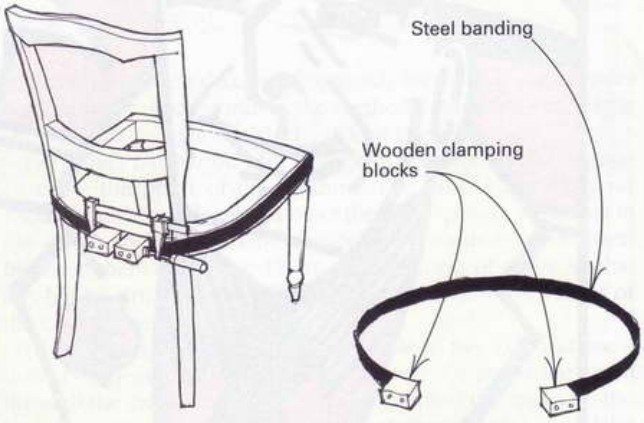
Fluting is an operation that is so seldom required that it does not warrant buying special equipment for the purpose. So when I needed to flute some short columns, I made this fluting fixture from a drywall-trimming router, hardwood scraps and Plexiglas. The construction details shown in the sketch can easily be modified for your particular needs.–*Harry J. Gurney, Taunton, Mass.*

Installing drawer fronts

Installing drawer fronts in European-style cabinetry (where drawers and doors are flush with the surrounding frame) can be tedious. To look right, the drawer front must be centered in the space with a perfectly uniform gap on all sides. This technique makes the installation fast and foolproof. With the drawer box installed in the case, temporarily position the front so that the gap, top and bottom is equal. I use metal rulers of various thicknesses as shims to adjust the vertical spacing. Leaving the shims in place, pull out the drawer front, and apply a couple of beads of gap-filling Super Glue to the back. Give the drawer box a spritz of accelerator. Position the parts together, eyeballing the side-to-side spacing. In about 20 seconds, you can open the drawer and install screws to permanently attach the front.

–Andrew Jacobson, Petaluma, Calif.

Clamping with metal strapping



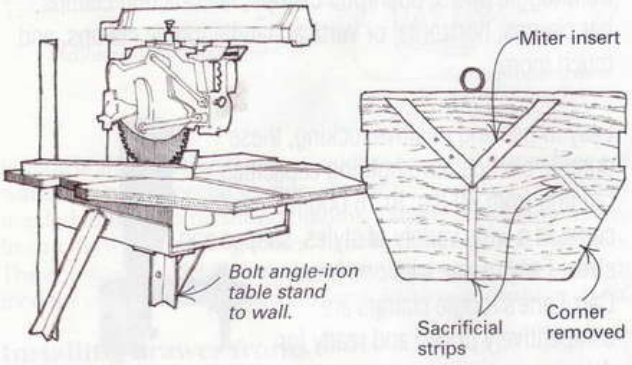
When I needed a large number of expensive webbing clamps for a run of chairs, I improvised this clamp. First retrieve a su

Methods of Work (continued)

ply of metal strapping from the lumberyard scrap bin. Cut the strapping to the approximate length needed. Attach wooden blocks to each end with 3/16-in. bolts and nuts. Use a C-clamp or Quick-Grip clamp to tighten. *–Chris Marley, Kingston, Jamaica*

Quick tip: When repairing antiques or patching veneer, it is often useful to see the repair as you apply clamping pressure. To accomplish this, place a piece of ¼-in.- thick clear plastic between the joint and the C-clamp. Wood glue will not stick to most plastics. *–J. Francis Pfrank, Schaumburg, Ill.*

Radial-arm saw tips



miter cuts easier to make and more accurate as well.

The first idea is deceptively simple—I cut the corners off the front of the wooden table. The saw's table needs to be quite long at the back, near the fence, but the front is rarely used. So losing the corners makes moving the machine a lot more pleasant without affecting its ability to support the timber being cut.

The second idea is more involved because I have thrown away the legs and mounted the machine on the wall 48 in. from the floor using welded up angle-iron brackets as shown. This sounds rather tall, but after the initial "shock period," I have found it easy and pleasant to use. Mounting the machine this way creates valuable space underneath the machine, which I use to store another tool when I need floor space.

To ensure good support underneath the cut, I have routed trenches ¾ in. wide by 3/16 in. deep along both the 90° and 45° cuts. These grooves are filled with well-fitted hardwood strips held in place with double-sided tape. I prepare several pieces of these "sacrificial" strips at the same time and fit a new one when support is particularly needed.

To cut miters, I remove the insert behind the main table and replace it with the fixture shown in the sketch. Leaving the arm in the 90° position, I miter the first piece by holding it against the left fence. The second piece is mitered using the right fence. Even if each angle is not exactly 45°, as long as the fixed angle between the fences is 90°, perfect miters are achieved.

–John Burchett, Copnor, Portsmouth, England

Restoring flooded equipment

What steps do I need to take to restore my shop after it has been under water? ***—Millard Upson, St. Charles, Mo.***

Robert Vaughan replies: Flooded equipment has two major problems that must be addressed: mud and rust. Flood mud is a pervasive residue of very fine abrasive silt that gets in everywhere. The thickness of the layers varies according to how muddy the water was. Rust is the other enemy and is probably easier to deal with.

Begin by cleaning the machine as best as possible. Take the machine out, and remove the motor and other electrical devices. Hose the silt off the machine with clean water, and wipe off all the standing water possible. Blow things out with an air compressor if you can, but chances are the compressor was flooded, too. Now you're ready to work. Soak fasteners and shafts with WD-40 or some other good penetrating oil and moisture blocker. Things rust up quickly and disassembly is eminent.

Grease holds the fine abrasive silt very well, so anywhere there was grease, there is now a viscous abrasive compound. Remove and replace all ball bearings no matter how free they feel or how sealed up you think they were. That fine abrasive silt will eventually get to them and may cause other mechanical damage as they fail. Any gearbox must be disassembled and thoroughly cleaned of its existing grease. Shafts that run through bronze bushings should be removed and both shaft and bearing surfaces wiped squeaky clean and then greased. Tables must be removed and their trunnion and worm gears cleaned and greased. All working parts will have that abrasive silt in them, and they should receive your attention to prevent excessive wear.

Motors will have to be disassembled and cleaned, and their bearings need to be replaced. Commercial motor shops "bake out" flooded motors by placing them in an oven at low heat for a period of time to remove the moisture.

Switches should be disassembled and the contact points cleaned thoroughly. If the switch cannot be disassembled, then either replace it or make sure it is thoroughly dry inside (though the abrasive silt will eventually cause premature wear). Magnetic starters should have all rust removed from exposed metal coils. Wrapped wires should be cleaned with a soft brush so not to damage the insulation and short out windings.

A wash tub or bucket of kerosene is a great receptacle for storing small items that can't be taken care of right away. It will stop the etching and corrosion, although it's pretty hard on paint. Prudent outdoor storage is advised for this flammable liquid.

Cleaning flooded equipment is a sloppy mess, and I sympathize with your plight. In times past, I have ignored some of the points of cleaning and have had a 100% failure rate with any detail I did not attend to as I should have.

[Robert Vaughan is a contributing editor to *FWW* and a woodworking machinery rehabilitation specialist in Roanoke, Va.]

Sharpening fine-toothed handsaws

I have been told by Foley, the saw-sharpening company, that equipment that can sharpen handsaws with more than 16 teeth per inch (t.p.i.) is not available. I have a Freud 8-in., 20-t.p.i. dovetail saw. The high price of a good saw makes it a poor value if it cannot be sharpened after it becomes dull. Are all saws with more than 16 t.p.i. just a throwaway tool? Can saws be sharpened that have fine teeth and a narrow set? ***—Thomas L. Burgin, Wichita, Kan.***

Mario Rodriguez replies: Saws with 20 teeth per inch (t.p.i.) can be sharpened. They don't have to be thrown away. Craftsmen sharpened their saws routinely long before Japanese saws with disposable blades arrived.

Many small-toothed saws in the 18 t.p.i. to 22 t.p.i. range have a crosscut tooth pattern but are sharpened straight across at 90° to the sawblade (like ripsaws). The teeth are too small and close together to achieve any bevel on their cutting edges.

To sharpen your saw, you'll need a 4-in., extra-slim, tapered saw file fitted with a handle (available from Garrett Wade Co., 161 Avenue of the Americas, New York, N.Y. 10013; 800-221-2942). Clamp the blade between 2 pieces of 1x2 pine, which serve as "guides" to help you keep track of sharpened teeth and control the depth of cut. Line up the edges of your guides with the base of the teeth. Using your file, lightly pass across each tooth. Each stroke should file the front or cutting edge of a tooth and the back of the adjoining tooth. Every tooth should be brought up to a bright sharp point. When you run your hand lightly over the points, you'll experience some "grab." This indicates the job is done, and your saw is sharp.

[Mario Rodriguez is a contributing editor to *FWW* and a woodworker in Warwick, N.Y.]

Plans for Southwest-style furniture

I am looking for plans or designs for furniture that's typical of that found in the Southwestern United States. Do you know of any sources? ***—Don Hale, Roscoe, Ill.***

Sven Hanson replies: Until recently, the only plans that were available were ones you made yourself by copying designs from a book. William Wroth's *Furniture from the Hispanic Southwest* (Ancient City Press, P.O. Box 5401 Santa Fe, N.M. 87502; 505-982-8195) is illustrated with flat front and side views, making it easy to scale—especially if you use an enlarging copier to adjust drawing dimensions to neatly fit your drawing scale.

Recently, designer/author Kingsley Hammett (2405 Maclovia Lane, Santa Fe, N.M. 87501; 505-471-4549) introduced 17 sheets of Southwestern furniture plans encompassing 26 projects. The plans, which sell for $8 each (postage paid), include beds, tables, chests and cupboards; they give specific dimensions yet allow leeway for changes to suit your own needs.

All of these plans are available as a book from Red Crane Books (826 Camino de Monte Rey, Santa Fe, N.M. 87501; 800-922-3392). In the book, Hammett includes additional history, bibliography and construction notes.

[Sven Hanson is a woodworker in Albuquerque, N.M.]

Finishing to emphasize figure

I recently obtained some tiger maple with outstanding figure. I plan to use it for making a corner cabinet. I am unfamiliar with techniques used for staining and finishing this wood. How can I best bring out the figure and finish it? I would like to achieve the gold-brown coloration that I have observed in many Early American pieces. ***—Ken Drews, Phoenix, Md.***

Chris Minick replies: The key to bringing out the figure in your tiger maple cabinet is to color the wood with a dye stain. Unlike pigmented stains, which cover up the wood, dye stains accentuate the subtle highlights and figure of any wood species.

I've had good success enhancing the figure of birds-eye maple with a multi-strip dye-stain process. The overall staining process is relatively simple. But like any new technique, you should practice on scraps until you are comfortable with the results. I use water soluble dyes for staining my projects because the colors are vibrant, and they are fade resistant. Unfortunately, the water in the dye solution tends to raise the grain of the wood. For this reason, I always wet the raw wood with water during my sanding sequence to intentionally raise the fibers. After the wood has dried, I continue with my final sanding (to 220-grit on maple). Once the grain has been raised and sanded flat, it will not raise again during subsequent staining operations.

To begin the staining sequence, I first apply a dilute solution of a black, water-soluble dye to the maple. Keep the wood wet with the dye solution for about five minutes. Then wipe off the excess. Once the stained wood has thoroughly dried (usually overnight), lightly sand the entire surface with 220-grit sandpaper. Light sand-

ing removes the black stain from the surface of the maple boards but not from the figured areas. Now I apply an antique cherry water soluble dye stain to the piece. When the wood is dry, it is ready to topcoat with finish.

I usually finish my pieces with a waterborne acrylic lacquer like Carver Tripp Safe-N-Simple clear finish, but before topcoating, I seal the stained wood with two coats of shellac (2 lb. cut). The shellac seal-coat prevents the water in the finish from dissolving the water soluble dyes used to color the piece. Sealing the surface is particularly important if you plan to brush on the finish coats. Three coats of finish will usually be sufficient for long-term protection and everyday use.

[Chris Minick is a product development chemist and amateur woodworker in Stillwater, Minn.]

Short-cycling shop motors

I understand "short cycling" (i.e. repeatedly starting a motor that is already up to operating temperature) is asking for trouble because starting current, at five to six times full load current, can damage the motor. Also, large motors may be limited to one start per 30-minute period or once per hour.

I'm concerned about the 3-hp, 240v, single-phase motor on my 10-in. tablesaw. Is it permissible to turn the motor on and off at frequent intervals, such as when making repeated cuts that require measuring or resetting the fence after each cut?

—Bruce Philips, Columbia, S.C.

Edward Cowern replies: Repetitive starting of motors can be harmful, but in general, it is more damaging to large motors with high inertia loads than to smaller motors such as those that are normally used in woodworking operations.

Also, it is very unusual for a woodworking motor such as your tablesaw motor to ever get up to working temperature. The reason for this is that most woodworking operations are intermittent. There are a few seconds or minutes of heavy cutting followed by longer periods of either light running (virtually no load) or being stopped.

The repetitive starting will shorten the life somewhat, but the slight reduction would be easily offset by the convenience of reduced noise level and improved safety of not keeping it running. Overall, I would not be concerned about the repetitive starts. A good-quality motor in a woodshop will normally last longer than its owner.

[Ed Cowern is an electrical engineer in Wallingford, Conn., and president of EMS, distributors of Baldor electric motors.]

What are the best carving woods

I'm a carver who has recently relocated to the United States. I've used some cherry and basswood in England, but I wonder if there are other woods popular for working in relief?

—Jeremy Williams, Concord, Mass.

Fred Cogelow replies: With regard to suitable North American woods for relief carving, I suspect that a qualified authority might issue a list as long as your arm, however long that should be. Aside from the imported Honduras mahogany, my experience and knowledge are restricted to local species I've personally harvested. Of the timber I've cut and cured, the butternut, black walnut, basswood, cherry, red oak, red elm and poplar have been successfully used for reliefs. I've also tested white pine and seen superlative works executed in the same and some of its subspecies. Some years ago, *Fine Woodworking* featured some outstanding reliefs in alder, which also carves well.

My general observation would be that any wood that carves well should work for reliefs. The basic questions for the carver ought generally deal with priorities and parameters. Consideration must be given to the intricacy of detail demanded and whether the graininess or natural color of the wood will enhance or diminish the aesthetics of the finished piece. The larger the project, the greater the concern with the hardness, stability and the difficulty or ease with which the particular wood is joined. The questions apply not only to the species considered but to the particular stock available. Those who employ large quantities of basswood generally prefer trees from the northern states where the growth is slower and the lumber slightly denser (I found samples of English lime, which I understand to be the same tree, to be preferable for finer work by virtue of a greater density). In working the more open-grained woods, the pace of growth will have a major influence as to hardness and whether the grain contributes to the final aesthetic or merely serves to obscure the sculpted lines. As a rule, I recommend the lumber from moderately fast-grown trees from harsh climates.

A cautionary note: My own works may have served to increase the popularity of butternut at a most inopportune time. The species is under severe threat from a disease commonly known as "butternut canker." This pathology is generally indicated by a rapid decline in the crown, followed or accompanied by "suckering" from the trunk and main limbs and the eventual rupturing of the bark near the base and dissemination of black fungal spores from those fissures. State and national foresters are looking for individual trees that indicate a natural resistance to the canker, so *FWW* readers who might come across a healthy butternut in the midst of a blighted stand anywhere in its prime natural growing area (generally the upper Mississippi Valley) should notify their local forester. The hope is to graft small branches from such trees to black walnut tree roots to propagate a resistant species. A single tree could mean the difference, and don't bet that someone else will find it. Also, butternuts in decline from other causes should be harvested during the winter to increase the probability of regeneration from the roots.

While lamenting blighted species, it is only appropriate to give some mention to American chestnut, which I believe would be right up there as far as a desirable wood for reliefs, were it not also endangered.

[Fred Cogelow is a woodcarver in Willmar, Minn.]

Here we go 'round the mulberry bush

About a year ago, I acquired some small logs of an unusual greenish wood. I air-dried the logs in my shop for nearly a year. When I milled them up, to my great delight, I discovered that the heartwood is a wonderful greenish-golden color, ranging from lemon yellow (in some of the smallest logs) to olive to gold. (The sapwood, of which there is very little, is a creamy white). When planed, the texture of this wood, especially when quartersawn, is beautiful, shiny and has a depth somewhat like mahogany. It works well in all respects. I hadn't a clue as to what kind of wood it was until recently when I found out that it is mulberry. What do you know about this wood? I have never heard of it being used for woodworking before.

—D.M. Ball, Fairfield, Ia.

Jon Arno replies: Your question brings both a smile and a fond memory. Although it was many years ago, my first experience with mulberry was much like yours. A friend gave me a small, freshly cut log, and after ignoring it for a while, I decided to mill it into boards on the tablesaw just to get it out of the way. I was stunned by the beauty of the wood. Its light chartreuse heartwood

was streaked with amber ribbons and surrounded by stark white sapwood. Because the first pass through the saw bisected the log almost directly down the center, the wood's rays were exposed as narrow, broken bands running across the grain, and they were as lustrous as mother-of-pearl. Although I have opened up a good many logs since then, some of them exotic and expensive woods, none of them has surprised me in quite the same way.

However, to suggest that mulberry is a secret that only you and I share would be grossly misleading. Actually, it is a fairly popular species among bowl turners who forage and season their own turning blocks. Even though it is a ring-porous wood, mulberry turns very well. And some interesting visual effects can be achieved by orienting the turning block on the lathe to capitalize on the contrast between heartwood and sapwood in the finished bowl. With a specific gravity of 0.59, it is a tough, elastic wood, and every bit as hard to work with hand tools as white oak or sugar maple.

Technically, there are two species of mulberry native to the United States: Red mulberry, *Morus rubra,* and Texas mulberry, *Morus microphylla.* But with the exception that the Texas variety seldom grows more than 20 ft. tall, the two species are quite similar. Red mulberry is far more plentiful and can be found from southern New England, south to Florida and westward into the Great Plains. Little more would have to be said about the taxonomy of mulberry were it not for the fact that several foreign species have been introduced. White mulberry, *M. alba,* the leaves of which are the favorite food of silk worms, was introduced from the Orient during the 17th century. The silk industry never became established here, but the white mulberry is now naturalized in the mid-Atlantic and Southern states. Black mulberry, *M. nigra,* an Old World species with exceptionally large and tasty fruit, has also been widely planted throughout North America. And the paper mulberry, *Broussonetia papyrifera,* is also a popular landscape cultivar especially along the Eastern seaboard.

These immigrant species are all substantially smaller trees with little potential as a source of lumber. But red mulberry can reach 70 ft. in height and up to about 3 ft. in diameter. Knowing this, and knowing how attractive the wood is, begs the question: Why hasn't at least red mulberry become an important commercial timber? I suspect the reason is two-fold. First, this species seldom survives to maturity in that it is not shade tolerant when crowded by other forest trees. Even in urban locations where it does seem to thrive, such as along fence rows, it tends to get cut out when it gets large enough to damage the fence or drop its messy fruit all over the yard. And second, in all my travels, I've never seen a mulberry tree with a straight trunk. With such a crooked growth habit, wide, long boards of this species are rare indeed. As stunningly attractive a wood as mulberry is, it seems destined to remain the exclusive reward of those woodworkers who are willing to go out and forage for it.

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

Dust-collection details

I just read with extreme interest your articles on a cyclone separator and tube filters as a means to improve shop dust collection (see Fine Woodworking ***#100, pp. 76-81). I am in the process of setting up a new shop, and I was about to buy a regular dust collector. I had thought a 2-horsepower unit for my home shop would probably be fine. Now, after reading your articles and because my nose tends to rule my life, I am sold on the idea of cyclonic precipitators.***

However, I have a few questions that were not addressed in the articles. What is the path of the air flow through the system, and what is the bottom line on putting one of these systems together? Does the approximate cost of the system described by Neil Seely include about $100 for plywood, $200 for the fabrication of a cyclonic precipitator and the cost of an off-the-shelf dust collector, which is then cannibalized for its blower motor? Would it be cheaper to buy a blower and motor separately? Finally, I would like to know about the dangers of explosion that might exist due to cellulose and dust collection.

—Gary Gilbert, Somerville, Mass.

Peter Fedrigon replies: The first step in setting up a dust-collection system for your new shop is to determine the amount of air required by each machine to take care of the wood dust generated. In your small woodshop, it is most likely that you will be running only one machine at a time. Therefore, you should determine the size of your dust-collection system according to the air requirements of your largest machine. This is usually the planer, which can require up to a 900-cubic-feet-per-minute (CFM) blower capacity. In your situation, the 2-hp/1,000 CFM system would probably be best.

For a 2-hp unit, with air usage between 800 and 1,200 CFM, the pipe should be sized to maintain a conveying velocity between 3,500 to 4,500 feet per minute.

The dust/air mixture travels through the system in the following manner: It is first collected at the machine and then conveyed to the cyclone where all but the finest particles are separated from the air. The fine dust/air mix then moves through the fan and on to the filter bags.

The heart of the dust system will run (all costs are approximate) $200 for a cyclone, $350 for a 2-hp dust collector (includes motor and blower) and about $150 for a set of tube filters. Finally, there's the cost of the duct work, collection hoods and plywood you'll need to put the new, improved system together.

The complete system does not have to be set up all in one place. The cyclone and fan could be put outside the shop and the bag filters inside. This would move the noise of the system outside yet return heated or cooled air to the shop. However, adding the cyclone and extra filters will reduce the noise level of the system.

Explosions are unlikely in either the cyclone or the tube filters if these components are sized appropriately for the system. Separation of dust and air in a cyclone occurs rapidly, and the air-to-dust ratio is not high enough to allow for an explosion or fire. Because of the high pre-separation in the cyclone, little dust gets to the tubes filters, and even if there were enough dust, the filters cannot contain an explosion. Static sparks are generally not a factor because the blower motor is statically grounded. The cyclone would also be grounded if it's connected to the blower by metal ducting. Any plastic ducting should be grounded by running a bare copper wire inside the duct.

Blowers with aluminum fan wheels are recommended for woodshops because aluminum is a non-ferrous material, which cannot transmit sparks. Nevertheless, a fire could occur if the wood-dust material is not removed and a high concentration of dust builds up in the bags. Then a static spark from improperly grounded plastic pipe or some other source could ignite the dust.

[Peter Fedrigon is a consulting engineer for industrial air filtration systems and owner of Oneida Air Systems in Cleveland, N.Y.]

Send queries, comments, and sources of supply to Q&A, Fine Woodworking, *PO Box 5506, Newtown, Conn. 06470-5506. We attempt to answer all questions, but due to the great number of requests received, the process can take several months.*

Dining Table Has Tilt Top

Legs with sliding dovetails support pedestal for strength and maximum legroom

by Nigel Martin

***Practical and versatile,** this pedestal table, shown here in cherry with ebony stringing, can be made with a round or oval top, and the simple design will play as well in the den as the dining room.*

The straightforward, uncluttered design of this dining table lets it fit as comfortably in a kitchen as in a formal dining room, and with its tilting top, it can be stowed against a wall in a room with multiple uses. Over the years, I've made it in cherry, as shown in the photo above, as well as chestnut, ash, elm and oak, with different finishes and detailing depending on the setting and the customer.

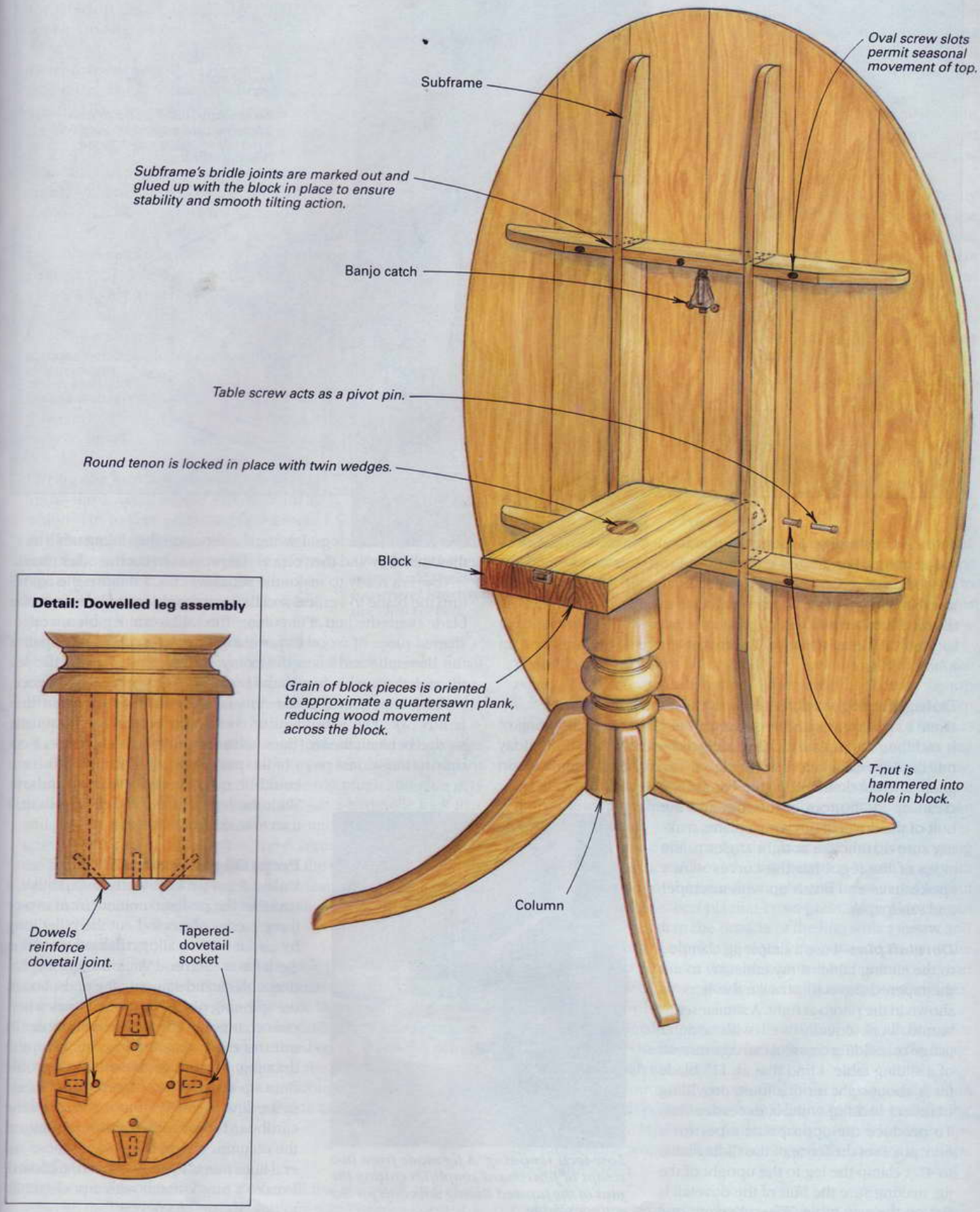
I think round and oval tables provide the most sociable seating arrangement, but they concentrate more knees in less space. That's why a pedestal base, with its yards of extra legroom, is such a good match for a rounded-top table. For reasons of balance and stress, a central pedestal base won't pair as well with large rectangular tops whose corners can become powerful levers. Even with a rounded top, the leg joints in a pedestal are subjected to enormous stresses. To resist those stresses, I join the legs and column of this table with tapered sliding dovetails, a very strong, self-locking joint, which I reinforce with toenailed dowels, as shown in figure 1 on the facing page.

Start with a drawing

I begin each table by making a full-scale, cross-section drawing on a sheet of ⅛-in. Masonite painted white to show up my lines. I draw the column, one leg, the block and a section of the top. As I build, I make notes on the Masonite and end up with all my information in one place, making for easy referral and reuse. I let the bottom edge of the Masonite be my floor line and draw in the top of the table 29 in. above that. I work downward from there, sketching in the block and the contours of the column. When I've established the bottom line of the column, I can determine the splay of the legs. For maximum stability, the tips of the legs should extend

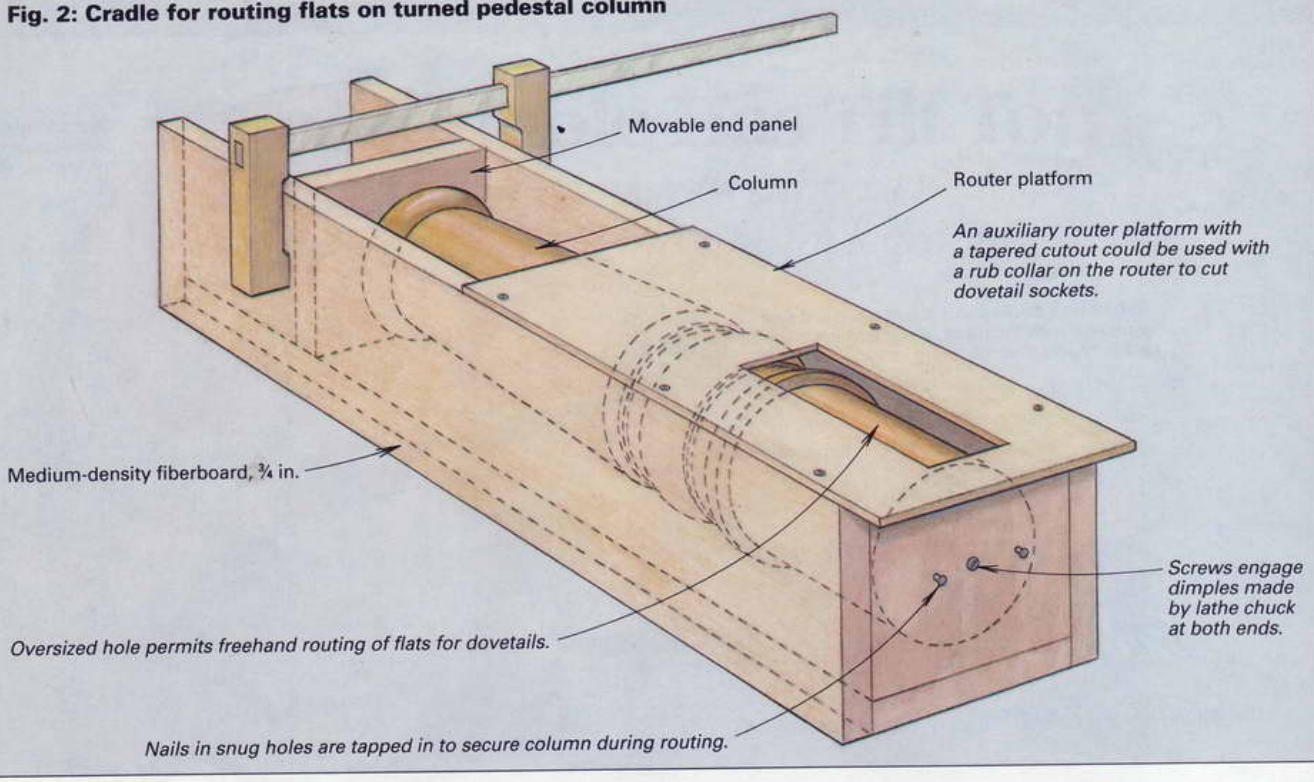
Photo this page: Tony Freeman-Cosh

Fig. 1: Making a tilt-top pedestal table



Drawings: Lee Hov

Fig. 2: Cradle for routing flats on turned pedestal column



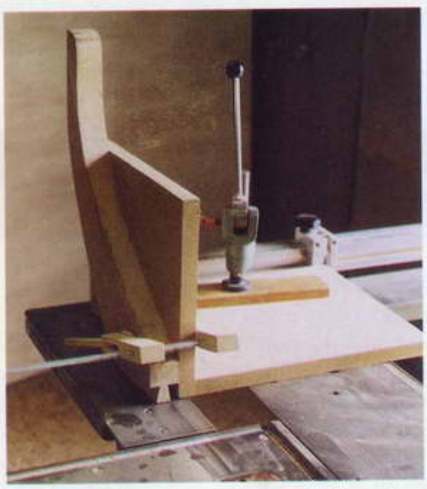
out as far as possible. I locate the tips about 2 in. inside the rim of the tabletop. For a table with a round top, this can be accomplished on the cross-section drawing, but for an oval-topped table like this one, I draw a top view to locate the tips and then transfer the measurement of the leg span to the cross section. When I have located the tip of the foot, I draw the curve of the leg back up to the column.

Doing the legwork

Once I am happy with the shape of the leg, I make a tracing of it and then a template, adding an inch for the dovetail pin. I lay out the legs on planed stock, being careful to minimize short grain, and cut them out on the bandsaw. I clean up the bottom of the foot and the butt of the dovetail pin with a plane, making sure that they're at right angles to the sides of the leg. I fair the curves with a spokeshave and finish up with a scraper and sandpaper.

Dovetail pins—I use a simple jig clamped to the sliding table of my tablesaw to cut the tapered dovetail pins on the legs, as shown in the photo at right. A similar setup would work equally well with a miter gauge or a sliding crosscut carriage instead of a sliding table. I find that an 11° blade tilt is about right for this joint, providing excellent locking without excessive flair. To produce the appropriate taper for a 6-in. pin, I set the fence of the sliding table to 4°. I clamp the leg to the upright of the jig, making sure the butt of the dovetail is flat on the saw table. When I've cut one cheek on all four legs, I swing the fence on the sliding table to 4° the other way and then repeat the process to cut the other cheek.

Now I'm ready to make the shoulder cuts. I remove the jig, return the blade to vertical and then set the rip fence ⅞ in. from the blade (with the kerf, I'm cutting 1 in.). I lay the leg on a wedge-shaped piece of wood (whose angle corresponds to the taper of the dovetail) and clamp it to my sliding table. I push the leg through the sawblade with the butt of the pin against the rip fence, making a perfect tapered dovetail, which requires no further handwork. The shoulder cut could also be made without the wedge beneath the leg; the sawblade would be set lower so it cut only to the widest point of the pin's neck and then the finish cut could be quickly made with a handsaw. With the legs shaped and the pins cut, I turn to making the column.



Low-tech tenoning. *A jig made from two scraps of fiberboard simplifies cutting the pins of the tapered sliding dovetails for the author's table.*

Preparing the pedestal

Unless I have a suitable 6-in.-sq. billet, I laminate the pedestal column from two or three pieces of stock. I cut the billet long by about 1 in. to allow for truing cuts on the lathe at each end. After turning a cylindrical blank and squaring the ends, I mark the spinning piece with pencil lines wherever changes in the profile will occur. To transfer these transition points from the drawing, I first trace the column's profile onto a piece of white poster board. Then I strike square lines out to the edge of the cardboard from each transition point on the column. Where each one of these lateral lines meets the edge of the cardboard, I make a tiny V-notch with a pocketknife to hold the tip of a pencil.

Photos except where noted: Nigel Martin

My bead and cove designs vary, but I always turn a 2-in. round tenon at the top of the column to join the block that supports the tabletop and a 6-in. cylinder at the bottom for the leg joints.

Dovetail sockets—The first step in cutting the dovetail sockets, or housings, is creating flat areas where each leg will join the column. You could cope the shoulders of the pins to match the radius of the column, but that's more difficult and, in most cases, will actually reduce the strength of the joint. I cut the flats with a router riding on an adjustable cradle jig that holds the column, as shown in figure 2 on the facing page. Once I have cut the flats, I mark out the sockets from the pins (numbering mating pins and sockets). After a cup of coffee, it's time to remove the waste from the dovetail sockets. I use my hollow chisel mortiser and the setup shown in the photo at right. You could also use a bit in a drill press or even a hand-held drill to remove most of the waste and finish up by hand.

Fitting the joints—Here's the moment of truth—the dovetail should slide right up to within ¼ in. to ½ in. of the end of the socket. If the top of the leg is within ¼ in. of the end of the socket, you are probably safe to tap it gently home. When the joint is home, there should be no gaps between the shoulder and the flat on the column. If the leg is much more than ¼ in. from the end of the socket, remove it, and rub a soft leaded pencil on all surfaces of the pin. Then reinsert it, and remove it once more. Pencil marks will be transferred to the socket, so you can identify the high spots and pare them away with a chisel.

Once the fit of each leg is satisfactory, I smear a little yellow glue on all surfaces of the socket and tap the pin home. It is important not to overdo it with the glue: If you use too much and glue gets carried toward the shoulder, you could get a hydraulic lock that will prevent the leg from being driven home or even split the column. Once the legs are glued in, the column can be set down on the floor. No clamps are needed. When the glue dries, I reinforce the joint with dowels driven at 45° from near the center of the bottom of the column out into the butts of the dovetail pins.

Block building

I glue up the block from 2-in.- or 3-in.-wide pieces with their grain oriented so that together they approximate a quartersawn plank (as shown in figure 1 on p. 53). The hole to mate with the round tenon on the top of the column can be drilled with an expansive-type bit in a drill press, or it can be turned outboard on the lathe. I round over the top edge at one end of the block to provide the clearance the tabletop needs to move through 90°. At this point, I fit the block on the pedestal without glue and set it aside. Then I turn to the table's subframe.

Subframe fit is key

For the stability of the table, it's essential that the block fit snugly between the two long rails of the subframe. To ensure a good fit, I do both the marking out and gluing up of the subframe's bridle joints with the block secured in position. I use table screws at one end of the block, where they function as pivot pins, and a single banjo catch at the other end, as shown in figure 1 on p. 53. If the table is to have a fixed top, I replace the banjo catch with a second pair of table screws. Hardware for both fixed and tilt-top pedestal tables is available from Garrett Wade, 161 Avenue of the Americas, New York, N.Y., 10013; (800) 221-2942.

After gluing up the subframe, I do any necessary trimming on the edges of the block until it moves smoothly within the frame, and I glue the block to the pedestal. It's critical to orient the block accurately on the column because this will determine the relationship between top and feet. To make the match, I take the just-glued (but with no tenon wedges) pedestal and block assembly and lay it on its side on the tablesaw. When the tips of two feet as well as the whole length of one edge of the block are on the table, the two parts are in alignment. Then I drive wedges into precut slots in the pedestal's round tenon.

Chopping the leg sockets—*Three tapered shims hold the column in register as a hollow-chisel mortiser cuts the cheeks of the dovetail sockets.*

Top it off

The top is the final component to be made. I glue it up in one hit, placing the clamps alternately above and below the top to even out clamping forces. I use urea formaldehyde glue here instead of yellow glue, which has a tendency to creep slightly and form tiny bumps along the joint lines. A few biscuits in the edges of the boards keep them in alignment. I handplane the top flat, first using a jack plane across the grain and then a really sharp smoothing plane with the grain. I try to achieve as good a finish as possible with a smoothing plane and then go straight from that to 220-grit or 320-grit sandpaper. If the wood has been kind to me, I don't sand at all. Somehow the surface of wood seems to have more clarity and character when it has been planed than when it has been sanded.

I do all the planing and any but the finest sanding before cutting out the top. It's easier to hold the top between bench dogs with the edges and ends of the boards straight, and I also avoid tearout of the finished edge when planing cross-grain. After plotting out the oval or circle, I cut to the outside of the line with a jigsaw and refine the edge with a block plane. Marking out and fairing up the curves of the top could be done just as well with a template and router, but because I have already filled my garage with templates, I prefer to do it by hand.

With the top finished, I screw the subframe to it, allowing for movement across the top's width by slotting the holes in the frame members that span it.

The finishes you could put on this table are as varied as its uses, from French polish in the formal living room to penetrating oil in the kitchen. My favorite finish is oil because it is easy to apply, protects the wood well and, over a period of time, it develops a beautiful sheen. □

Nigel Martin is a professional cabinetmaker in Norfolk, England.

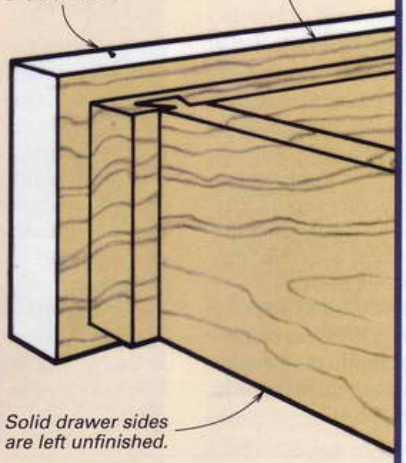
Paint-Grade Cabinets

Preparing wood for a demanding finish

by Lars Mikkelsen

Picking paint as a furniture finish is not just a matter of shuffling color swatches. *As Lars Mikkelsen discovered when he bu these cabinets, painted work requires design decisions, materials and preparation different from clear-finished work.*

Most of us who work in wood love its color, grain and texture, and we usually build to show off these characteristics. So when a client called and asked me to make a built-in stereo and display cabinet that had to be painted high-gloss white, as shown in the photo at left, I hesitated a little. But when I saw his house and the room the cabinet was to go in, it was obvious to me that paint was what this job called for. It is a modern house, sparsely furnished, with light-filled rooms defined by strong geometric forms. It was an excellent setting for a built-in cabinet that blends architectural and furniture detailing, and a good place for paint. Once I had accepted the logic of a paint finish, and also had accepted the job, every subsequent move I made was affected by the choice of finish—from decorative and structural decisions through selection of the materials to construction and sanding.



Back of drawer fronts rabbeted to provide uninterrupted edge for transition from paint to raw wood.

Planning for paint

There are all grades of paint finishes, and it's important to have a clear idea of what you are aiming for before you begin. I talked with the client at length about the level to which the painting should be done. We wanted something well above the average wall-and-trim job, but taking it to the level of a grand piano would have made the cost of the prep work and the painting prohibitive. So we agreed to try for something in between: A bit of grain texture might show under careful inspection, but the overall impression should be clean and unblemished. With an understanding of what we both expected, I was ready to begin.

When designing for a clear finish, the color and grain of the wood are often the central point. A big, flat panel can be spectacular if the grain is right, and curved grain along a focal axis can pull a piece together and make an otherwise very plain design a thing of beauty. All this is lost when you paint. What you gain in return is beautiful clean shadow lines, undisturbed by grain pattern and texture. Paint emphasizes the volume of intersecting planes, and I took advantage of this in the design of the cabinet. The piece was to be built into an alcove formed by a series of sharp-edged, squared-off arches that stepped out into the room. I adapted this step pattern for the cabinet's detailing, echoing and altering the step motif, playing off it without exactly reproducing it. I would have designed differently for a clear finish because the distinctive geometric patterns and proportions I settled on would have seemed cluttered and confused had they not been painted.

I try to design built-in furniture that looks truly built-in, like the beautiful buffets so often found in Victorian houses. Thinking of trim as an important design element contributes greatly to the integrated look that I always seek. It's easy, when designing built-in cabinets, especially painted ones, to fall into the trap of making misplaced kitchen cabinets. I try my best to avoid this by developing detailing that will give the piece a look of permanence, of belonging where it stands.

Because the piece was to be fairly big, I broke it down into four components that could be easily transported and assembled on site. I used a raised frame detail all around and between the major components. I applied these trim strips when the cabinets were set in place. This not only covered seams and edges but underscored the visual theme of the cabinet.

To take advantage of the strong shadow lines, I made all the doors and drawers inset—flush with the surrounding surface—and free of exterior hardware. With inset doors and drawers, an even gap is always important, but when a black gap line is contrasted with white paint, small discrepancies become obvious to even the untrained eye. And I was making the tolerances small, so I needed hardware with fine adjustment. I wanted concealed European hinges for the doors and chose Grass 1006 hinges on 20mm mounting plates. I picked the 1006 because it's relatively small; I was advised, though, that it won't work with inset doors that are any thicker than ¾ in. The doors are held closed and sprung open with Hafele touch-latches. For the drawers, I used Accuride full-extension slides and 1041 Flexa-Touch pushers. I purchased my hardware from Capitol Hardware, 1519 Riverside Ave., Paso Robles, Calif., 93446; (805) 238-7669.

I wanted the doors painted on both sides, but for the drawers, I wanted only the fronts painted, leaving the solid-maple drawer boxes unfinished. This posed the problem of where to make the transition from painted surface to raw wood. I solved it by running a rabbet around the inside edge of the drawer front, establishing a clean, uninterrupted line for the painter to tape off, as shown in the drawing above.

Materials to fit the finish

The materials I chose for this job were determined largely by their paintability. I needed something without open pores or great differences between hard and soft grain because such differences would telegraph through paint. I ended up choosing poplar for the solid wood and shop birch plywood. Both are relatively inexpensive, mill well and require minimal preparation for painting. Other choices for solid wood could be maple, birch or alder. The main reason I chose poplar over the others was the ease with which it can be milled. For sheet goods, medium-density fiberboard is a possible choice; it paints nicely, but is extremely heavy to haul around and, therefore, easy to damage.

Stereo speakers were to be housed behind the top doors on ei-

How to pick your painter

To prequalify a painter for a difficult finishing job, I would recommend asking to see what he considers his finest work. I'd also ask him to explain in detail just how the finish will be achieved. I'd have him prefinish one door panel using the materials and finish specified for the job. The client would approve that sample for color, gloss, smoothness of finish and durability, and then it would be used as a job standard. I have often volunteered to do this when the situation warranted it, or when the client was unfamiliar with my work. □

Dave Hughes is a professional finisher in Los Osos, Calif. For a description of how he painted Lars Mikkelsen's cabinet, see p. 64.

Photos: Sandor Nagyszalanczy; drawings: Rob Mihaley

Spraying an opaque finish on furniture

by Dave Hughes

Ask any painter familiar with high-quality finishes and he or she will tell you that furniture-grade paint finishes are far more demanding than natural wood finishes. The simple reason is that the opaque surface of the paint highlights any defects or irregularities in grain and texture. Surfaces must be sanded, caulked, puttied and re-sanded several times, and still some rubbing out and polishing may be required to achieve satisfactory results. The deeper the color and higher the gloss, the more demanding the process. With so many variables to be controlled, a patient, methodical approach is essential in applying opaque finishes.

Now, try to achieve that flawless finish inside a client's home, with kids, dogs and neighbors dropping by for a look...to be candid, I didn't have too much enthusiasm for attempting the on-site finishing of Lars Mikkelsen's cabinets until I saw them for myself. They posed a real challenge, both technically and logistically, and that is what got me involved.

On any on-site job, you have to take particular care to cover and to mask off all adjacent surfaces and any parts and hardware that won't be painted. The tape I use is 3M's Longmask, a fine-creped blue tape with high tack that leaves no residue. I rub it down with a fingernail, and it provides an excellent edge seal, allowing no paint to creep underneath. With oil-based finishes, the tape can be pulled up when the paint is dry. With latex, which has greater bridging capacity, I score a line along a straight edge with a razor blade before removing the tape.

Good lighting is also critical for a top-quality paint job. Natural light is always best, but when I do use lamps, I place them far from the work to minimize glare.

The cabinets on Lars' job were already sanded quite smooth when I began work on them, but I always count on a certain added amount of time for re-sanding, puttying and caulking because you can't really see the surface in detail until that first coat goes on. I have found it is best to fill all you can easily see; then apply a first coat of primer, and repair any small areas you have missed. The essential thing is to catch all of these before entering into the final-coats phase. This careful, methodical filling and sanding is where the patience factor really tells. For a fine finish, you must spend a certain amount of time just *looking* at every piece.

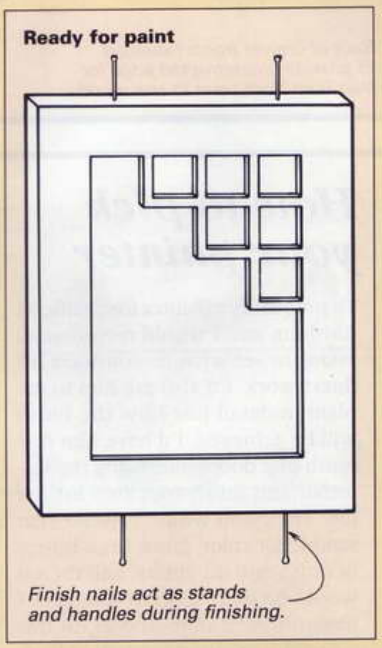
Lars had removed the doors, and I fitted each one with two small finish nails in the top and bottom edges (as shown in the drawing above) to act as stands for spraying, handling and drying. Then I set up a makeshift booth in the garage to spray the doors and drawers.

The primer I sprayed was Sherwin-Williams Hi-Build Lacquer Wood Surfacer reduced about 35% with medium-fast lacquer thinner. I used a high volume, low pressure (HVLP) spray unit, which, with its portability and reduced overspray, is particularly well-suited to on-site work. I used the HVLP unit with a Capspray fine-finishing gun.

After spraying two coats of lacquer wood surfacer, I lightly sanded all surfaces with 400-grit wet-or-dry sandpaper that I first broke in on the backs of doors or bottoms of cabinets where dry-fall overspray accumulates. I turn the paper over and use the paper backing to abrade the knife-edges of doors, drawers and trim to avoid burning through the finish.

The third coat of primer was a final fill-coat, not really sanded, but rubbed with the back of sandpaper for smoothness. Before every operation, I used a static-free tack-rag and blew the surfaces off with the air line on the spray gun. I allowed four hours between coats of primer because that's how long it took to spray a coat on the case and all the parts. But a lacquer undercoat is generally dry and ready to sand in 45 minutes to an hour, depending on the weather.

I applied two finish coats of Benjamin Moore Ironclad fast-dry industrial enamel, which has superior leveling-out characteristics and fast set-up time. The short tack time is critical when finishing on-site to minimize dust settling onto the finish. I thinned the enamel with about 30% xylol solvent and sprayed it at orifice settings between .006 and .009, something less than half the opening you would use to paint an ordinary wall.



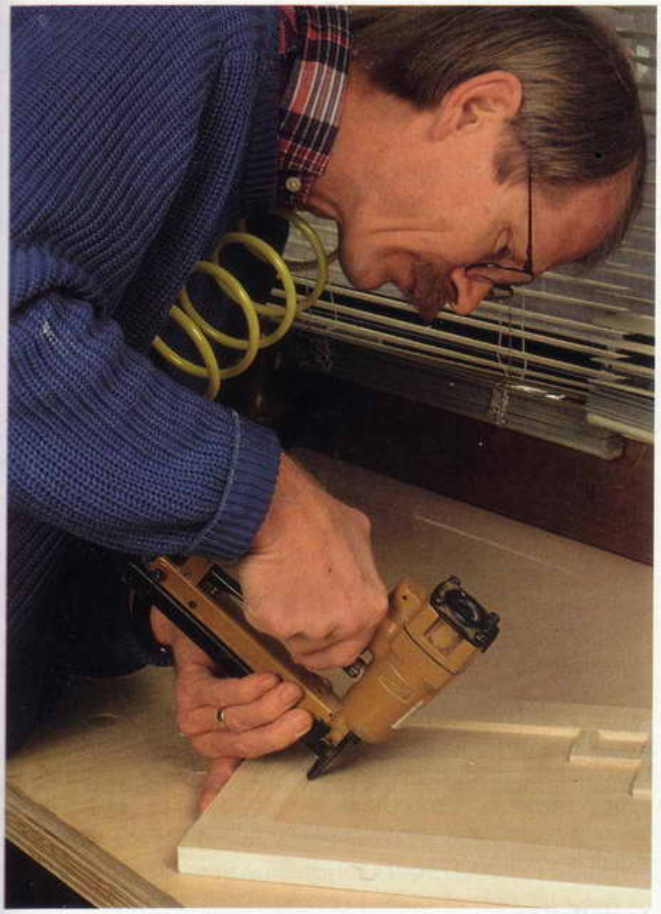
Finish nails act as stands and handles during finishing.

I alternated between vertical, horizontal and conical spray patterns as I worked to suit the intricate detailing on the cabinet doors, with the spray pressure just high enough to atomize the enamel. The Capspray gun enables me to spray in a cone pattern about the diameter of a pencil—it's practically an airbrush at that setting—which worked beautifully in the square decorative recesses of this cabinet. For the doors and frames, I switched to a 6-in. to 8-in. horizontal fan pattern.

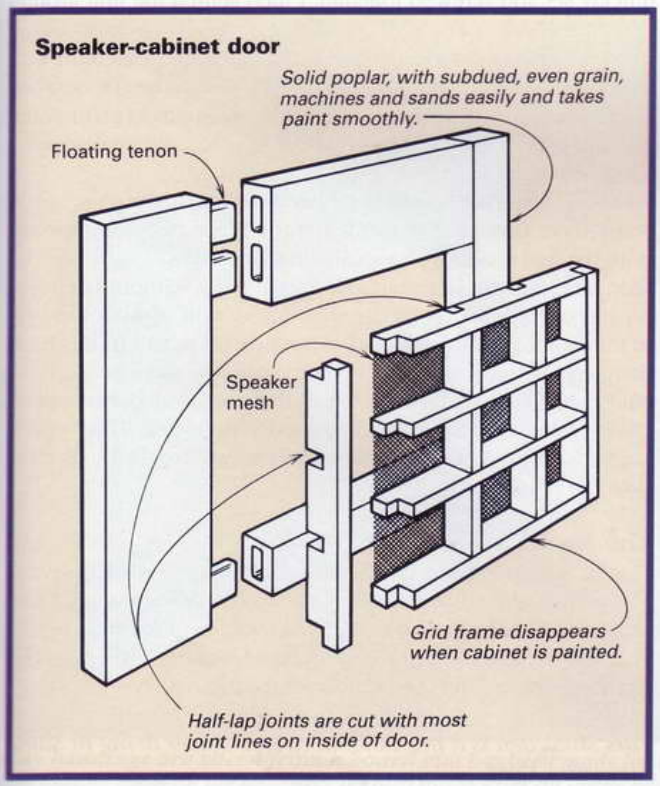
A single coat was actually a two-step process. On the doors, for instance, I laid down a light tack-coat initially to cover the surface, rotated and tack-coated the back, and then flipped and rotated back for a full flowing coat. This method allows me to see how the material is performing and adjust viscosity, spray pattern, pressure and fluid levels before committing to a full coat. It also lets me lay down more material in one coat. I sanded lightly between coats of enamel with broken-in 600-grit paper, wiped down with a tack rag and allowed 24 hours between coats. I applied a third coat to all the doors and countertops.

When the final coat on the doors had dried hard, I removed the nail stands, puttied the holes and touched them up with two coats applied with an artist's brush. This was the only brushwork on the job.

After spraying the final coat, I took a few days away from the job before returning to do a final inspection and any necessary buffing out or touching up. The hiatus gave me some perspective and also let the finish cure hard and reach its final sheen. If you do any small repairs before the final sheen is reached, you may find they stand out later, looking either too glossy or too dull. I repair tiny blemishes by rubbing out with rottenstone or #00000 steel wool or buffing with alcohol and a tightly woven cotton cloth. A slow, hard rub with a coarser abrasive will give a matte finish while a fast, light stroke with a finer grit will yield a glossy one. By carefully adjusting the amount of pressure and the type of polishing compound, feathering out any touch-up areas and matching the sheen to the surrounding surface, you can approach a showroom finish with an on-site application. —*D.H.*



***Nail in the rail**—The author shoots brads through the frame of the door to keep it from shrinking away from the panel, which could crack the paint and expose unfinished wood.*



ther side and the center door below. I made open-grid panels for those doors and covered them on the inside with sheets of metal speaker mesh (available from better stereo outlets). The mesh was painted to the same color as the cabinet and was easy to cut and install with small screws.

Joint selection

Both the finish and the siting of the cabinet were factors in my selection of biscuits for its major joinery. Using biscuits alone on a freestanding piece that could take a lot of abuse over the years might not be a good idea; but once a built-in is in place and attached to the walls, there is not much stress on the joints. So I felt this technique would be amply strong. Because the sides of the cabinet would be hidden when it was put in place, I used screws to draw the joints together while the glue set. I lipped all the plywood with ¾-in. by 1⅛-in. strips of solid poplar that I biscuited, glued and nailed on. It saves a lot of time to nail the wood on rather than clamping it, and the spackled nail holes disappear under the paint. I also find that with nailing, I can locate the lipping exactly, but with clamps, the strips are a bit more difficult to control.

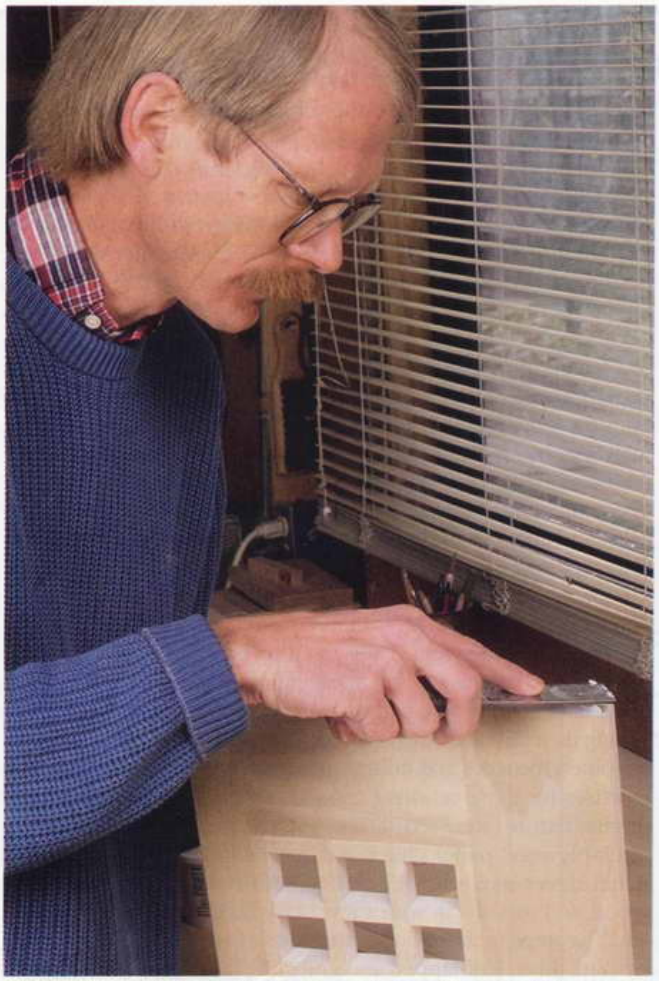
Though the carcase of a built-in does not take much abuse and you can use some shortcuts in its construction, this is not true for the doors and drawers. They need to be made with the same strength and care as for any freestanding piece. I made the drawer sides of solid wood, and then I joined them to the fronts with sliding dovetails.

I joined the stiles and rails of the doors with loose tenons. The mortises for these tenons I can cut with great precision on my mortise fixture (see *FWW* #92, p. 55). The solid doors have a ¼-in. birch-plywood panel sitting in a groove. It is important that this panel never move in the groove, and thus expose unpainted wood, so I nailed it in with a few brads, as shown in the photo at left. The steps in these doors are strips of solid poplar ½ in. wide by ¼ in. thick, half-lapped and glued in place. The open grids for the speaker cabinets are made with ½-in.-wide by ¾-in.-thick pieces of solid poplar, half-lapped at every joint, as shown in the drawing below. Had these doors been left clear, I probably would have mortised the end of each crosspiece of the grid into the stiles and rails. But because no grain would show, I made the grid as an independent unit with a frame of its own, with all half laps, and then glued up the stiles and rails around it.

Paint prep

It would be hard to find someone who really loves filling and sanding, but the job can be made easier and less tedious by doing as much as possible as you build. For many parts, it's much simpler and quicker to do the prep work before assembly. I carefully filled and sanded the plywood panels in the solid doors before glue-up. On all the pieces of lipped plywood for the carcase, I sanded the wood flush to the plywood with a belt sander that I slowed down with an electronic speed control. The slow speed makes this operation much easier and safer. Next I inspected all the pieces carefully and then filled and sanded any little cracks or dings that might show up later. Remember that paint really magnifies these blemishes.

When the carcases were assembled, I applied white latex caulk to all the many corners whether I could see a seam or not. I used spackle for any joint or surface that would be sanded. All this filling must be done carefully because even a hairline crack will show horribly once the paint is on. To achieve clear, crisp lines and joints, it is important to press caulk into the cracks but immediately remove all excess, leaving interior corners square rather than forming a little cove of caulk. To do this, I laid down as small



Even with end grain, it's best to scrape off most of the spackle. *If necessary, apply a second time rather than build up a thick layer. Do a last round of filling when the piece has been primed. The layer of finish will highlight any imperfections.*

Fill every corner, whether you can see a seam or not. *For long runs, caulk is best, but in tight quarters, like the door panel grids, the author uses spackle because it's less messy. With a freshly filed putty knife, he removes 95% of the filler he lays down.*

a bead of caulk as possible. Then I used a putty knife that I had filed down so that it came to a knife edge and its corners were sharp and square. I probably removed 95% or more of the caulk that I applied. I don't worry about small smears of caulk or glue, but all protrusions should be removed.

After gluing up the doors, I caulked all around the groove and panel joint, cleaning it up with my putty knife. I filled the seams between the grid pieces with spackle, as shown in the bottom photo. When there's a long run to fill, it's easier to lay down a bead of caulk, but in tight spaces like the grids, caulk will make a mess. It is important to work methodically at this, so as not to miss any of the little seams. Then I took all the doors to be thickness-sanded. Some cabinet shops offer this service, and it is very worthwhile. It saves time while doing a superior job, keeping everything wonderfully flat, resulting in a beautiful, clean reflection of light when painted.

At this point, all parts had been made, filled and sanded, and all I needed to do in the shop was to fit the doors and drawers in their openings. Before fitting anything, I assembled the four individual carcases, screwing them together and shimming them as needed to get everything straight, flat and square. I glued my shims in place so that they would stay on one of the carcases. That way, when I later assembled the carcases on site, I was sure to get them exactly the way they were when I fitted the doors and drawers, saving a lot of frustration and awkward planing. I then sanded everything down to 180-grit with my random-orbit sander and broke all sharp edges by hand-sanding, creating a small roundover. A roundover always looks nice, but when painting, it is absolutely essential because paint will not adhere to sharp edges and a dark line will appear.

Installation

Now the moment of truth. No matter how many times I have done installation, it is still stressful until everything is in place. This time everything went smoothly, and the major components were quickly set and screwed together. I then shifted the unit around a bit in the wall opening to get all side margins as even as possible. I removed all doors, drawers and hardware, numbering all the hinges so that I could put them back where they came from. This makes re-installation much faster because almost no fine-tuning is needed. I left the drawer guides in place and then covered them with tape.

Though this is the point when I hand a job off to the painter, I always make certain to return when the piece has been primed. With the first coat on, previously unnoticed flaws can readily be seen, and it is the last chance to repair them without having to repaint everything. (For a detailed description of what went into the painting of this piece, see the box on p. 64.) In this case, there was nothing for me to do at the priming stage because the painter had already done any filling that was needed. I always insist on rehanging the doors and hardware myself: This is not a painter's job, and he or she cannot be expected to do it so that the doors fit properly.

The payoff

Finally, everything was done, and I could see the piece the way I had imagined it while doing the design. I was hoping my client would be as happy as I was. I got a clue when I returned for my check and found the furniture rearranged. Before, it had been facing the fireplace, and now it all faced the cabinet. □

Lars Mikkelsen is a professional cabinetmaker living in Santa Margarita, Calif.