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WOODWORKER'S JOURNAL

April 2001
Volume 25
Number 2



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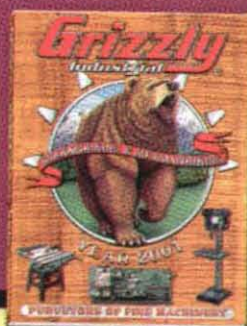


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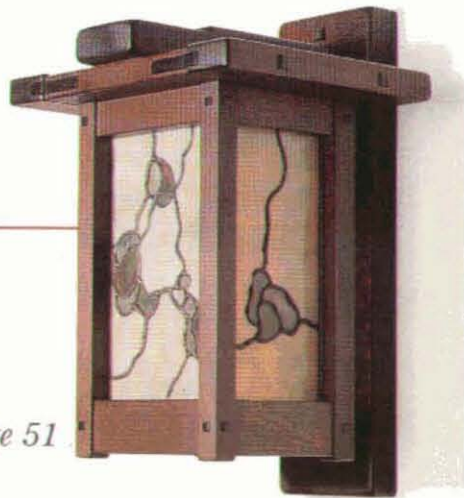


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Woodworker's Journal Features

March/April 2001

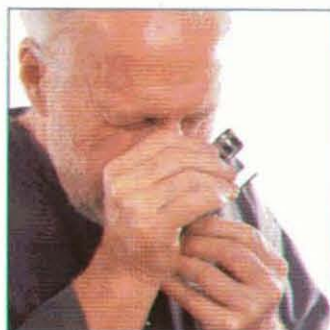
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30 Sharpening with Diamond Paste

By Ian Kirby

Something new in the sharpening world? Woodworking guru Ian Kirby checks out diamond paste in this discussion of sharpening basics for planes and chisels.

36 WWII Display Cabinet

By John Kelliher

Our art director takes a turn in the shop to produce a display case for a special WWII veteran — his dad.

42 China Cabinet

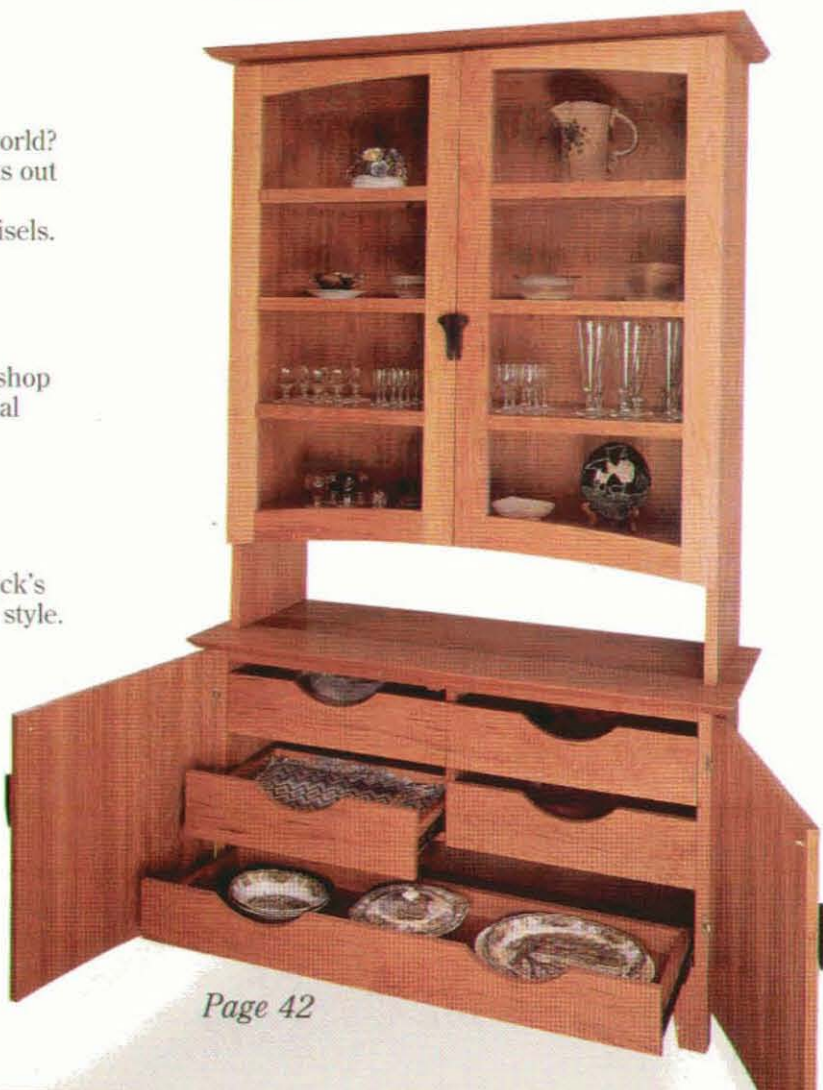
By Rick White

The clean lines and fine details of Rick's cabinet blend well with virtually any style.

51 Arts & Crafts Style Lamp

By Michael McGlynn

An updated version of a classic style, this lamp incorporates the Greene brothers' mahogany framework and ebony accents.

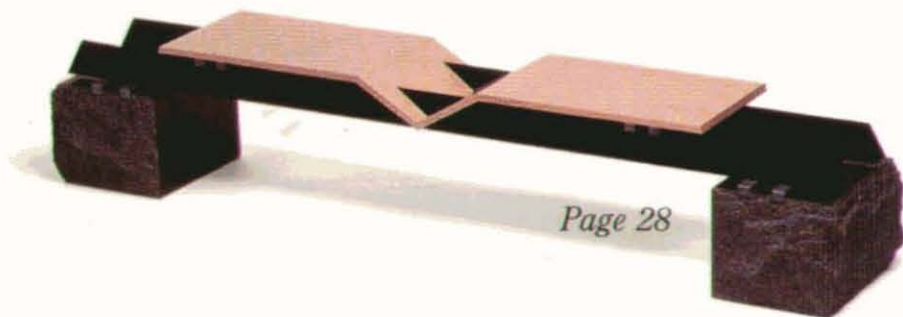


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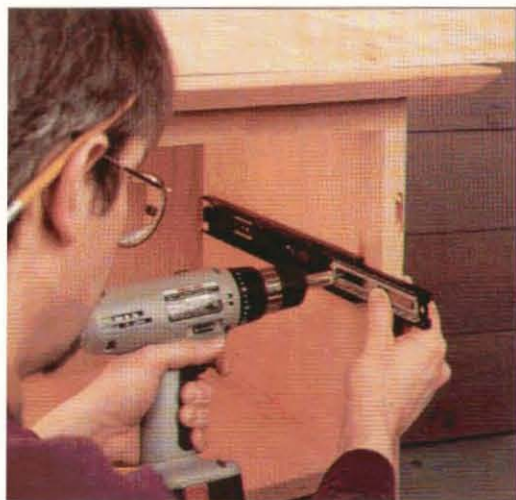
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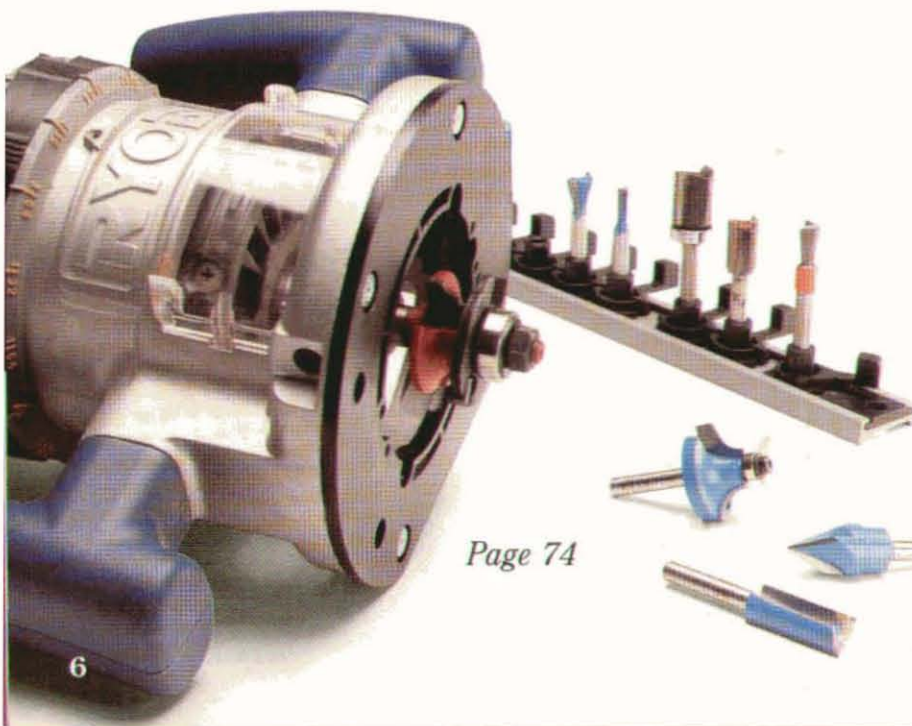
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All about router bits.

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New tools for your shop.



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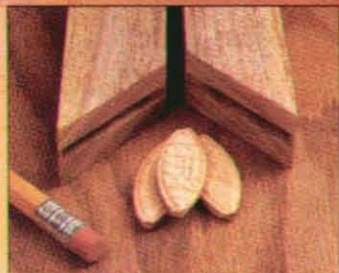
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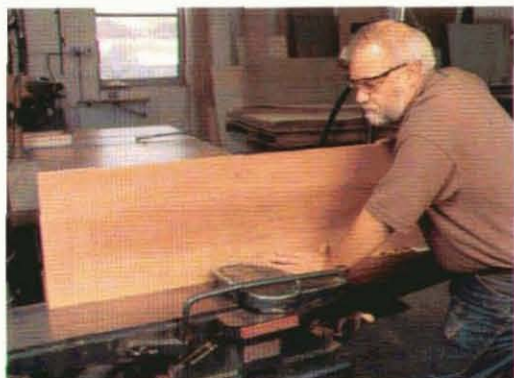
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Changes, After All These Years

I'm always glad to hear that readers (225,000 of you, at last count) like what we're doing with your favorite magazine. My sincere thanks for all the comments about the changes we made in the last couple of issues! Inside this magazine? More changes to our 25-year-old publication.

That's right; as I reminded you last time, the year 2001 begins the second quarter century for our magazine. To my way of thinking, our silver anniversary is the perfect time to do a little revamping and reinventing: We're keeping the best of the old, but adding fresh, new topics as our magazine grows up. (Just think of it as a 25-year-old moving out of dad's garage — making room for some cool new tools.)



Our master furniture maker, Rick White, considers the jointer one of the most valuable tools in his shop. Here he's shown preparing stock for the China Cabinet in this issue. Look for Charlie Self's review of jointers on page 56.

One of these cool new tools is our **Questions and Answers** section (see page 14). Where did we get this idea? From you, our readers. You asked for a department dedicated to addressing serious woodworking questions. We heard you, and our experts are now standing by.

Of course, those magical mystery tools you always found in our **Stumpers** department aren't going away. Instead, we've officially recognized that they've taken over:

Stumpers is now dedicated to old, odd and curiosity-provoking tools, and can be found on our last page.

I know that's where **End Grain**, our "readers' gallery" always resided! Don't worry, that department has been merged with **Letters** (see page 10). Your project photos, comments, criticisms and occasional high fives — all your reactions to the magazine — will now be in the same place. And, please ... keep 'em coming.



Maybe one of those pictures will be of a project you find in this issue. Again, our choices reflect a blend of the old and the new. For example, we asked **Rick White** to design his China Cabinet (see page 42) so it would go with a dining table and chair from previous issues.

And then there's **John Kelliher's** display cabinet, which provides a new home for some old medals — check out his touching story on page 36. **Mike McGlynn's** take on a Greene and Greene lamp (see page 51), updated to use electricity instead of gas, represents our final blending of the old and the new.

Whether you're looking for a well-worn favorite or a fresh new approach, I'm betting *Woodworker's Journal* will have what you need. Keep turning the pages, and enjoy.

Larry N. Storch

Your Q's & Our A's

When you send a question to our new department, we'll get your answer to you just as soon as one of our experts tackles your query — you won't have to wait for the next issue, except to see if you've won the drawing for the free tool.

MARCH/APRIL 2001
Volume 25, Number 2

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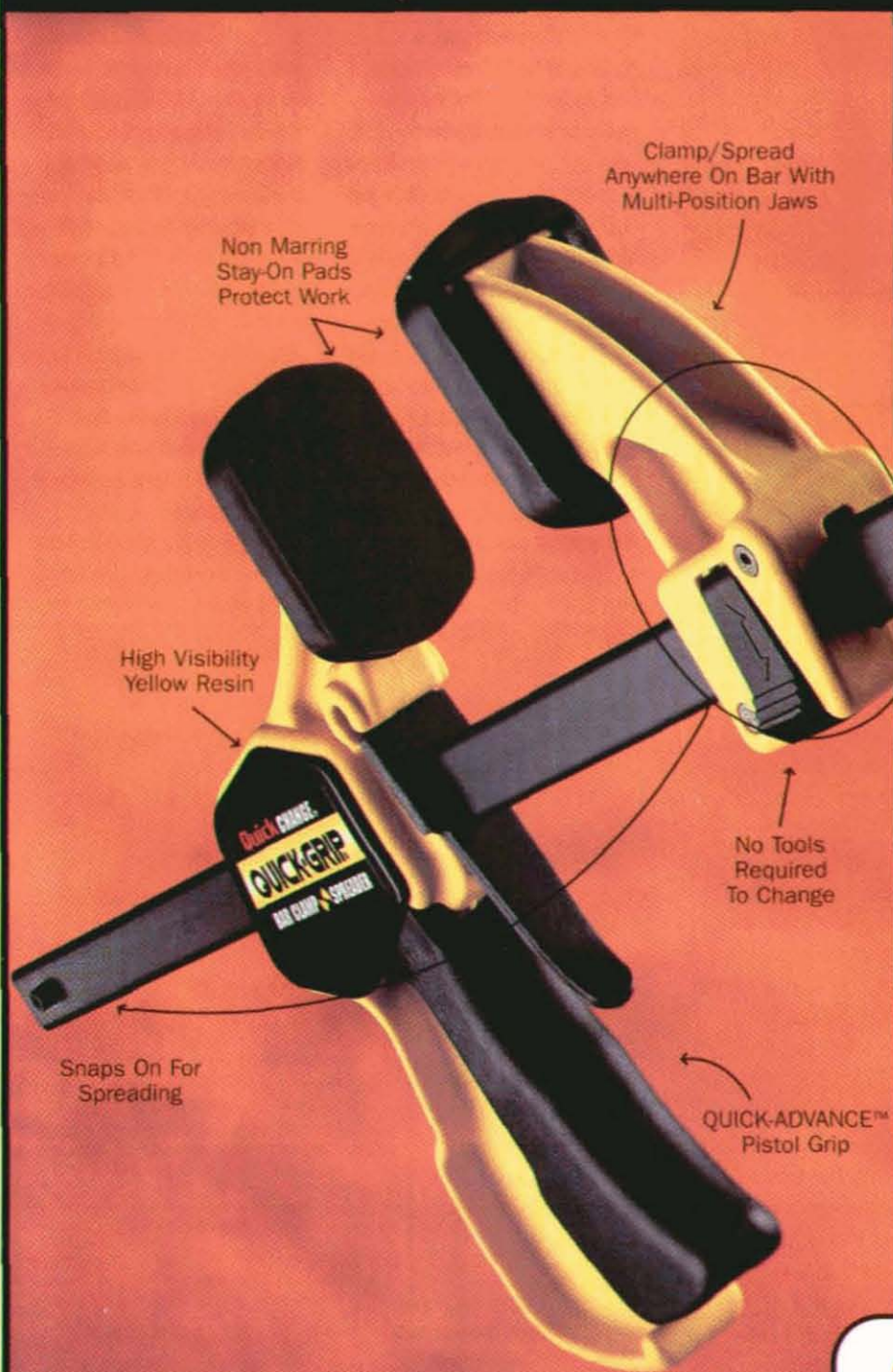
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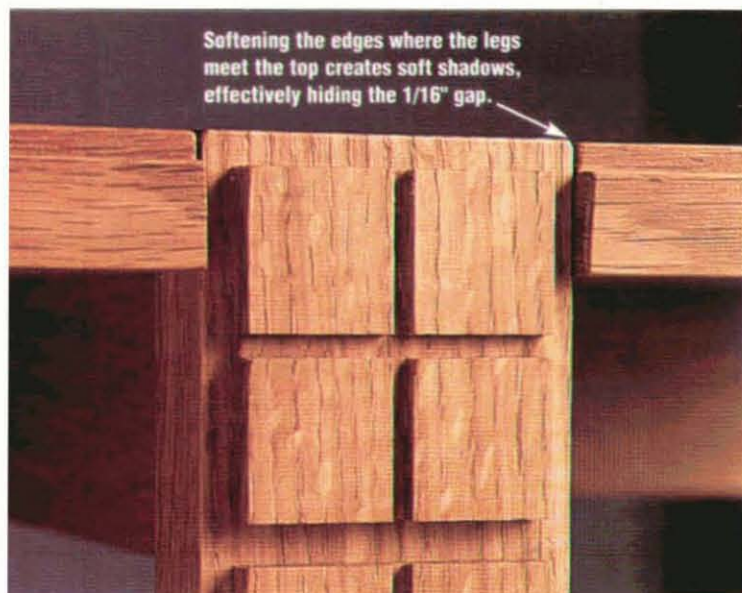
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Major Design Flaw ... or Hidden Detail



Softening the edges where the legs meet the top creates soft shadows, effectively hiding the 1/16" gap.

Tabletop Expansion

I am a full-time woodworker specializing in reproductions and studio furniture pieces. I was appalled at a major design flaw in the table featured in your December 2000 issue, (*Building an Arts & Crafts Table from Mock-ups*).

The table has two legs on the outside of the width of the tabletop. As the top expands it will act as a lever pushing on the tenons of the piece that joins the legs together. It will leave a gap on the inside of the legs as the top contracts. I can't imagine that the tenons will still be holding after a few seasons of wood movement. I realize the top was made from quartersawn white oak, and this may lessen the degree of fluctuation in the top; it will, however, move.

I hope you appreciate that my comments are not just subjective opinion; this detail of the table violates

a fundamental rule of furniture design and shouldn't have been featured in a magazine that enjoys such wide distribution.

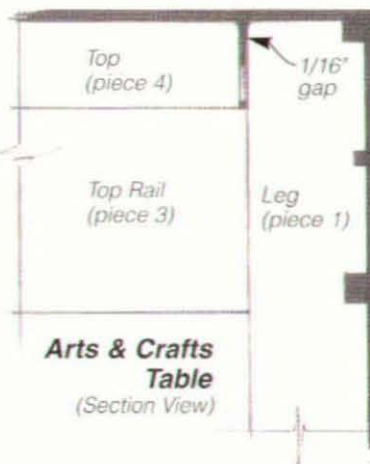
Ron Brese
via Internet

Ian Kirby Responds:

You are correct. A solid top needs room to move. My design allows for movement, but as the orthographic drawings appeared at one half scale, how that movement was accommodated is not clear. Because a magazine takes a subject, large or small, and fits it into a set number of pages, subtle but important elements can become obscured. Look at page 30. Had the front elevation drawing, "Top Rail and Leg," appeared full-size, the gap between the top (piece 4) and the leg (piece 1) would have shown as 1/16" and been much easier to see than the 1/32" gap actually displayed. On page 32, the top photo in "Making the Motif" shows the softened edges and gap. Finally, at the end of the article, there is a reference to softening the edges.

However, thank you for an opportunity to expand upon my design and technical thinking. My aim was to take a further step along the Arts & Crafts tradition. The motif of the four squares is one of the most attractive and enduring of that movement. I didn't want to put the motif at the top of the leg, only to have it hidden by the transom effect of an overhanging top. The leg-through-top detail is standard fare with a dimensionally stable material (e.g., MDF), but it's counterintuitive with solid wood. Nevertheless, I was determined to show the pattern value of the square motif to advantage ... so, how could it be done?

It's all about shadows. By radiusing the mating edges of the cutouts between the top and the legs, the resulting soft shadow effectively masks the 1/16" gap. If the gap changes due to shrinkage or expansion, the change is



The 1/16" gap between the top and legs allows for possible expansion. The gap is disguised by softening the top edges of the joining pieces.

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barely detectable, even more so because the soft shadow is in sharp contrast to the hard shadows that define the four square motif.

Now, how did I decide on the size of the gap? We know about the hygroscopic nature of wood and we know that there is a differential between tangential and radial shrinkage in the ratio of about 2 to 1. However, we don't have wood movement tables to refer to for definitive answers. Instead, we do things empirically.

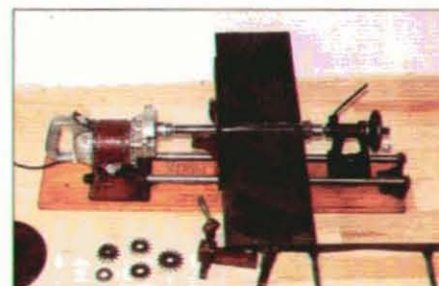
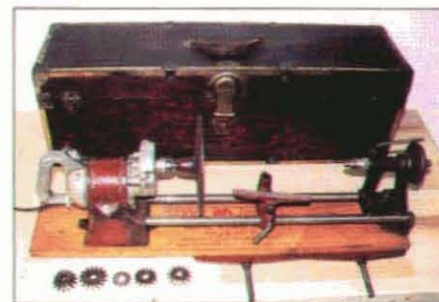
Kiln drying is a scientific operation, and most

hardwoods are dried to about eight percent moisture content. Homes are better climate controlled than ever, offering a more stable environment. The top is made of quartersawn material and screwed to the frame on center; that leaves only 9" on each side. I'm confident that a 1/16" gap leaves ample room for wood movement. A final observation: every piece of furniture I've ever made has shrunk after leaving the shop, not expanded.

*Ian Kirby
Milford, Connecticut*

Found: 1929 Multi Tool

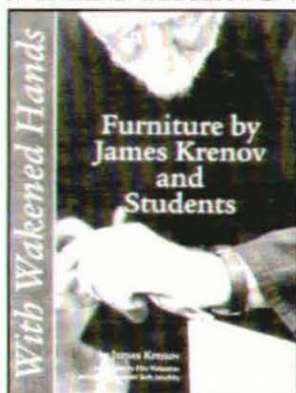
I was at a friend's house a while back, and he gave me a lathe that he didn't think he would ever use or would want to. I was wanting a lathe, wood or metal, so I told him I would take it. It was in its own carrying case and looked in really good shape, so I brought it home. Later, when I had time, I got it out of the case and set it up in my shop and discovered it was a wood lathe, a planer, a table saw and a sander all in one, depending on how it was



This 1929 woodworking "shop" was restored to working condition by reader James Payton. Watch your fingers, James!

Continues on page 12 ...

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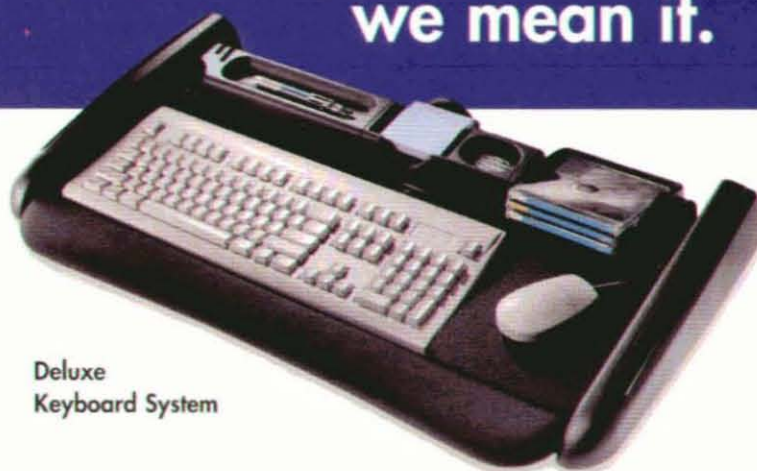
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configured. Also in the case was a large envelope with a brochure about the machine and all available accessories, a sale flier, and a receipt for the purchase of the machine.

To my surprise, it is a Red Jacket woodworking shop, made by Waco Tool Works from Chicago, Illinois. The tool was purchased in 1929 for \$129. Apparently it was purchased with a jig saw attachment, but I don't have that piece. I have recently cleaned it up and had the motor repaired and now display it in my shop, in working condition.

James Payton
Weyauwega, Wisconsin



Chess Set Remembered

Way back in January/February 1992, *Woodworker's Journal* published a plan for a chess set. I fell in love with the plan but was intimidated by the project. The idea of veneer and band sawing to that level was something that would have to wait. Through the years, I have worked to improve my skills and your magazine, with its outstanding projects and articles, has been at the forefront of these efforts.

Now retired, I was looking for a special gift to make for my son and remembered the chess set. The results you will find in the accompanying picture. You may notice that I have taken some "wood license," using a piece of holly I cut and dried in Oregon for the edging and drawer fronts, walnut and ash for the board, cocobola for the drawer pulls, and walnut and ash for the chessmen.

J.M. White
Victoria, British Columbia

Safety First: Learning how to operate power and hand tools is essential for developing safe woodworking practices. For purposes of clarity, necessary guards have been removed from equipment shown in our magazine. We in no way recommend using this equipment without safety guards and urge readers to strictly follow manufacturers' instructions and safety precautions.

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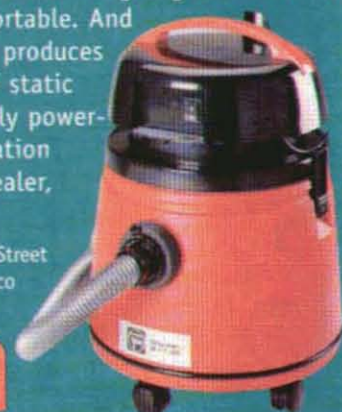
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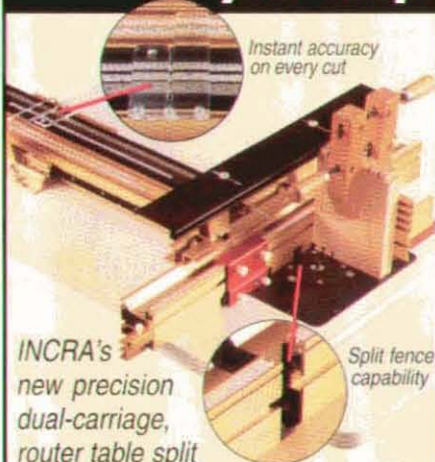
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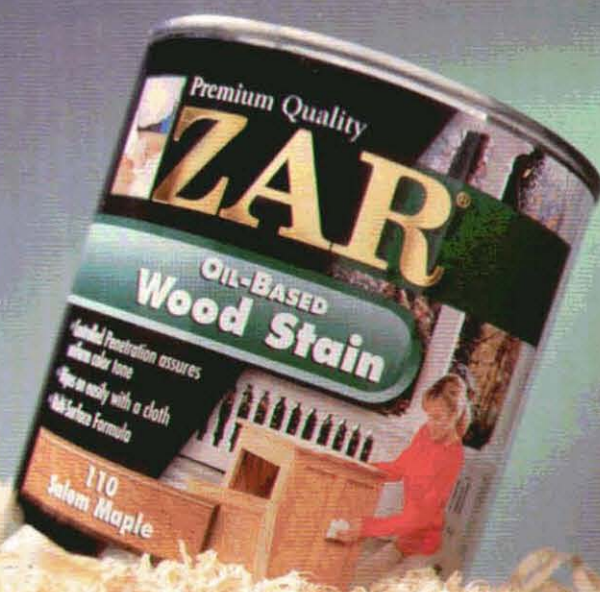
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Radial Arm Saw Recall Underway

Q I was recently on a discussion board at woodworking.com and saw mention of a recall on Craftsman radial arm saws. What, exactly, is being recalled and where do I get more information?

*Mike Austin
Lakewood, New Jersey*



A If you're the owner of a Craftsman radial arm saw built between 1958 and 1995 (about 3.7 million were sold) look for the plate on the front or side of your saw. If you see a model number beginning with "113," you're going to want to go online and point your browser to www.radialarmsawrecall.com or call 800-511-2628 to see if your model will accept the free blade guard repair kit from Emerson Tool Co.

My 1977 10" radial arm saw carries a model number starting with 113, so I called the number above. I was told that my particular model was one of the 16 models (out of some 300) that would not accept Emerson's new guard. I was given two choices: continue using the saw "as is" or send in the motor for a \$100 rebate. If I decided to accept the rebate, Emerson said they would send me an empty box with instructions

on removing the motor from my saw. I'm to send the motor back (they pay all postage) and shortly thereafter, a check for \$100 will be headed my way. According to Emerson, anyone can select the rebate option, as long as they're willing to part company with their saw's motor.

— Larry N. Stoiaken

Q I have enjoyed the articles and plans in your magazine for years. Recently, I have come across a few plans that have angles I am not sure how to cut. Suppose the plans call for an angle of 98 or 110 degrees. Your miter gauge only goes to 90 degrees. What is the best and safest way to figure and cut this type of angle?

*Chuck Bell
Laurel Hill, North Carolina*



A To cut angles greater than 90 degrees, you have to cut "the other way" on your miter gauge. For example, if your cut is 110 degrees, that's 20 degrees greater than 90. Therefore, you need to go 20 degrees beyond the 90 degree mark on your gauge — which will

be marked as 70 degrees, since it's also 20 degrees less than 90 when you're "going the other way."

— Rick White

Q I've never used veneer before, but recently decided to build a table using mahogany veneers. I've heard some people say you can use contact cement as an adhesive for veneer — is this true?

*Ludwig Trier
Kansas City, Kansas*

A I am one of those people ardently opposed to contact cement for veneer. You can't be sure of getting it down tight without air bubbles, and any joints in the veneer will be susceptible to swelling and opening up with changes in relative humidity. The glue that is most preferred by most experts for veneering work is Unibond 800, a two-part adhesive that gives you enough assembly time and bridges any slight gaps between veneer and substrate. Personally, I use yellow glue for relatively small veneer jobs where I can work quickly enough. I've also used powdered plastic resin glue because of its long open time, but I don't advise it for very porous, blistered or wrinkled veneers. It doesn't bridge gaps very well. Finally, I have to say that your best bet for this particular project would be to locate a commercial cabinet shop somewhere in

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your vicinity that has a hot press. Most people who own these contraptions will be glad to lay up the top for you. Tape up your face and backing veneers, and truck everything over there for glue-up. They use a special thermosetting PVA glue that sets in about five minutes, and the job is as good as it gets. They might even be willing to sell you the flakeboard for the substrate, saving you the hassle of buying and schlepping your own board around.

— Ellis Valentine

Q My wife gave me a spray gun for my birthday. I plan to use it for finishing a chest of drawers with polyurethane. Are there any specific tips I should know about?

Andy MacGregor
Coralville, Iowa

A When spraying polyurethane or varnish, reduce them about 20 percent with acetone (not mineral spirits). Spray a VERY LIGHT mist coat onto the wood. It should NOT look wet. Let it set up



for about 10 minutes so the acetone evaporates. Now spray a light wet coat over the partially set mist coat. The now tacky mist coat will help the slow drying oil varnish "hang" without sagging on vertical surfaces.

— Michael Dresdner

THIS ISSUE'S EXPERTS

Larry N. Stoiaken is editor in chief of *Woodworker's Journal*.

Rick White is a master furniture maker and contributing editor to *Woodworker's Journal*.

Michael Dresdner is a nationally known finishing expert and author of *The New Wood Finishing Book* from Taunton Press.

Ellis Valentine is a former editor of *American Woodworker* and the founder of *WoodCentral.com* and *WoodFinder (Wdfinder.com)*.

Bruce Hoadley is a professor of wood technology at the University of Massachusetts and the author of *Understanding Wood* from Taunton Press.

continues on page 16 ...



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QUESTIONS & ANSWERS

Q I'm friends with an almond grower who recently offered me the opportunity to occasionally use some wood from his trees. What are the qualities of almond wood, and how is it best put to use in the woodworker's shop? I can't seem to find any info on it.

Kirk Appleton
Los Angeles, California

A This is a tree that, even to woodworkers, seems to be much more important for food production than for its wood. Native to North Africa and Western Asia, it has been introduced extensively in California because of the nuts it bears. The almond tree is a small,



Photos courtesy of Blue Diamond Growers

spreading tree from the family Rosaceae, genus *Prunus*, species *Amygdalus*. *Prunus* is the same genus as cherry, and the wood does share some qualities with cherry. Its density is about the same, and the wood color is a reddish brown with distinct light-colored rays that may fleck against a darker background on a radial section.

We do have a sample of almond wood in our collection at the University of Massachusetts, which seemed very brittle to me. Occasionally used in marquetry or turning — likely because of the small size — it's of limited commercial importance.

— Bruce Hoadley



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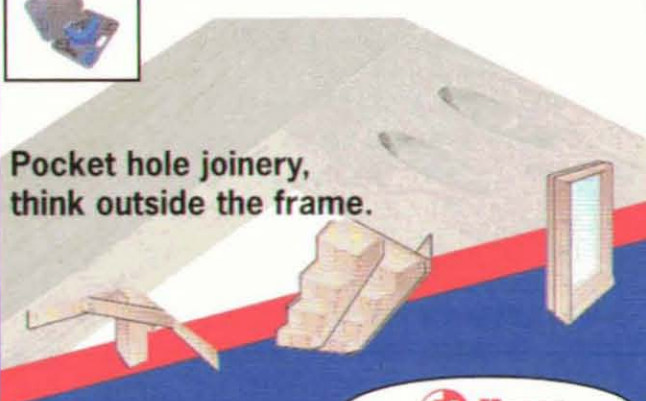
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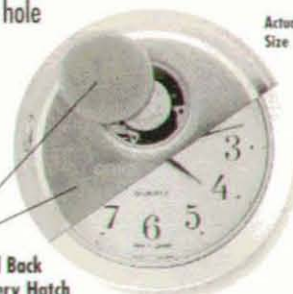
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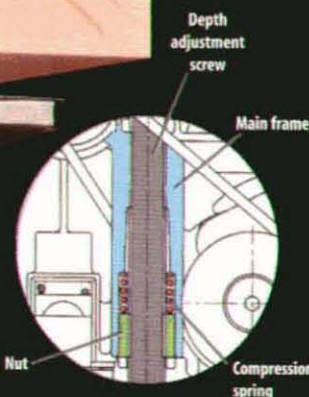


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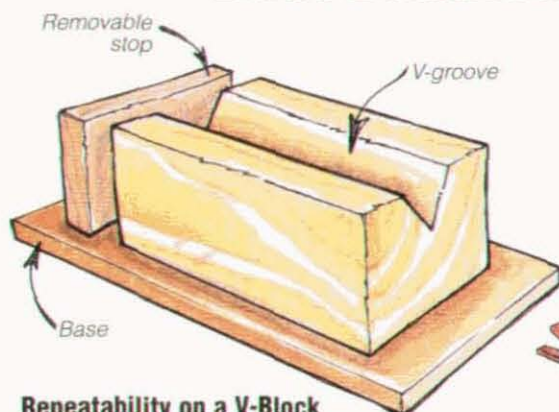
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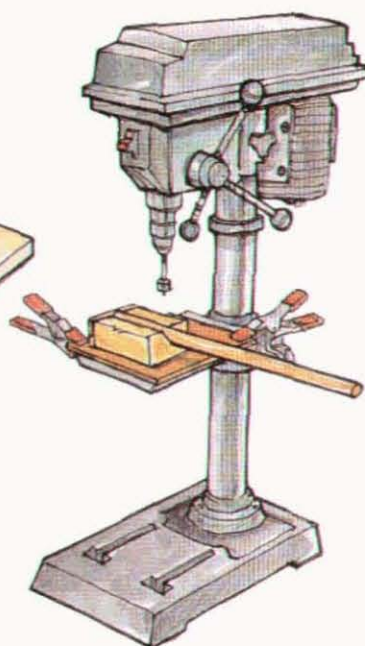


Repeatability on a V-Block

Sometimes the simplest solutions are the best. When I needed to do some drilling with a V-block, I thought I'd have to re-measure every piece and restart the drill press for each cut. It occurred to me that I could measure the first one very carefully and position it in the V-block so the end being drilled was at the end of the jig. Then I clamped the V-block to the drill press table and made my first cut. A block of wood held flush to the end of the jig was the only alignment tool I needed for subsequent drillings. Using a loose

block was better than fixing an end onto the V-block, because it was far easier to sweep away the chips which would otherwise plug up the bottom of the V-block.

*Hugh Foster
Manitowoc, Wisconsin*



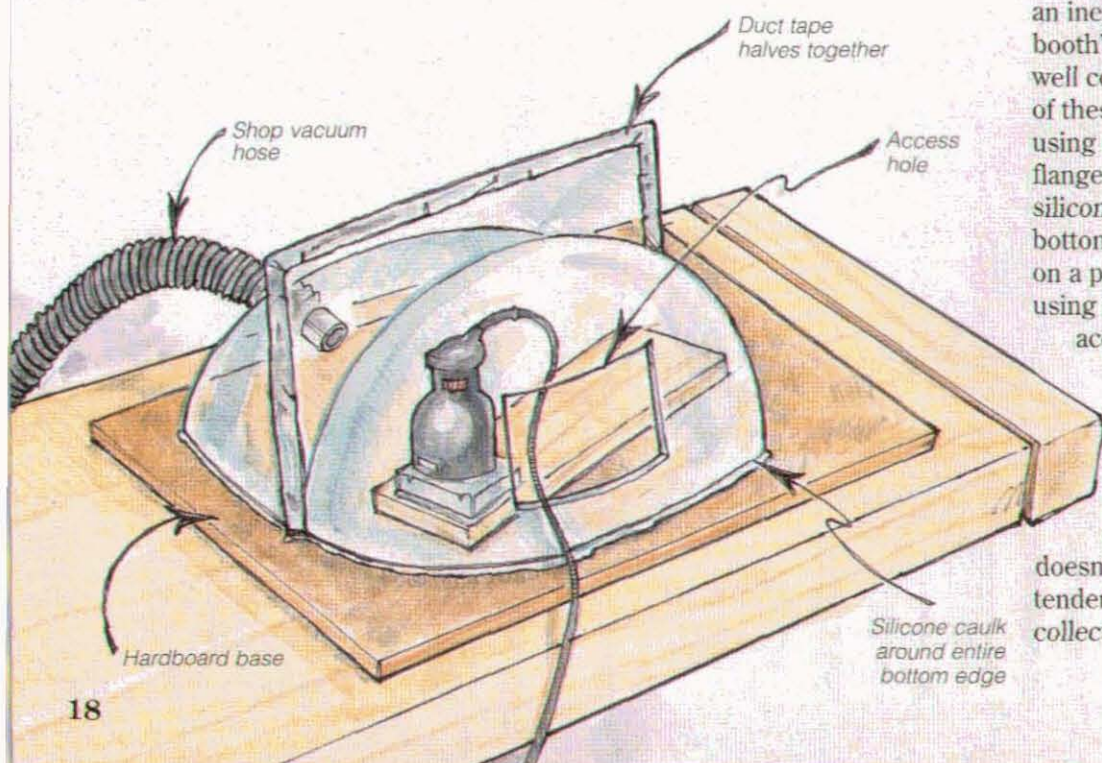
Sharpener's Shortcut

We all know that our turning chisels must be razor sharp to do their best work, but I find it hard to really do a good sharpening job on some of my chisels ... especially those with a curved cutting edge. How do I make sure I'm sharpening the entire curve?

I use one of those blue felt-tipped marking pens to coat the entire cutting edge of the tool. Using this coating as a guide, I can see how I'm doing. I have found that I can do a much better sharpening job using my marker as an aid.

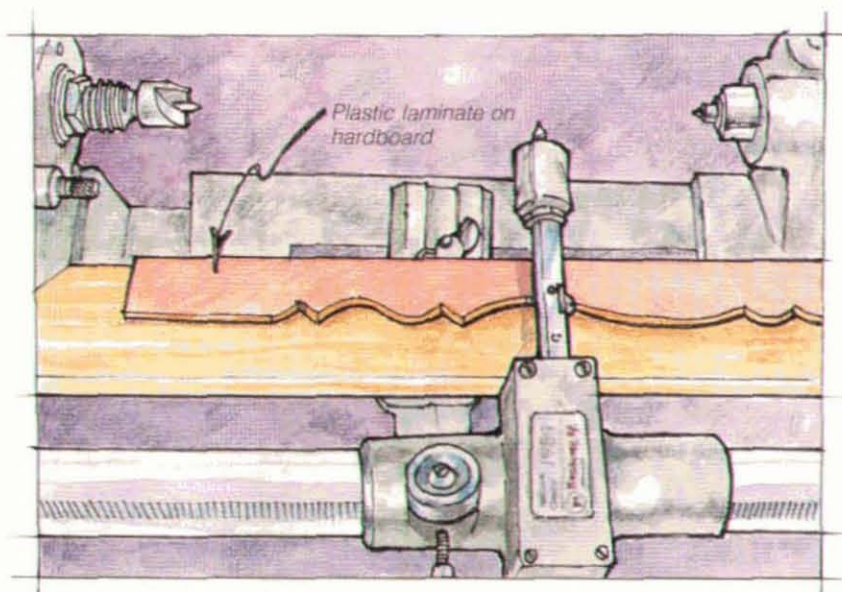
*Howard Moody
Upper Jay, New York*

An Easy-to-Make Tabletop Sanding Booth



My shop doesn't have an airborne dust collection system, so I created an inexpensive benchtop "sanding booth" using clear plastic window well covers. I began by joining two of these well covers back-to-back using duct tape along the mounting flanges. I then ran a thick bead of silicone caulk around the entire bottom edge and set the assembly on a piece of hardboard. Next, using a sharp utility knife, I cut an access hole big enough to get my hands and forearms inside to work. Finally, at the back, I cut a hole of the same diameter as the nozzle of my shop vacuum. Unlike downdraft systems, this unit doesn't fight dust's natural tendency to float, but rather collects it right out of the air.

*R. B. Himes
Vienna, Ohio*

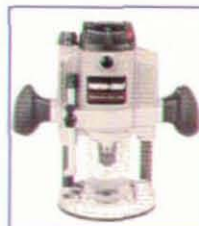


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*Dick Dorn
Oelwein, Iowa*



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Carving Out Memories

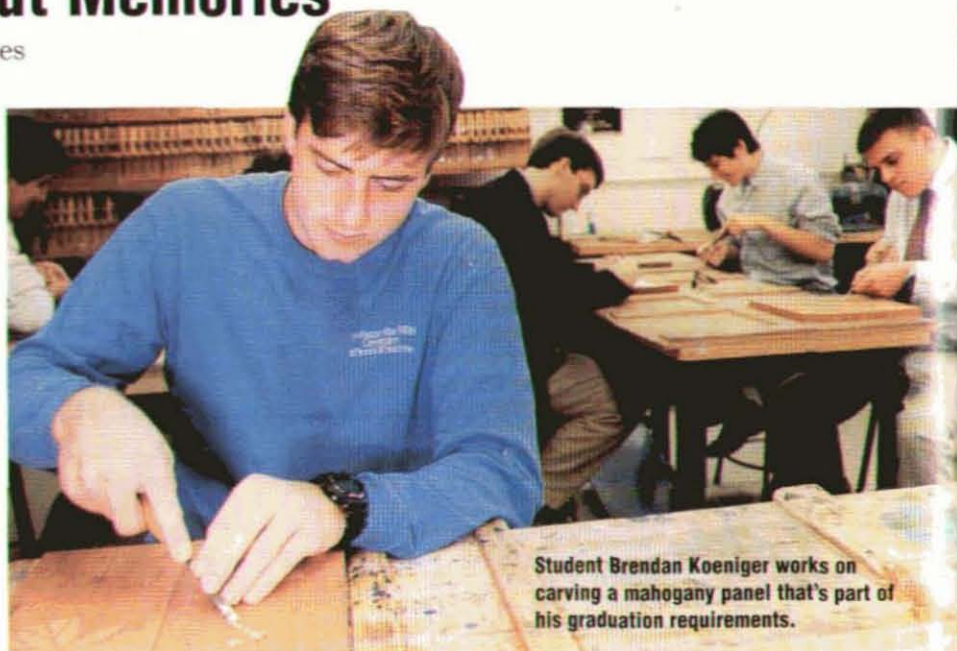
By Joanna Werch Takes

Organized Graffiti:

(Carving) Knives to the Walls

Students at the Belmont Hill School always leave their marks on the walls — just like they're supposed to. Since 1923, over 3,000 of them have picked up a chisel and created what woodworking instructor Steven Kaplan calls "organized graffiti": the 12" x 12" carved panel that's part of their graduation requirements.

It's illuminating to look at how subjects have changed over the years, Steven says. For example, if you look around one of the meeting rooms at the Belmont, Massachusetts private boys' school, he said, "You see a lot of war images. There's one of Mussolini running, with a symbol of Italy in the background; one with the face of Churchill; and another featuring American warships on the waters. If you look at the dates and the names, it's '44, '45, '46. Those are images about the times." In contrast, he said, panels from the early 1990s are more whimsical, with subjects like advertising logos Tony the Tiger or Coca Cola®.



Student Brendan Koeniger works on carving a mahogany panel that's part of his graduation requirements.

Whatever their choice of subject, the panels mean that the boys "leave their mark on the campus," Steven said. It's a tradition that dates back to the school's first headmaster. One reason the practice has continued, says Steven, is that the panels symbolize the boys' saying, "I'm able to handle whatever you're going to give me."

"I tell my students that when you're 14, 15 years old, you have very little control over your lives. You can't control whether you go

to school or not — they can barely control their bodies — but you can control what happens to a piece of wood. They like that."

Even students who have never taken a woodworking class are expected to complete a panel. To help them out, Steven spends a 40 minute class showing them how to hold the tool and safely push it into the wood, then breaks the work down into a series of small tasks.

photos by John Gillooly



Belmont Hill woodworking instructor Steven Kaplan says there's "about 10 more years' worth of space on campus" for students' carvings.

This year's graduates will chisel out 72 new panels for Belmont Hill's walls. They're the first thing campus visitors notice.

"A lot of times the kids, after being shown steps one and two, will intuitively figure out steps three and four," he said.

Figuring out the panels' subjects, however, is up to the boys. They can follow three different approaches, Steven says. They can choose an artistic image that's "neat to look at", something personal to them — like hockey skates for a hockey player, or something that reflects the times. Of course, they've had the opportunity to think about their panel since their first day at Belmont, when part of orientation involves presenting each student with a piece of paper and asking him to draw what his panel would look like if he had to do it right then. Panels from students



who graduated in previous years line the hallways, the dining hall walls and more.

Steven carved his own panel in the early 1980s. "I did my panel on the last M*A*S*H because it was important in my life at the time," he said. Although he might choose a different subject today, Steven appreciates that he, and his students, have had the opportunity to leave their mark on the walls.

Woodworking at the Inn

Period Furniture Classes

Ben Hobbs intended to be a teacher: a math teacher. He ended up teaching furniture making techniques to guests at a bed and breakfast.

Ben and his wife, Jackie, bought their inn in Hertford, North Carolina, more than 20 years ago, and Ben started collecting antique furniture to put in it. Repairing those pieces revealed an aptitude for furniture making, and "one thing led to another," he says. For a couple of decades he has earned a living with handcrafted reproductions of early American furniture, "some of the finest furniture this country has produced," he says.

Dept continues on page 24 ...

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Chippendale style chairs are one of the period furniture reproductions Ben Hobbs' students make while staying at his bed and breakfast.

When enough of the B&B guests had asked him if he taught classes, he decided he should. For the last three years, Ben has offered week long furniture-making classes. Three to six students of all skill levels build and finish such typical 18th century items as a Chippendale chair, Queen Anne bench, bedside table or pencil post bed.

Although Ben himself did take a class from a cabinetmaker at a community college, he says he learned almost everything about furniture making "the hard way." The furniture making techniques he teaches his students, he likes to think, are done in the most logical and efficient way. "We teach it like we build it," he says in his Carolina drawl. "Everybody has a different way of doing things, but we have the best way." The "we" encompasses his son Matthew, who has studied decorative arts at the Winterthur Museum and is now helping his father.

Ben uses primarily hand tools, although he employs a few power tools, such as the mortising machine and the band saw. He takes care of stock preparation, so that students can concentrate on the hand work.

Ben Hobbs, far right, prefers small classes for his instruction in pre-Civil War furniture construction.

In the bedside table class, for example, students use hand tools to practice basic joints: half laps, dovetails, and mortise and tenons.

In the pencil post bed class, Ben teaches students to lay out, mortise, tenon and fit the rails,

make the headboard, shape the posts and sand and finish the bed.

Ben says students with a little experience under their belts are often the ones who gain the most from the classes. "They know enough to have a lot of questions," he says. But most students — of any level — do fine. Most take a completed piece of furniture home, although pieces that take longer may have to be stained later.

Class offerings this year will expand, with students able to choose among 21 classes offering 13 pieces, from a Queen Anne tea table to a sideboard. Some people want to come back to make additional pieces, Ben says. "The tools are here; the materials are here. It's

easy to build a piece here, but you don't need five bedside tables."

Reproduction classes at the Beechtree Inn focus on furniture from American Colonial times to a couple decades before the Civil War — Ben calls 1820 his cutoff date. He thinks history needs to be a living part of our lives for people to see and value it. That's why, in addition to working with period furniture, he carts pre Civil War buildings to the inn's property and restores them. He's up to 14, including a jail, which he will reconfigure into cottages as part of the inn.

"I like [the buildings] that are completely in shambles," he says, "so no one can accuse me of ruining their historical value when I rebuild them." He furnishes them with period reproduction pieces he turns out, as well as such amenities as air conditioning and modern plumbing.

More information about furniture-making classes at the Beechtree Inn can be found online at www.hobbsfurniture.com or by calling 252-426-7815.

— Lois M. Baron



A Humble Tool's Early Days: Screws Get Some Respect

Most woodworkers keep some screws around — in the bottom of a toolbox, in glass jars, lying on a workbench. Witold Rybczynski's new book is going to increase your respect for this humble tool.

One Good Turn: A Natural History of the Screwdriver and the Screw began as Witold explored the invention of the screwdriver — unlike most hand tools, it doesn't date back to Roman times — but he soon found the screw more interesting. "The screwdriver is such a simple tool, we hardly think of it like a tool. It's kind of like televisions: they're all over the house," he said.

"It's easy to imagine how somebody would invent a screw-driver. It's much

more interesting to consider how someone would invent the screw itself."

Witold's book traces both questions, becoming a whodunit as he pursues the inventors of both the screwdriver and the screw.

Along the way, he gained an appreciation for mechanical genius. "We understand craftsmanship, but inventing a tool requires real genius, and I don't think we appreciate it enough," Witold said. The combination of industrial tools

and craftsmanship, which he describes as working with hand tools, surprised him. "The Industrial Revolution destroyed

craftsmanship, but it also depended on craftsmanship. They had to build machine tools with incredible precision — completely by hand," he explained.

In the book, he notes, "the modern screw ... is a remarkable little object." To find out who invented it, you can locate Witold's book through Simon & Schuster, www.simonsays.com. The ISBN number is 0-684-86729-X.

Shop Talk continues on page 26 ...



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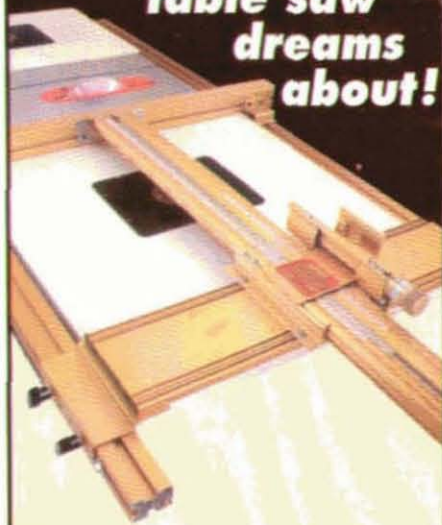
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Grand Pianos

Working Wood for Steinway

Frank Pollaro gained his reputation in the woodworking world through reproductions done in the style of Art Deco master Jacques Ruhlmann. Lately, he's added to that reputation through association with another famous name: Steinway, as in the pianos.

A couple months ago, Frank unveiled a Steinway Art Case piano he'd designed. It was one of the rare commissions the 140-year-old company gives to outside firms. Woodworkers asked to participate are those who have become well known for their personal style.

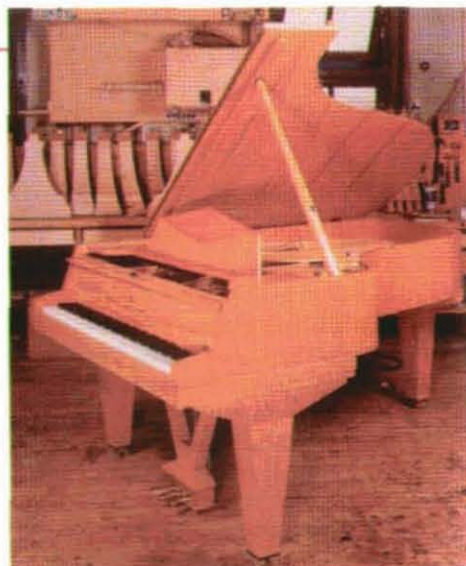
Frank certainly put a lot of style into the grand piano. Veneered entirely in satinwood parquetry, the case was encircled by a series of diamond motifs that seemed to go through dramatic figure-ground reversals depending on the viewing angle. The diamonds were repeated on the inside and outside of the top, on the legs, the strut ... even the matching piano bench. The finish was an impeccably rubbed high-gloss lacquer, which made the wildly figured satinwood veneer glimmer like gold.

It sounded great, too — smooth, clear and subtle, with a very round tonality, bright but not brassy —

*photos courtesy of
Pollaro Custom
Furniture, Inc.*



Designing a piano for Steinway means collaboration: case shape, keys and pedals must follow their guidelines.



A Steinway is an impressive piano — especially with Frank Pollaro's diamond veneer patterns.

when jazz pianist John Regen tickled the ivories in the New Jersey workshop of Frank's Pollaro Custom Furniture.

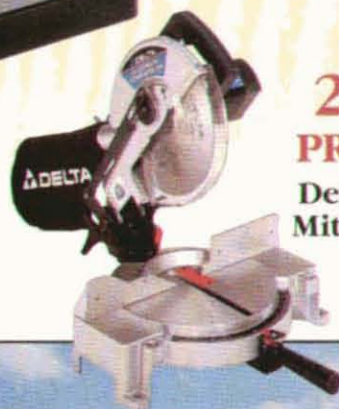
This wasn't the first time Frank had designed a Steinway — his "Rhapsody" model, below, honored George Gershwin's 100th birthday. Other pieces are at www.pollaro.com or call 973-675-7557.

— Ellis Walentine

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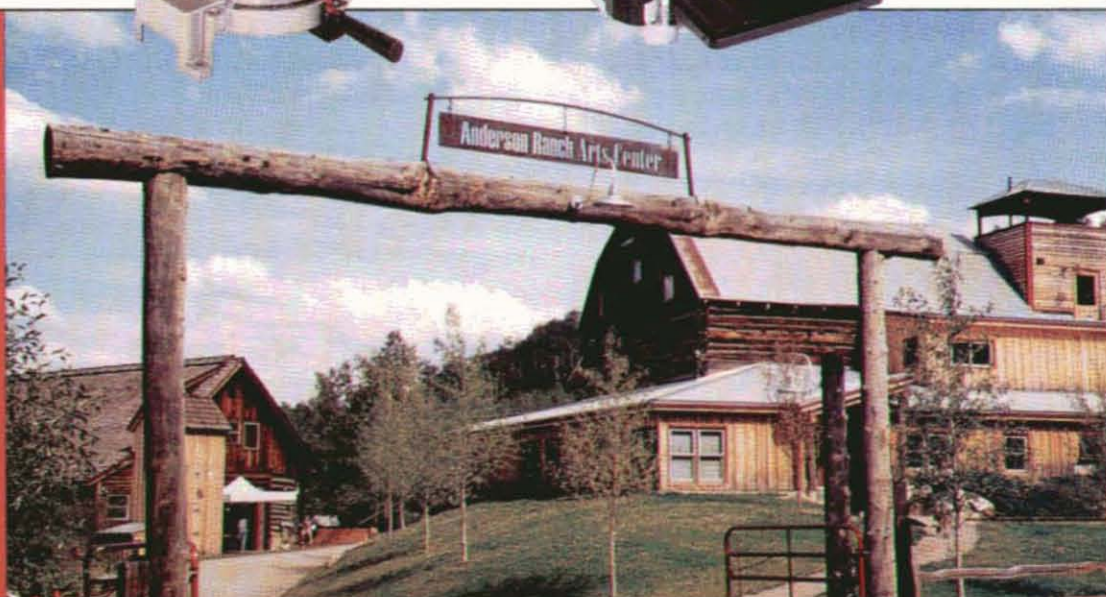


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Drafting a Woodworker's Life

By Joanna Werch Takes



Gail Fredell often makes trays while planning designs for larger projects.

A pedestal table (right) is a painted pine base and a bubinga top. Gail said her table series started as portraits. "It's obscure, but that's what they are."



Gail Fredell says her woodworking projects have a "very architectural kind of quality." That's not surprising, since architecture was her first career. She stuck with it only four years, though, before admitting that she preferred the opportunity woodworking gave her to be in the shop, making things, instead of in an office, letting someone else execute her designs.

Twenty years later, Gail's still doing woodworking, and, as program director of the woodworking department at the Anderson Ranch Arts Center, she's also helping others get out of the office and into the shop. She teaches, she arranges artist residencies — and she does woodworking.

For the past couple of years, she's been building mostly benches and tables. The architectural influence, she said, shows up in how she constructs her pieces: "Things are finished as individual components and assembled at the end." In addition to wood, she uses a lot of stone and metal, as well as paint, to highlight the individuality and contrast of the different elements.

"The choice [of material] comes with what works in the piece," Gail said. With wood, "I choose for color and a graphic kind of quality, whether it's pattern or grain." She also tends to choose solid wood — mostly because she doesn't like working with veneer.

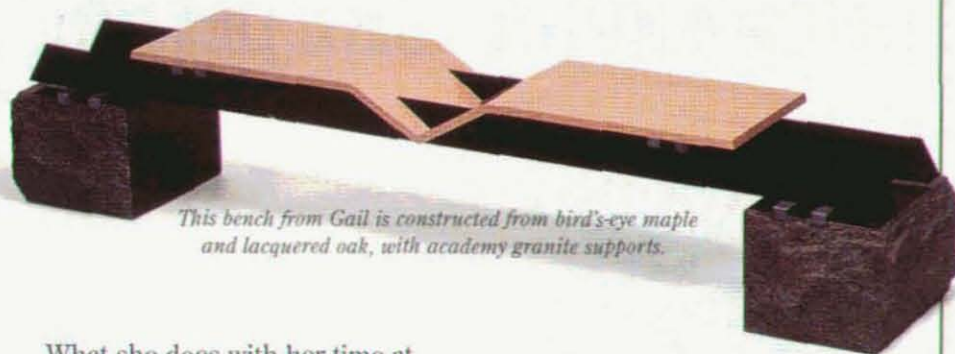
While Gail's designs are functional objects, like entry hall benches, they also have a more spiritual quality to them. It wasn't always that way: "In the early 80s, the furniture I made was architectural; slick, with lacquer and chrome," Gail said. "It was what everybody was doing, but it was very abrasive. I thought, 'I don't know if this is the direction I want to keep going.'"

Inspired by the ocean in San Francisco, where she was living, and the mountains near a family cabin in the Sierras, she began incorporating landscape elements into her work. For example, "you might look at an entry hall table and say 'that kind of looks like water,'" she explained. Ironically, the Rocky Mountain

backdrop to her current home and job has not provided the same inspiration. "I don't know what to do with it," Gail confessed.

The pine, painted oak and maple bench (left) plays up individual elements.





This bench from Gail is constructed from bird's-eye maple and lacquered oak, with academy granite supports.

What she does with her time at the Ranch, near Aspen, Colorado, also involves more than her own woodworking. She invites faculty, makes sure machines are running and supplies are where they need to be, supervises a team of assistants and teaches her own intensive class. "If you're having

a really good day," Gail said, "then it's like being a conductor: getting everything to flow well. The trick is to anticipate everybody's needs and have this little shop equipped well enough to take care of anything that comes up."

Gail had previously taught woodworking at the California College of Arts and Crafts in Oakland, and was glad to get back into it when the Anderson Ranch position came open. Although she enjoys her own work, she says, she sometimes felt working on her own was "too self-indulgent." Besides, she added, "It can be very isolating, working in a shop. I feel [teaching] makes more of a contribution."

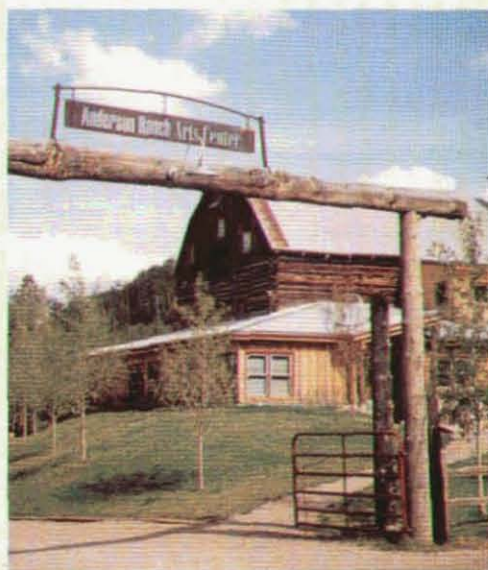
Among those she's taught, Gail noted, is her father. As a child, she had helped with his home and garden projects. The family didn't have any machinery, so, "by the time I went to college, I was skilled with hand tools," Gail said. After she graduated, her retired father learned more advanced woodworking from Gail.

Following that architecture degree, Gail herself did study woodworking — she has a master's from the Rochester Institute of Technology — but she says she's long outworked any romantic feelings about the material or the craft. For her, she said, the appeal is "more the designing of things and the problem solving, in terms of letting the design work the way I want it to, and the technical problem solving that happens as you go through the process of making things."

*In her previous career,
Gail Fredell said,
"I kept wishing
I was in the shop."
Now, she spends
most of her days in
the shop at the
Anderson Ranch.*



Anderson Ranch: Classes Start Soon



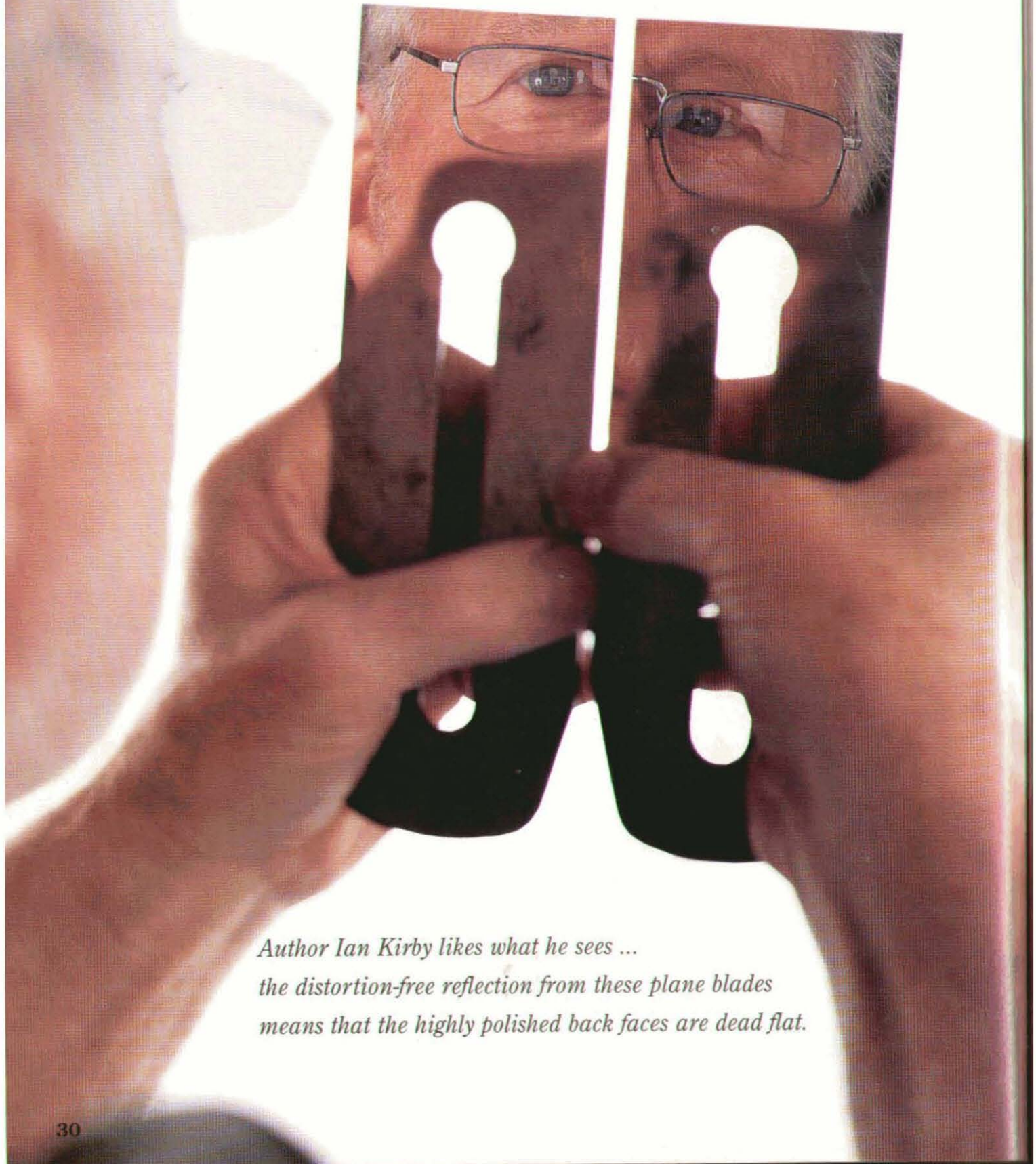
This year's Anderson Ranch woodworking courses will include a class taught by Gail Fredell on Beginning Furniture Design & Construction, for those who want "an introduction to making things work in a woodshop." For more information on this and other woodworking classes at the Ranch, call 970-923-3181 or visit www.andersonranch.org.



Gail Fredell, Anderson Ranch's woodworking program director, (back row, third from left) and her staff welcomed Woodworker's Journal associate editor Joanna Werch Takes (front row, center) to a class last summer. Sam Maloof (front, left) is a long-time supporter of the Ranch.

Put the Shine in Sharpening

By Ian Kirby



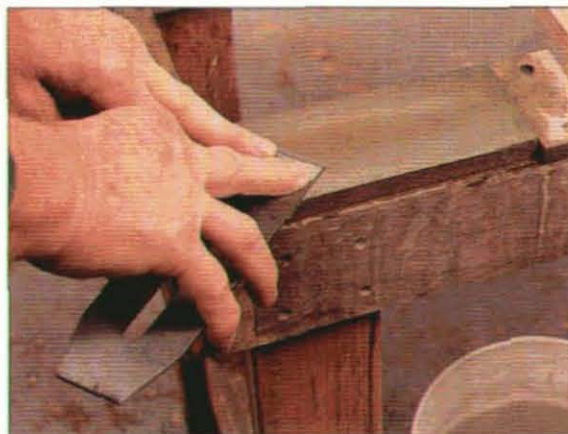
*Author Ian Kirby likes what he sees ...
the distortion-free reflection from these plane blades
means that the highly polished back faces are dead flat.*

... with Diamond Paste

Time was when you sharpened chisels and plane blades on an oilstone. Your options were limited to a Carborundum stone, an India stone, or — if you could afford it — an Arkansas stone. The grinding wheel was a sandstone cylinder about two feet in diameter and four inches wide. It revolved in a bath of water and was powered by a junior member of the shop cranking a handle.

An Explosion of Abrasives

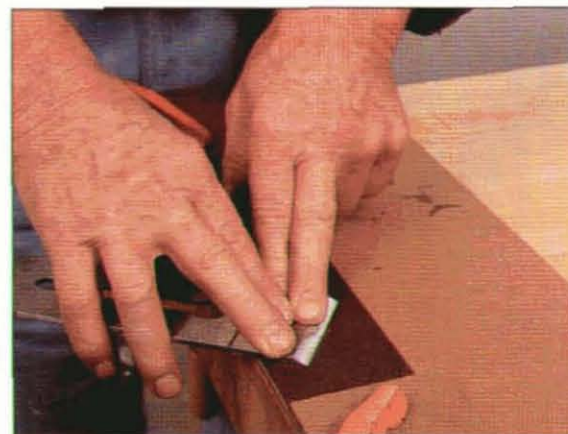
Today the sandstone wheel is a museum piece, we long ago ran out of junior shop members, and the once-limited choice of stones and wheels has exploded into a potentially confusing variety of sharpening products and methods. There are so many variables involved that sharpening is a very personal matter: the cost of the products and their availability, the speed of cut, shop space, the ease of setting up, cleaning up, and putting away, to name a few. This review of what's available today, from the tried-and-true to the very new, should help you choose what best suits your working methods and budget. This review is restricted to sharpening plane blades and chisels. Sharpening machines, other than a bench grinder, are excluded.



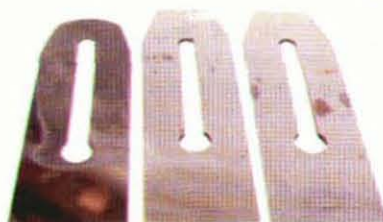
Waterstones are best used on a dedicated sharpening station. To be useful, the stones must be kept perfectly flat. Finest grit produces a smooth finish.



Diamond plates cut steel well. There's no water, no adhesives, no flattening, and no fuss. Of course, they are twice the cost of waterstones.



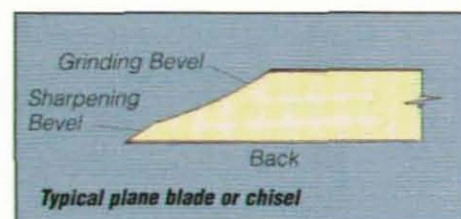
Coated abrasives are produced in a wide range of grits. Superfine grits produce a smooth finish and are inexpensive.



Measuring Sharpness

A cutting edge is formed by the intersection of two flat surfaces. The effectiveness of the cutting edge is determined by the angle of intersection, the smoothness of the two surfaces, and the hardness of the steel. Although sharpness can be "measured" by the age-old instruments of eye and thumbnail, the most practical test is the surface quality of wood as you cut and how much cutting you can do before the edge is blunt.

Plane blades and chisels are similar. To sharpen them, you prepare three faces: the back face, the grinding bevel, and the sharpening bevel.



Preparing the Back Face

The back face must be flat and it must be polished. A flat, polished surface reflects an image without distortion.

On a new blade, the manufacturer's coarse grinding marks remain on the back face and the bevel. These marks are tiny grooves — clearly visible through a 10X lens — which form random micro teeth where the back face and bevel intersect at the cutting edge. You can make a shaving with this blade, but

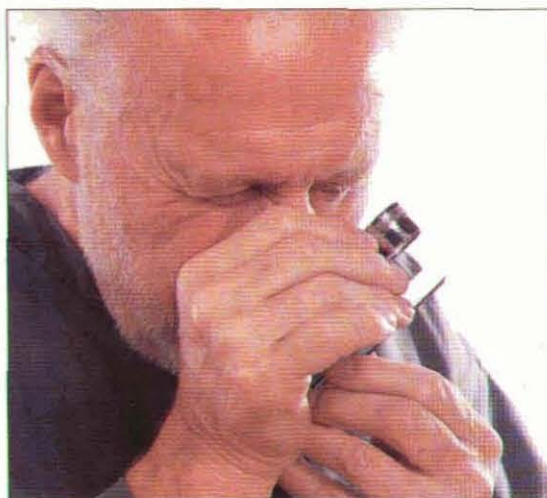
the wood surface will be scored with ridges. Also, with harder wood, the micro teeth will quickly break off, blunting the cutting edge. In other words, the flatter and more polished the faces, the sharper the cutting edge — and the longer it will stay sharp.

Whatever abrasive you choose, the starting grit is determined by the condition of the back face of the blade. Since new blades require the most work, start with the coarsest grit. Remove all the manufacturer's marks at the outset or else they will haunt you at later stages. The more pressure you apply, the faster the cut rate. Place the abrasive on a solid surface and work the blade with arms extended to add the weight of your upper body. First-time flattening jobs can be a lengthy chore, so you may prefer to sit on a high stool.

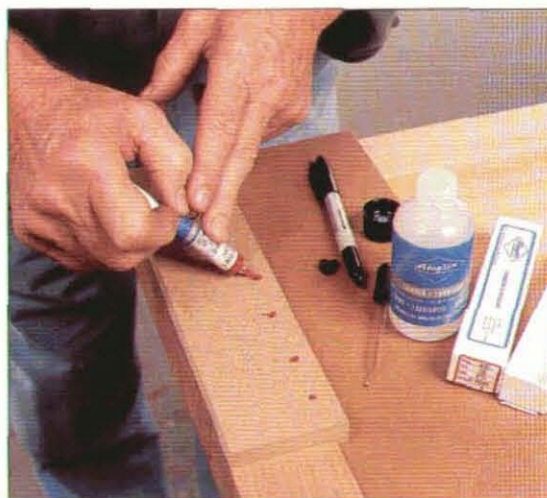
To flatten and polish the back face you could use any one of a combination of oil stones, waterstones, diamond plates, coated abrasives, and diamond paste.

Oil Stones: Oil stones were once the primary method of sharpening tools. They're still manufactured and mined and, because they resist wear, there are still plenty of them around.

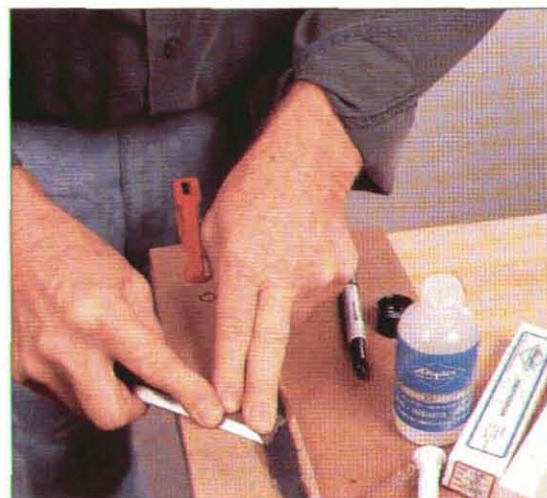
There are three basic types: Carborundum and Crystolon, gray color and made of silicon carbide; India, reddish-brown color and made of aluminum oxide, and a variety of natural stones; such as Hard and Soft Arkansas. If you have inherited some oil stones, they will almost certainly need flattening. Then, store them properly.



Check flattening progress with a 10X hand lens to confirm that you have replaced one set of marks with a set of finer marks.



Apply diamond paste in small spots to the MDF carrier plate. Identify each plate by grit size to prevent contaminating one size with another. For the same reason, wipe the blade thoroughly before moving to a finer grit.



Squelch and spread the diamond paste the length of the plate before starting to polish. The pastes come in different colors, but they all turn black in use.

Waterstones: Waterstones imported from Japan began to displace oil stones about 20 years ago. Although they wear more quickly than oil stones, they cut faster, and the finest grit produces a highly polished surface. The abrasive is aluminum oxide held in a soft bond of fine silica. The grit range of Norton stones is 200x, 1,000x, 4,000x, 8,000x.

Waterstones are readily available as singles, combinations, or packs of four. Properly cared for, they will last the average woodworker for many years and are well worth the investment of \$50 a stone.

Coated Abrasives: A coated abrasive consists of abrasive grains bonded to a backing by an adhesive. Those suitable for sharpening blades are composed of either aluminum oxide or silicon carbide bonded to paper, cloth, or polyester film.

Woodworkers routinely sand wood with aluminum oxide papers. Although the same product can be used for flattening the backs of blades, a better choice is the cloth-backed product designed for metalworkers. I use Metalite® aluminum oxide cloth, available in 8½" x 11" sheets, specifically formulated to cut steel. It's "closed coated," which means the abrasive grains completely cover the backing. The "open coated" woodworkers' product has about 50 percent coverage.

Metalite® comes in many grits, ranging from 80x to 600x. The cut is so aggressive at the coarser end that you may wish to wear work gloves. Coated abrasives in grits 1,000x and

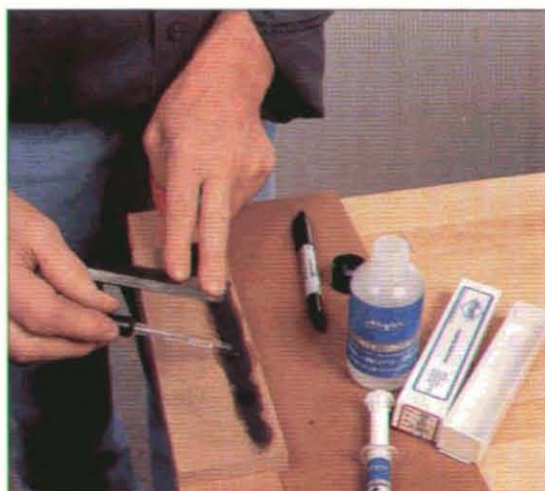
finer are commonly called microabrasives. As you work, periodically clean the surface with a brush or vacuum. Coated abrasives must be affixed to a firm, flat, smooth plate such as glass, Plexiglas™, or MDF.

Some products simplify affixing with PSA backings. Otherwise, use a spray adhesive, such as 3M Super 77. Spray sparingly and to the substrate only. If working within a short time frame, you can replace one strip with another several times with a single spray application. Over time the bond may become so strong that only a sharp chisel will remove the strip. Clean the substrate with a solvent such as lacquer thinner.

Diamond Plates: Since their introduction, industrial diamonds have become an integral part of the metal cutting and polishing industry. The plates are available in two basic types, monocrystalline and polycrystalline. Monocrystalline plates cut best and last longer, but cost more. These plates cut aggressively.

Diamond plates can be used dry, eliminating the mess and fuss associated with lubricants. Clean with a stiff brush or hold the plate upside down and tap it. You can also lubricate the plates with water or mineral spirits, which will wash out the particles as you work the blade. They are commonly available in grits of 220x, 325x, 600x, and 1,200x.

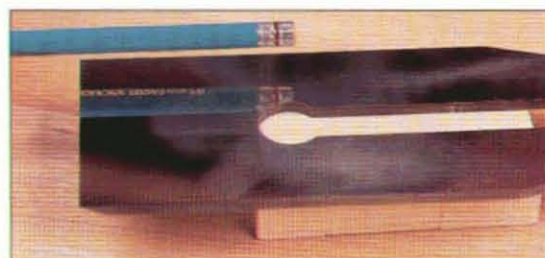
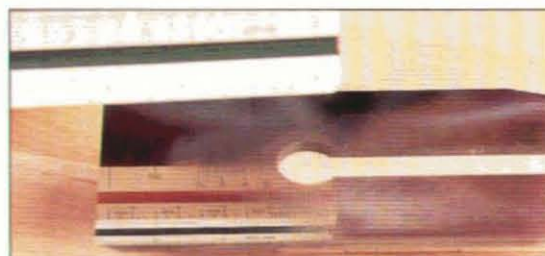
Diamond Paste: Diamond paste is a recent arrival on the sharpening scene. Like coated microabrasives, it's best used for final polishing after you



Add lubricant to help the diamond paste to cut at peak performance. Lubricant thins and extends the paste into a slurry. Use only one or two drops.



Resist the temptation to add too much paste. It won't increase the speed of your cut. Plan on an average polishing time of about five minutes per grit.



Distortion-free reflections of the architect's rule and pencil confirm the high degree of polish and the absolute flatness of the back face of the plane blade.

have flattened the blade by some other method. I've been working with it for some time and can confirm that the results truly shine — pun intended.

The components are few: just paste, lubricant, and a piece of MDF. Why MDF? Because it's made to an industry standard of density, thickness, and — most importantly for its use here — it's smooth and flat. However, brush the surface thoroughly before using it for the first time. Size the MDF like a typical waterstone.

Squeeze the paste sparingly onto the MDF carrier plate. If you overload the plate at the start, you will have to scrape paste from the edges of the blade to return it to service on the plate. The lubricant is applied even more sparingly — a drop here and there is all you need. As you progress from one grade to another, each on its own plate, clean the blade thoroughly with a paper towel so you don't mix coarser paste with finer. For the same reason, identify each plate and store in its own plastic bag. If you do foul up a plate, replace it with a new one. MDF costs pennies, and the loss of paste is negligible.

Manufacturers make the paste in many grit sizes. One day you may be able to buy them individually, but for now they are available as a 4-pack in grits of 30, 15, 6 and 3 microns.

Preparing the Grinding Bevel

The grinding bevel on a plane blade or a chisel makes sharpening easier and faster. By removing a large amount

of metal with a motorized grinding wheel, you need only remove a small amount of metal to create a sharpening bevel by hand.

The customary grinding angle for plane blades is about 25° . This allows for four to six re-sharpenings before re-grinding. You could use the same grinding angle for chisels, but I prefer about 18° because I use a lower sharpening angle than on a plane blade, and I like the more elegant look of the long grinding angle.

Bench grinders come in 6", 7", or 8" sizes running at around 1,120, 1,800, or 3,400 RPMs. Choose a slow-speed wheel. Also, consider that at a given RPM an 8" wheel cuts hotter than a 6" wheel because it travels more surface feet per minute. The type of wheel is



Successful grinding requires proper technique and equipment. This slow-speed grinder has been upgraded with a cool-running wheel, plus a tool rest and holder designed by the author.



Produce an accurate grinding bevel (without burning), by applying light pressure and a moderate feed speed — don't extend the bevel to a feather edge.



Grind chisels using exactly the same technique as you would with the plane blade. Note that chisels require a different tool holder.



Dress the wheel to remove glaze and to make it perfectly round and square across its face. A diamond-coated block dresser provides proper control.

oxide wheel coded 38A60-J8VBE. Although at 60x it may seem too coarse, remember the grinding marks left on the grinding bevel are removed when creating the sharpening bevel.

A cool-running wheel on a slow-speed grinder will help compensate for a range of grinding skills. It's up to you to control cut rate (how strongly you apply the blade to the wheel) and feed speed (how quickly you pass the blade across the wheel). Heavy pressure and slow feed cause rapid heating. No matter how light your touch, avoid grinding to a feather edge. You'll burn the blade because the heat has nowhere to go. Leave a strip of the sharpening bevel about $\frac{1}{16}$ " wide. With a properly dressed wheel, you should be able to re-grind a plane blade in two or three minutes.

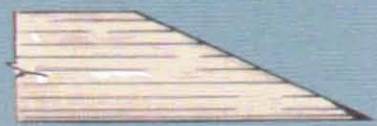
It is impossible to grind freehand, and the aids attached to most grinders are crude at best. I designed a simple tool holder and rest for plane blades and chisels. Complete building instructions and many other sharpening details are in my book *Sharpening With Waterstones*, available from Linden Publishing, 800-345-4447.

Over time, a grinding wheel begins to cut poorly and run hotter due to glazing. Remove the glaze with a wheel dresser. If you push the dresser firmly into the wheel, you will expose new, sharp abrasive grains and the wheel will cut fast and coarse. This is called "opening the wheel." If you touch the wheel very lightly, you will wear away the sharp edges of the abrasive grains and the wheel will cut slower and leave

Grinding Bevels



25° Grinding bevel on plane blade



18° Grinding bevel on chisel

critical to successful grinding. Discard the heat-producing, tool-destroying wheel that comes with the standard grinder and replace it with a cool-running wheel — one that combines minimal friction with good abrasion. An excellent choice is a Norton aluminum

a finer ground surface. Dressers are available as a silicon carbide stick, a diamond-coated block, or a single-point diamond. A block is much easier to use than a single-point.

Preparing the Sharpening Bevel

Bluntness is the rounding of the once-sharp edge. To make it sharp again, you restore a flat face to the sharpening bevel. Re-sharpening requires two grades of abrasive: the first is relatively coarse to quickly remove the rounded edge; the second is much finer to polish the new sharpening bevel created by the coarse abrasive.

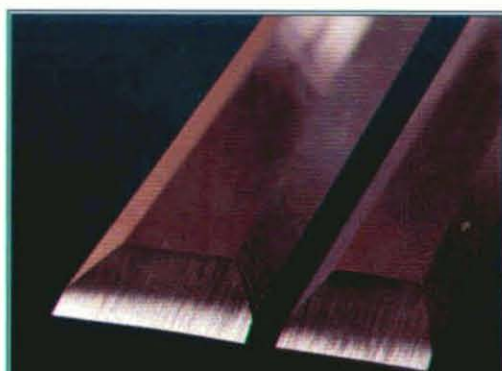
The removal of the rounded edge is indicated by a burr that is detected by touch. Aim for a very small burr. Raising a large burr increases sharpening time, wastes the grinding bevel, and shortens the blade.

To sharpen, you can hold the blade freehand or in a honing guide. The pros and cons of each method always stir debate. I sharpen freehand and have taught the skill to many woodworkers. Among its merits is speed. If you have a dedicated sharpening station and work with 4,000x and 8,000x waterstones, you can return a blade back to the job in less than a minute.

The main obstacle to accurate freehand sharpening is placing the abrasive on your workbench, which raises it too high by about eight inches. If you are 5'10" tall, the top of the stone should be about



Freehand sharpening on a waterstone is fast and effective. The speed is due to the pressure concentrated on the small surface of the sharpening bevel. Use a honing guide if you're concerned about gouging the stone.

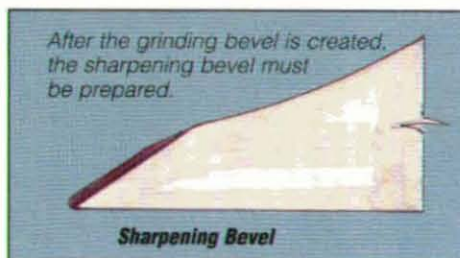


Diamond paste creates a superb polish on the back faces of blades. Although it could also be used to polish sharpening bevels, the procedure is time-consuming. Flattening and polishing blade backs is a one-time operation well worth the extra effort.

Reducing time spent sharpening is important because the operation is constantly repeated. 4,000x and 8,000x waterstones produce a fine sharpening bevel in a short time.

28 inches from the ground. Freehand sharpening is difficult to perfect unless the abrasive is at the proper height.

Another obstacle is infrequent practice. If you work full-time in a shop, freehand sharpening will quickly become second nature. If you work occasionally, sharpening will confront you each time as a skill that must be re-learned. Consider, however, that a honing guide has its own set of obstacles. It takes skill — and



time — to mount the blade so that you sharpen at the correct angle and across its full width. It takes even more skill to sharpen a plane blade, which must be slightly curved toward the center to prevent the corners from marking the board. Consider these points and go with the method that gives you the sharpest edge in the fastest time.

But no matter which method you choose, I would not become locked into it until you have at least given diamond paste a whirl. I am sure it will reflect well on you.

Ian Kirby, a master of the British Arts & Crafts tradition, is a woodworker, designer and wood scientist.

A Case for



By John Kelliher

Commendations

Cherry inlaid with brass and quartersawn oak I'd saved for a special project now frame an important family heirloom.

"What Medals? ..." I e-mailed back to my sister Mary. Soon, I was on the phone with my folks: Mom on one line, Dad on the other. I knew Dad was in World War II and that he was a radioman (he's still liable to use Morse code on the arm of his chair during a close football game). But he hardly ever talked about the war ... "I just wanted to get on with my life," he explained recently. After all these years, he decided it was time to find a more suitable place for a number of medals, photos and other memorabilia from his war days. I immediately volunteered to create this "more suitable place."

The design process started with my parents. First, they decided that a wall-hung cabinet with a glass door would be the perfect container for the items under consideration. My mom had just the spot for such a cabinet (which helped dictate the final size) and an idea of which species she'd like: "Cherry ... that's kind of reddish, right? That would be nice."

Sorting through all of the stuff my dad sent took the designing process to the next level — deciding how to lay out the inside of the box. The commendations seemed like such

humble documents — no foil stampings, no script, just a blue ribbon in an old manual typewriter, probably banged out somewhere on a beach. I was happy to see that some photos were included. While the medals were the reason for the case, my Dad's face in all of those situations made the medals and commendations seem more personal.

Detail Design

A few issues back, master woodworker Ian Kirby wrote about the design process (*Designing with Full-size Mock-ups*, October, 2000). There are, he pointed out, four important aspects to this process: functional design, spatial design, structural design and detail design. The first three aspects were pretty well covered already, but the "details" still eluded me. Kirby recommended creating full-size mock-ups at this stage, and I realized that, with a little help from my trusty computer, I could do the same thing. I used my flatbed scanner to scan all the items for

possible inclusion, created a document with a border (representing the back of the cabinet), imported the scans and slowly started moving them around until a design revealed itself. A commendation referring to "D" Day, July 10, 1943 took center stage, and the medals and photos found their spots from there. With a full-size pattern in hand and the approval of all, I was headed to the shop to start making sawdust.

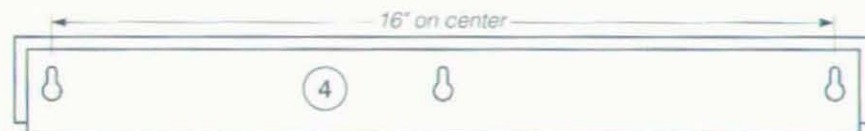
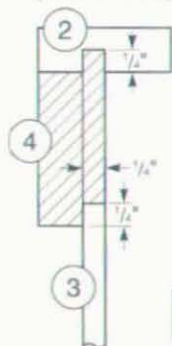
Building the Case

I made the case from beautiful straight grained cherry. Before I made any cuts, I selected the nicest looking wood for the most visible parts. The case sides, top and bottom (pieces 1 and 2), were

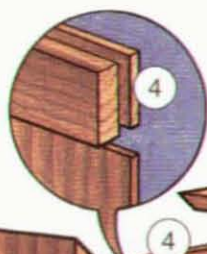
True to form, art director John Kelliher used a computer to assist in his case design. After employing a flatbed scanner to capture each medal and photo, he turned to familiar publishing software (Quark XPress®) to position the scans and dividers until he was happy with the layout. He then created a full-size pattern with our plotter (check with your local print shop) and had a few extra copies made — future gifts for his siblings.



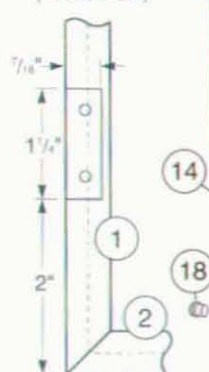
Hanger Strip
(Section view)



Hanger Strip
(Back view; keyhole locations)



Door Hinge Location
(Front view)



Catch Location
(Front view)

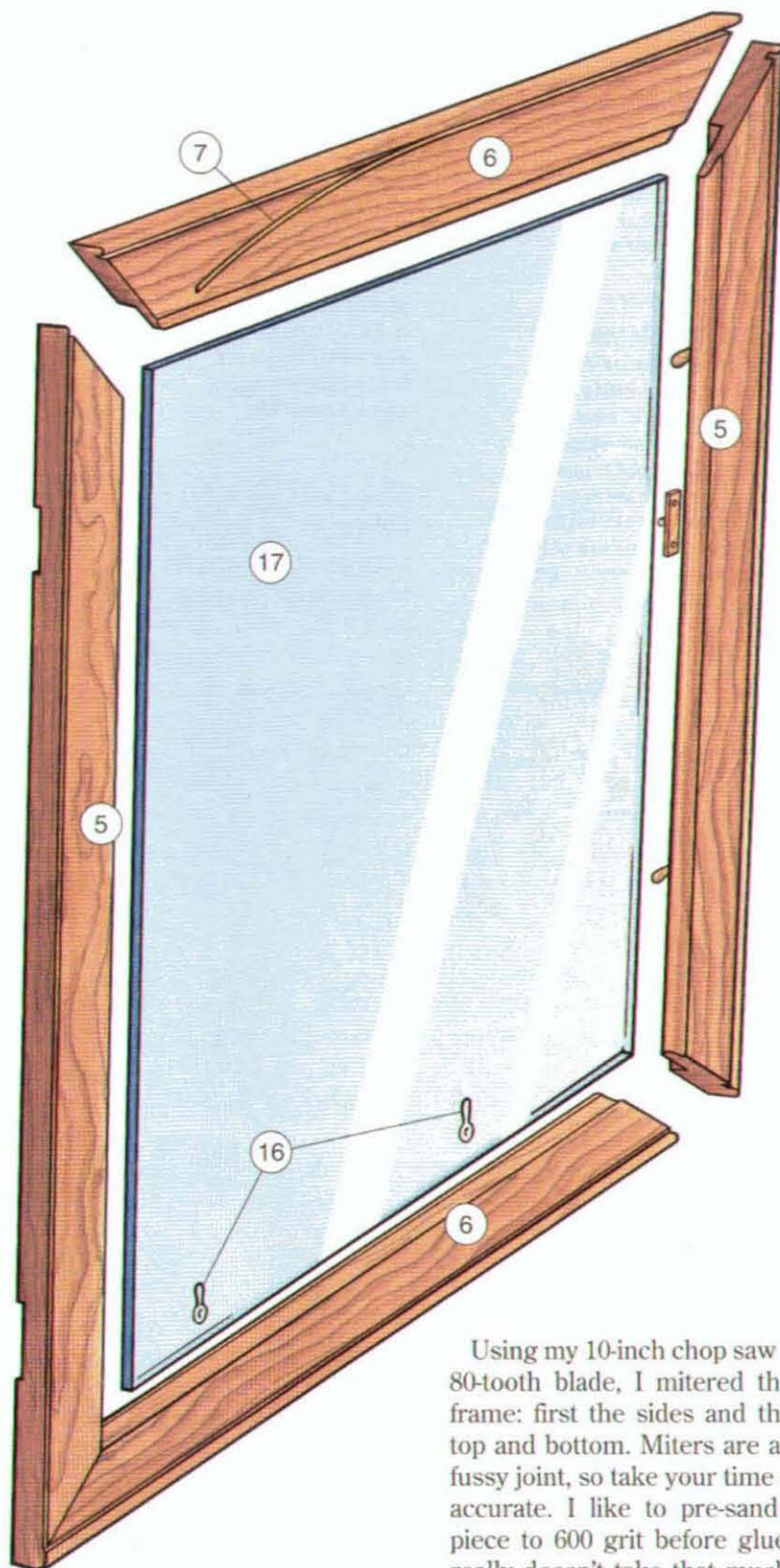


Photo Area
(Section view)

Exploded View

Material List

	T x W x L		T x W x L
1 Case Sides (2)	1/2" x 1 1/2" x 24"	10 Foam Core Backing (1)	1/4", Cut to fit
2 Case Top and Bottom (2)	1/2" x 1 1/2" x 18"	11 Photo Matting (1)	1/8", Cut to fit
3 Back (1)	1/4" x 21 3/4" x 17 1/2"	12 Small Frame Molding (1)	1/2", Cut to fit
4 Hanger Strip (1)	3/4" x 2" x 17 1/2"	13 Wedges (3)	1/2", Cut to fit
5 Door Sides (2)	1/2" x 2" x 24 1/8"	14 Hinges (2)	Brass
6 Door Top and Bottom (2)	1/2" x 2" x 18 1/8"	15 Door Catch (1)	Brass
7 Brass Inlay Strip (1)	1/16" x 90"	16 Brass Retainer Buttons (8)	Brass
8 Plywood Mounting Blocks (3)	3/8", Cut to fit	17 Glass Door Panel (1)	1/8", Cut to fit
9 Binning Strips	1/2", Cut to fit	18 Rubber Bumpers (2)	3/8" Diameter



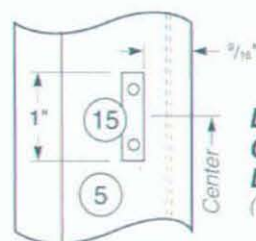
ripped to width and then a 1/4" groove was cut into them to receive the back and hanger strip (pieces 3 and 4). Remember that the sizes of the pieces in the *Materials List* will build a display case that fits my dad's stuff. Yours may need to be adjusted for your own treasures.

Using my 10-inch chop saw and an 80-tooth blade, I mitered the case frame: first the sides and then the top and bottom. Miters are a pretty fussy joint, so take your time and be accurate. I like to pre-sand every piece to 600 grit before glue-up. It really doesn't take that much time, and I find that cleanup and finishing are much easier with this approach.

Next, I cut the plywood back to size and selected a piece of solid cherry for the hanger strip. The hanger strip is rabbeted so it laps the plywood back and has 1/4" lips which extend into the grooves in



Door Frame: Full-size

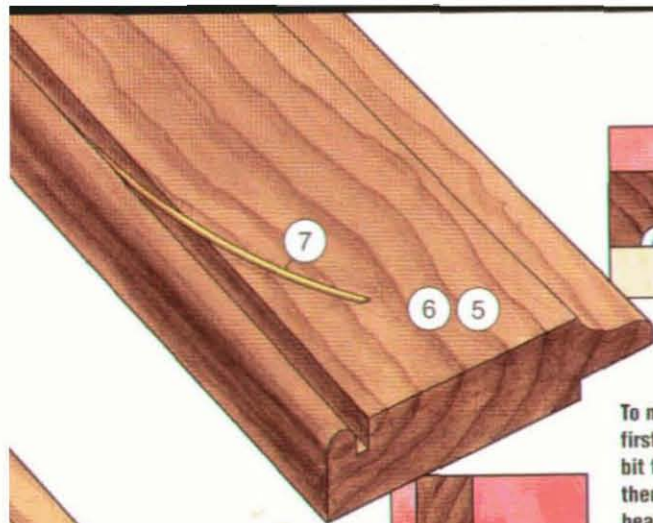


Door Catch Location
(Inside view)

the case pieces. (See *Elevation Drawings for details*). Once the piece is milled, take a moment to rout three keyhole slots (see *Drawing*). Next, I dry assembled all of the parts, and, when they fit perfectly, I was ready to glue and clamp them together. I like polyurethane glue for a project this size. I started with three small dabs of glue in one of the grooves, then added glue to one miter edge and wet the other with a damp sponge brush. I popped the back and hanger strip into the groove, then quickly did the same to the other side. With the sides glued to the back assembly, I placed the assembly into my framing clamp, with the corner brackets adjusted loosely enough so I could slip the top and bottom frame pieces in, their mitered ends covered with glue. After a little shifting around, I tightened the clamps' toggles and pulled it all together.

The Door Frame

The door frame needed to be just a bit bigger than the case, so it could be opened without a knob. As I mentioned earlier, the selection of attractive wood is the key to a nice looking display case. Again, I started by ripping a long piece of door frame stock to its proper width. Then I turned to the router table to form the edge details — and groove for the inlay — (see *Drawings*). I thought the brass would give just the right accent to the case. I mitered the stock to



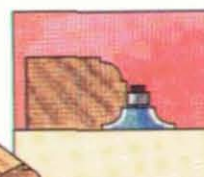
To make the door frame, first use your Roman ogee bit to soften the inside edge, then turn to a 1/8" edge beading bit to both shape the outer edge and create the groove for the brass inlay (left). Later, you can cut the rabbet on the table saw or router table.



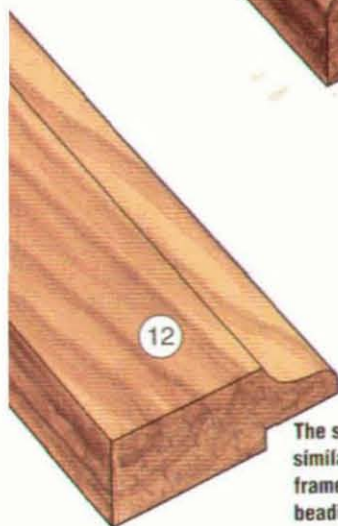
The Brass Inlay

I had heard that the thin accent brass strips (pieces 7) cut easily, but holding them would prove to be the real challenge. I made a little jig to use on my chop saw, but when I tried to make the cut ... "schwing," the blade's teeth caught the inlay and sucked it right out of my jig. Yikes! I had to go get another piece of inlay and figure out how to cut it. A nipper turned out to be the best answer. After practicing a couple of times on my slightly mangled scrap, I got pretty good at scribing a 45° line with a .05 mm mechanical

Form the binning strips by taking two passes with a beading bit and then cutting the rabbet with a straight bit.



Binning Strip:
Full-size



The small frame is similar to the case frame, without the beading detail.



Small Frame Molding:
Full-size

create the door sides, top and bottom (pieces 5 and 6). Gluing up this frame was simpler, but I used the same sequence as I did earlier with the case. After allowing the glue to dry, and removing the assemblies from their clamps, I cleaned up all of the surfaces, nooks and crannies.

Having recently read Michael Dresdner's article describing "chatoyance" (see *Finishing Thoughts*, June, 2000), I rubbed down all surfaces with linseed oil cut with turpentine. I let it dry for 24 hours and then hit it with an initial coat of lacquer. It would get at least two more coats, but I liked having all the surfaces sealed before attempting to glue the brass inlay in place, as this helps make cleanup a breeze.

pencil and my 6" try square, then nipping right on the line. A mitered portion of my scrapped jig allowed me to hit the brass a couple of times with a fine tooth file and perfect the miter. After cutting one end, I would lay the brass in the frame's groove; mark its proper length, plus a hair; nip; then file until the fit was perfect.

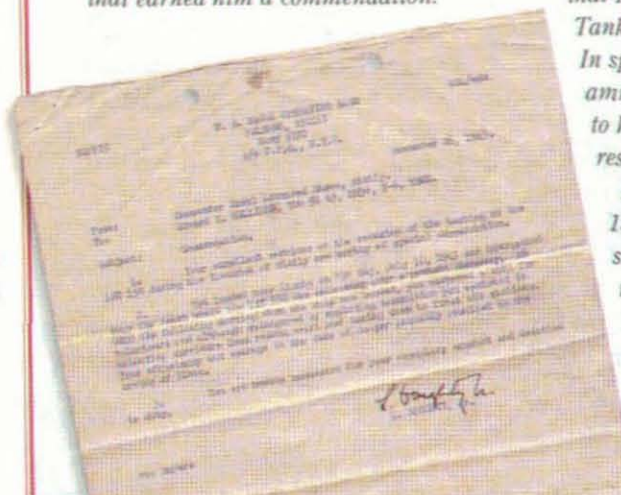
Since I was planning on applying a couple more coats of lacquer, I selected cyanoacrylate glue for installing the brass. It was easy, and there was virtually no cleanup to worry about. A quick swipe with some brass cleaner and just a little polishing with a soft cloth had the brass looking good to go. Starting in a corner, just a tiny drop every five to six inches did the trick. I used three

A Commendable Act ...

Right after completing my Dad's commendations case, I flew home for the occasion of my mom's 75th birthday party. While there I mounted his case on the wall, and that night my dad decided to share some war stories with the family — among them, the event that earned him a commendation.

Dad was a radio man on an LCI (Landing Craft, Infantry) during the invasion of Sicily. He had just come from the tail end of the invasion of North Africa. His craft had dropped their rangers on the beach when word arrived that LST 158 (a Landing Ship Tank) had been hit and was on fire. In spite of the risk of exploding ammunition, my Dad volunteered to help unload survivors from rescue crafts.

As his boat raced toward LST 158, a German submarine surfaced. "We exchanged machine gun fire," my Dad said, "but they must have thought we weren't worth a torpedo."



drops along the top, pressed in that section of inlay, and went with four drops along each side — holding the last drop back from the corner because the next piece starts there.

A Customized Interior

The interior of my father's case is designed specifically to fit the collection of memorabilia he brought home from WWII. It is not likely to be exactly what you might want to build, but the approach I used may be useful as you design your own case. I used two sizes of mounting blocks (pieces 8) for medals, binning strips (pieces 9) to create clear divisions and free floating foam core (piece 10) and photo matting (piece 11) to best show the old photos. I also milled and glued up a small frame



because after the machine gun exchange they submerged and took off. The seas were rough, and although some lives were saved, many others were lost.

"It was 'D' day," my Dad said, "so the Commander of Naval Advanced Bases was there. He sent his lieutenant down to get my name."

There was one other commendation that my dad had — for the invasion of Anzio. It was a lot more crinkled up and didn't really fit this case — so I left it in a plastic bag behind the medal mount panel. I have a feeling there are a lot of commendable acts that don't get framed appropriately. I'm glad I had the opportunity to frame my dad's.

— John Kelliher

Marking out and chopping the hinge mortises was a hand-powered operation.

The author's wheeled scribe and a sharp chisel made short work of the three-step process.

(piece 12) of golden hued white oak with a unique curly quartersawn grain to hold one of my dad's commendations. The wild grain made routing the molding's shape a little tricky, but it was well worth it for the look it created.

The entire contents of the case are held in place with a couple of different sizes of wedges (pieces 13) that run across the top of the case. This was a key design feature, since tightly holding the contents in place by friction allowed me to ship the case empty and put it all together at my parent's house. It also helped me create separate areas with the red, white and blue fields complementing the medals.

I folded red and blue velvet around the three medal mounting blocks and pinned it, and then my wife, Liz, sewed it up in the back. It was nice the way the smoothly finished wooden pieces and the velvet covered blocks fit together — but it took me a couple of attempts cutting the plywood, wrapping and pinning the velvet on it, and fitting the frame with the two medal mounts, before it was perfect.

Last Details

When I went to form the mortises (see *Drawings*) for the hinges (pieces 14) and catch (piece 15), I ran into my first small challenge (every project has at least one). I had to cut some of the hinge screws down in length, as they were lining up right behind the groove with the brass strip.

I used brass retainers (pieces



16) to hold the panel in place, which meant I could ship the case without glass (piece 17). The final coats of lacquer were applied, and I was ready to send it home.

Two weeks later, when I arrived home for my mom's 75th birthday party, it was easy to have the glass cut locally and equally easy to install it. I hung the case in its predesignated spot and settled in to hear the stories behind some of those medals and pictures.

John Kelliher is the art director for Woodworker's Journal. This is his first article, but you've been enjoying his drawings for many years.



Cherry China Cabinet

By Rick White

Inspired by readers' requests, this china cabinet features classic clean lines, gentle arches and hidden hardware.

Of all the readers' requests we've received over the years for furniture plans, the perennial leader has been a china cabinet. With that in mind, the design team at *Woodworker's Journal* developed this beautiful project that, with care and patience, is well within the abilities of any intermediate to advanced hobbyist. It calls for full 1" thick solid cherry boards and 1/2" and 3/4" cherry veneered plywood, all of which you should source before heading for the shop.

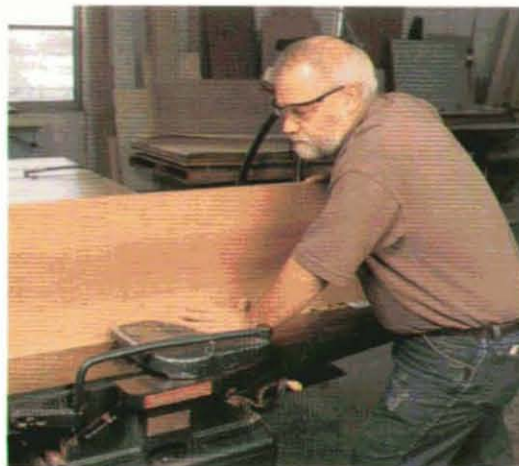
The cabinet is made up of two very distinct parts. The base houses five sliding shelves behind a pair of veneered doors. The upper section was designed to proudly display family treasures on its glass shelves, keeping them dust-free behind a pair of large glass doors.

Building from the Bottom Up

For the best effect, the upper and lower units of this cabinet should flow together visually. The way to achieve this is to run continuous grain all the way up the side panels. So, the first step in construction is to edge glue enough hardwood to make these two panels, each large enough to yield both a lower and an upper side. Make each side blank 1" x 17 1/2" x 86", and you'll have sufficient material for all the side pieces.

After the glue dries, sand the panels and begin your machining by cutting the base sides (pieces 1) to size. Then refer to the *Drawings* on page 44 to lay out the leg cutouts. Apply masking tape where the cut lines will be, to reduce tearout. On the tape, mark the locations of the two legs in each side, then cut away the waste with a saber saw.

There is a horizontal divider (piece 2) above the bottom shelf (piece 3) in the base cabinet, and the next step is to rout stopped dados for them (using a straightedge as a guide) in each base side. The divider is cut from nominal 3/4" thick stock: you may find it's actually a hair shy of that. Plow the dados for the



Joining a dead straight edge on the 1" thick glued-up side blanks is the first step in accurately machining the carcass.

horizontal divider and the cabinet bottom and square up their ends with a sharp chisel. Both dado locations are shown on the *Drawings*. Next, with your straight-edge clamped in place, plow a 3/4" wide by 3/8" deep dado across the top face of the horizontal divider — running from the front to back — to receive the vertical divider.

Dividers, Stringers and Feet

With the base sides completed, the next step is to lay out the vertical divider (piece 4) and notch its back corner. Cut the back and front feet (pieces 5) to size and shape next, and give them a thorough sanding without softening their edges. The front stringer (piece 6) is solid hardwood: lay out a gentle arc along its

A complementary piece of furniture, the cherry dining table, was first offered in *Today's Woodworker*, October 1992.



bottom edge by bending a piece of hardboard or 1/4" plywood along the arc, clamping it in place and drawing the line. Cut the arc on the band saw, then sand it thoroughly. A large drum sander in the drill press works best for this, or you can use part of the cutoff to make an arched sanding block. The back stringer (also piece 6) has no arc since it's not visible. Trim the front edges of the dividers with 1/4" hardwood (piece 7) before you begin assembly.

Attach the feet to the stringers with biscuits, glue and clamps, then sand them thoroughly after the glue has cured. I used two different size biscuits on this project. If your biscuit joiner won't accommodate the small biscuits, substitute dowels or pocket hole joints instead.

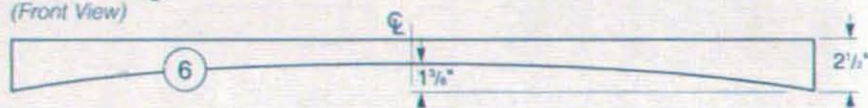
Move to your router table and cut the rabbets (see the *Drawings*) on the inside edges of the bottom stringer and foot subassemblies. Your next preparation step is to make a frame which nestles inside the upper perimeter of the lower cabinet. Cut the top stringers and supports (pieces 8 and 9) and join them at the corners, using a pocket hole jig, to create a rectangular frame. On the drill press, predrill and countersink elongated holes in the top supports for the screws that will hold the top in place. Bore countersunk holes across the bottom edge of the back top stringer ... these screw holes will also be used to secure the top.

Assemble the Base

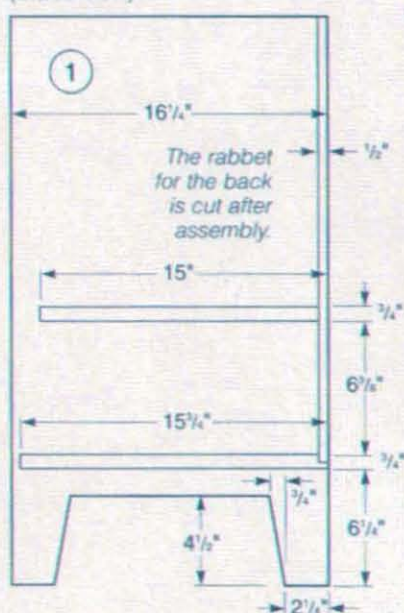
Now you're ready to assemble the base. It's a good idea to have some help for this. Begin by notching the trim and gluing the vertical divider into its dado in the horizontal divider. (It's easier to do this now than later, after the base is assembled.) Next, cut the biscuit slots into the side and feet as seen in the *Exploded View*.

After the glue sets, dry fit the base together. When everything works,

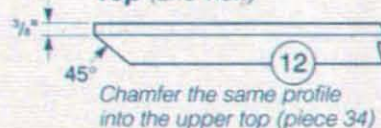
Front Stringer
(Front View)



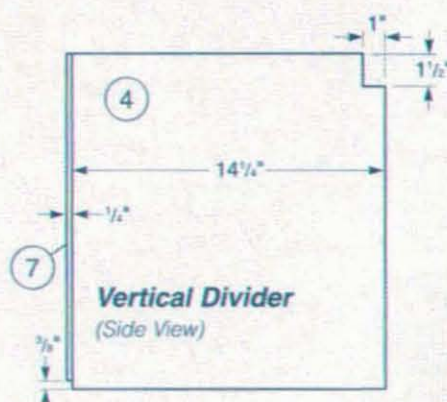
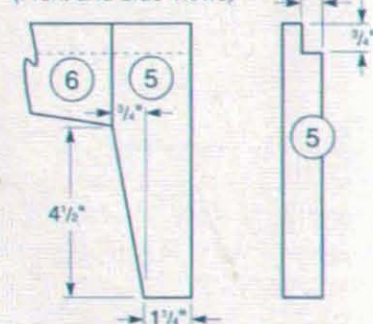
Base Side
(Inside View)



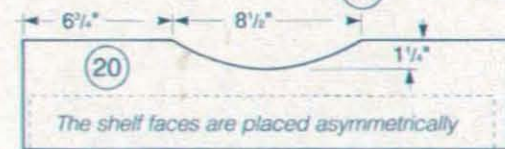
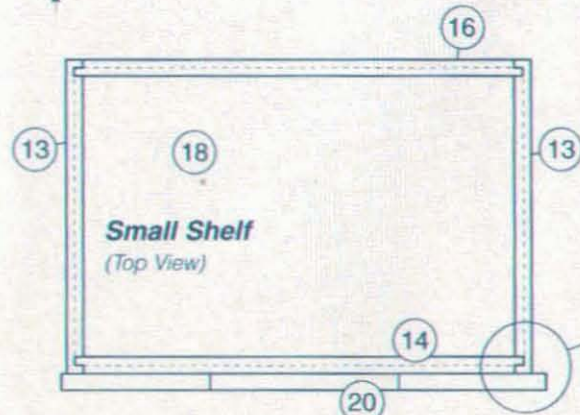
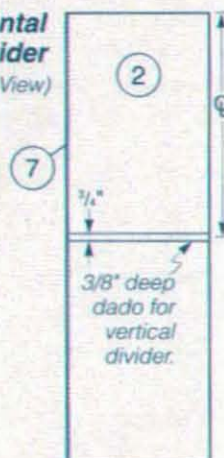
Top (End View)



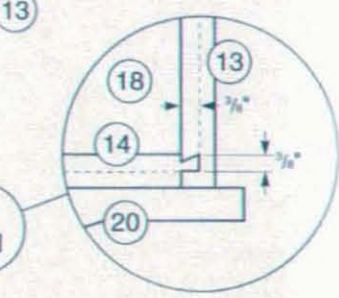
Feet
(Front and Side Views)



Horizontal Divider
(Top View)

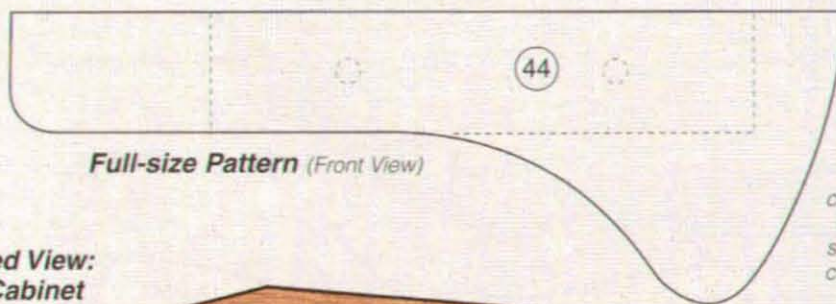


Small Shelf (Front View)



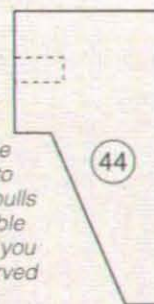
Small Shelf (Side View)

Pull



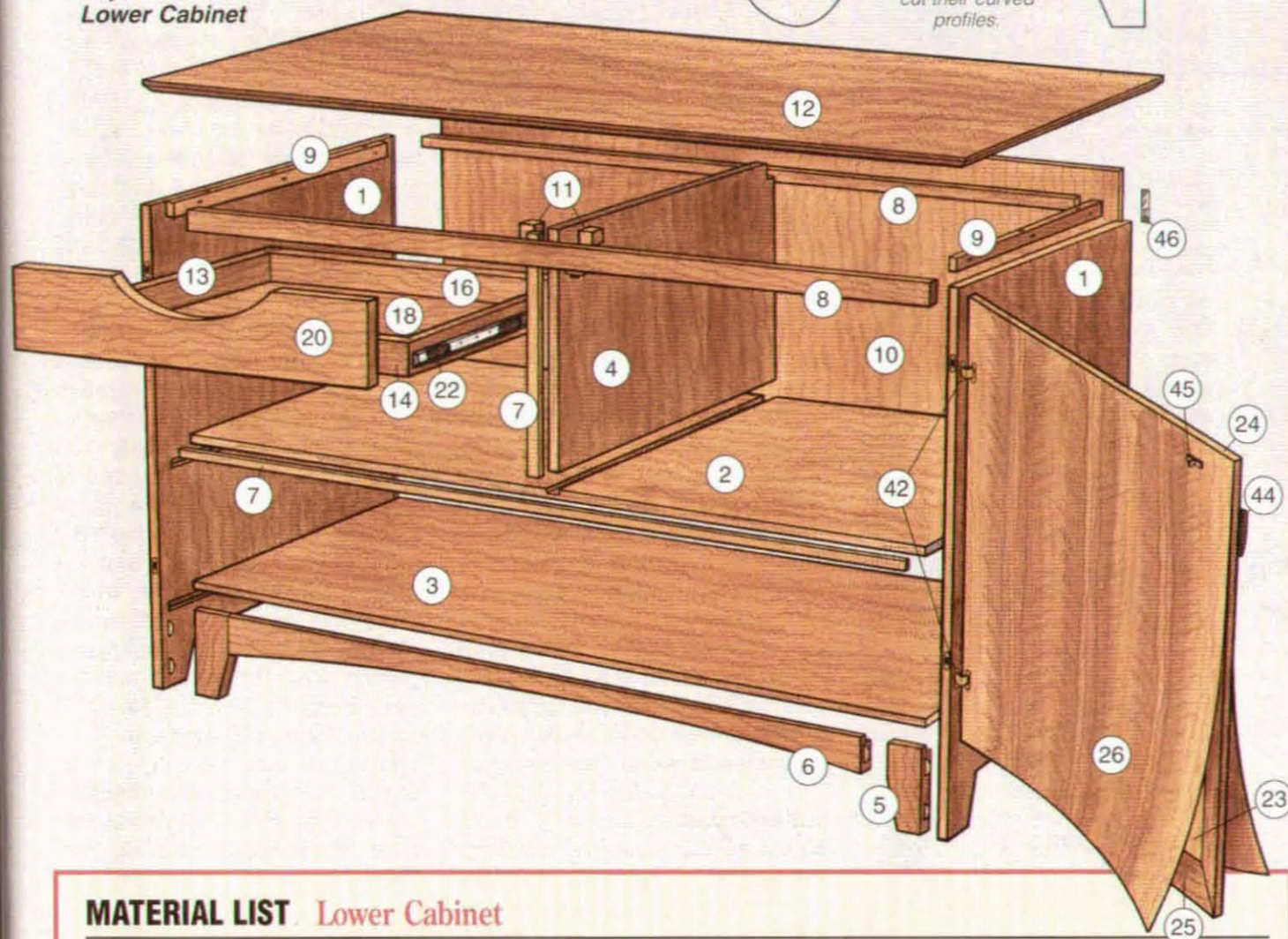
Full-size Pattern (Front View)

Molding
Full-size
(Front View)



Shape the
molding to
create the pulls
on your table
saw before you
cut their curved
profiles.

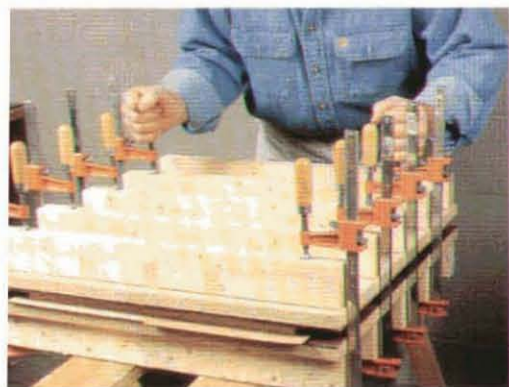
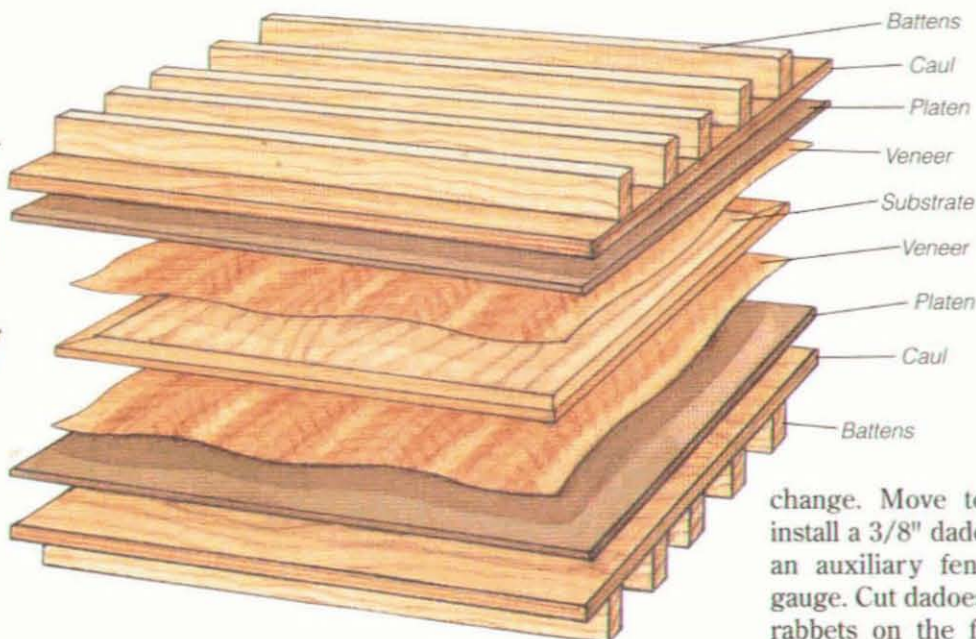
Exploded View:
Lower Cabinet



MATERIAL LIST Lower Cabinet

	T x W x L		T x W x L
1 Base Sides (2)	1" x 16 1/4" x 29"	14 Small Shelf Fronts (4)	3/4" x 2 1/2" x 20 3/8"
2 Horizontal Divider (1)	3/4" x 14 1/4" x 46"	15 Large Shelf Front (1)	3/4" x 2 1/2" x 43 1/4"
3 Bottom (1)	3/4" x 15 1/4" x 46"	16 Small Shelf Backs (4)	3/4" x 2 1/2" x 20 3/8"
4 Vertical Divider (1)	3/4" x 14 1/4" x 15 1/4"	17 Large Shelf Back (1)	3/4" x 2 1/2" x 43 1/4"
5 Feet (4)	1" x 2" x 7"	18 Small Shelf Bottoms (4)	1/4" x 13 1/2" x 20 3/8"
6 Front and Back Stringers (2)	1" x 2 1/2" x 41"	19 Large Shelf Bottom (1)	1/4" x 13 1/2" x 43 1/4"
7 Divider Trim (1)	1/4" x 3/4" x 62"	20 Small Shelf Faces (4)	3/4" x 5 3/4" x 22 3/8"
8 Top Stringers (2)	1" x 1 1/2" x 45"	21 Large Shelf Face (1)	3/4" x 5 3/4" x 44 7/8"
9 Top Supports (2)	1" x 1 1/2" x 13 3/4"	22 Drawer Slides (5 Pairs)	Full extension
10 Back (1)	1/2" x 46" x 22"	23 Base Door Panels (2)	3/4" x 21 1/2" x 22"
11 Glue Blocks (2)	1" x 1 1/2" x 1 1/2"	24 Door Side and Top Trim (1)	3/4" x 1" x 150"
12 Top (1)	1" x 19 1/8" x 51"	25 Door Bottom Trim (2)	3/4" x 2 1/2" x 22"
13 Sliding Shelf Sides (10)	3/4" x 2 1/2" x 14 1/4"	26 Veneer (4)	1/32" x 24" x 27"

Veneer the doors in a shop-made veneer press. The waxed platens resist glue and the clamping cauls and battens transfer pressure to the glue-up. You can gently crown the battens or just glue a small section of veneer at the center of each batten.



glue and clamp the leg subassemblies to the sides, along with the bottom and horizontal divider. Drop the top stringer and support subassembly in from the top. Make sure the assembly is square as you tighten the clamps. Drive screws through the top supports into the base sides.

After the glue dries, use a rabbeting bit to reveal the 1/2" x 1/2" deep rabbet for the base back (piece 10). Square the corners of the rabbet with a chisel, then use a pencil to mark the location of the horizontal divider's dado on the back edge of each cabinet side. Install the back with 1" panel nails, using your pencil marks to locate the centerline of the horizontal divider. Two glue blocks (pieces 11) are now snugged and glued into place where the vertical divider meets the front top stringer.

The Base Top

I decided to go with an edge-glued solid hardwood top (piece 12) because I think it increases the quality of the piece. Have a local cabinet shop run the top through their wide belt sander before you trim it to size: they won't charge much and you'll get very uniform results. Use your table saw to form the 45° chamfers on the bottom edge, along the front and both ends, then sand the top. Install the top by driving screws up through the top supports and the top back stringer.

Sliding Shelves

All five sliding shelves are built in a similar fashion: only the dimensions

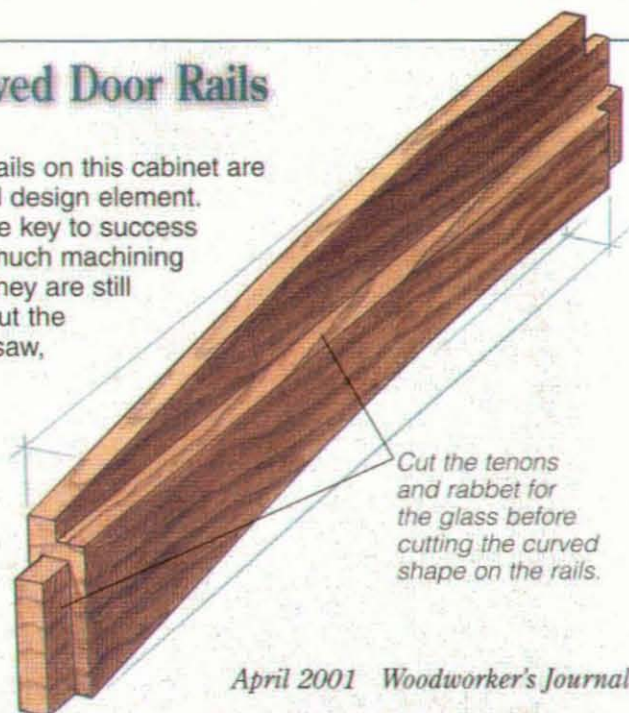
change. Move to the table saw, install a 3/8" dado head and attach an auxiliary fence to the miter gauge. Cut dados on the sides and rabbets on the fronts and backs. Note: the 3/8" locking joint uses the same setup to mill both the dados and the rabbets on the shelf sides and fronts (pieces 13 through 17). All these dimensions can be found on the *Drawings* on page 44.

Reconfigure your dado head to form 1/2" wide by 3/8" deep cuts for the bottoms and plow the grooves for the shelf bottoms (pieces 18 and 19) in the fronts, sides and back. Assemble the shelves, gluing and clamping the corners while letting the bottoms float freely in their grooves to account for wood movement.

Trim the shelf faces (pieces 20 and 21) to size, double-checking these measurements with a dry fit in the assembled base cabinet. Following the layout on page 44,

Cutting Curved Door Rails

The curved door rails on this cabinet are an important visual design element. With these rails, the key to success is to complete as much machining as possible while they are still rectangular, then cut the curves on a band saw, as shown at right. Remember, once they are curved, they are left and right and upper and lower rails.



band saw the arc-shaped handle openings and drum sand the saw marks smooth.

Install the drawer slides (pieces 22) and the shelves according to the slide manufacturer's instructions (see *Techniques*, page 64). With the shelves installed, locate the faces so there is a 1/8" gap between the pairs of small ones and screw all five in place from the back through predrilled, countersunk holes.

The Base Doors

The base doors are plywood panels (pieces 23) with hardwood trim (pieces 24 and 25) baked into their top and side edges with glue and clamps. Sand the doors after the glue dries, then veneer both the front and back faces with cherry veneer (pieces 26). This is essential to achieve balance and avoid warping. Use a shop-built veneer press like the one shown at left.

After the glue has cured, lay the doors on their openings and scribe the arcs onto their bottom edges. Cut the curves on your band saw, then sand all the edges gently and set the doors aside.

The Upper Carcass

Remember those two large boards you glued up for the sides? Make sure to trim the correct edge of each

to make the upper sides (pieces 27), so that the grain pattern is carried through from the base. After they're trimmed, you use a straightedge and a dovetail bit chucked in your router to plow four sliding dovetails across the inside face of each (see the *Drawings* on page 48 for locations and the sidebar at right for details). Note that these are stopped dovetails.

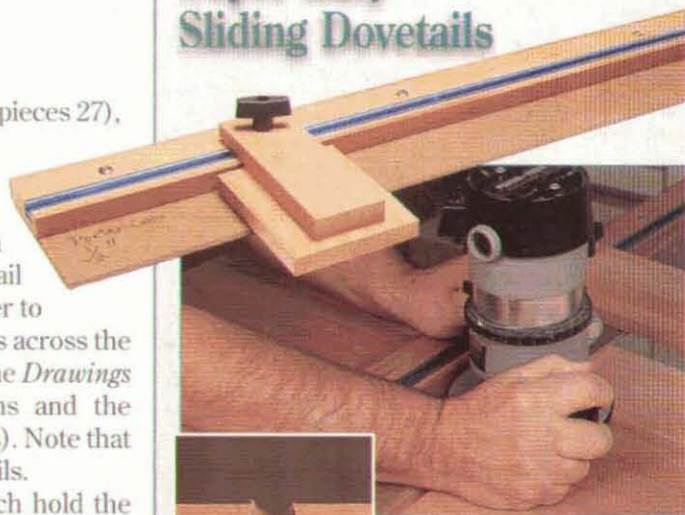
The three shelves which hold the glass in the upper cabinet are very simple frame construction. Cut tenons on the ends of the six shelf ends (pieces 28), using your table saw's miter gauge and a dado head. Use a 1/4" bit in your router table to create an open saddle mortise on the end of each shelf rail (pieces 29) and square up the mortise (see the *Drawings*).

Assemble the shelves with glue and clamps. Machine their long dovetailed shape on the ends (see sidebar at right) and cut them back to match the stopped dovetail slots in the sides. Use a bearing-guided rabbeting bit to create the lip for the glass inserts (pieces 30), squaring up the corners with a sharp chisel.

Cut the cabinet bottom (piece 31) to size from solid hardwood, then form the dovetailed ends as you did with the shelves. Band saw the arc on the bottom edge of the lower stringer (piece 32) and front upper stringer (piece 33). Sand out the saw marks.

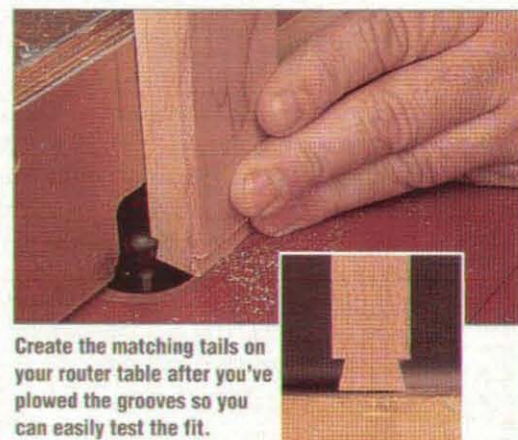
Dry fit the shelves and the cabinet bottom to the upper sides. Cut biscuit slots to attach the stringers to the cabinet sides (with the curved ones to the front). When you're satisfied with the fit, disassemble the upper cabinet, sand all parts thoroughly, and then reassemble it with glue and clamps. Again, with a project of this size, don't hesitate to have a buddy give you a hand with the assembly and glue-up.

Super Easy Sliding Dovetails

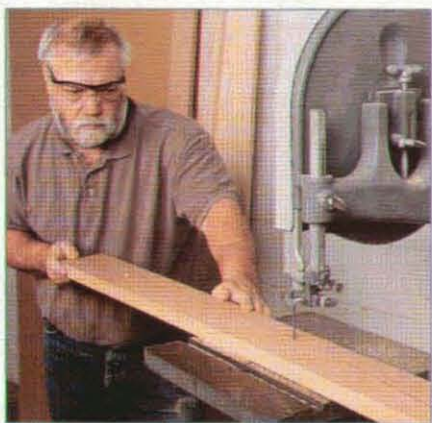


Plow sliding dovetail grooves with a router and clamped on straightedge.

Sliding dovetails are really just an upscale version of dados. The main advantage to the sliding dovetail is that it is a truly mechanical joint – its shape will not allow the joint to pull apart. Plow the dovetail as you would a dado, with a router and a straightedge. I used one of my favorite jigs (see *Woodworker's Journal*, June 2000), because it has a built-in adjustable stop. It may be apparent, but it's important to note that you can't stop your router as you plow the dovetail: you must cut it in one pass with the dovetail bit. (Its shape makes this essential.) It is a good idea to remove some material first with a straight bit and follow behind with the dovetail cutter. When you're done plowing the dovetail grooves, chuck the same bit into your router table and create the shoulders (tails) of the joint, one side at a time.



Create the matching tails on your router table after you've plowed the grooves so you can easily test the fit.



Band saw the matching curved rails. Rick found that the lion's share of machining should be completed prior to this step.

The Upper Top and Back

The upper top (piece 34) is another edge-glued solid hardwood board like the top of the base cabinet. Cut it to size and form the 45° chamfer on the bottom lip of its front and side edges. To install it, predrill slightly oversized holes and countersink for screws that are driven down through the top into the sides and the upper stringers.

Follow the same procedure used earlier to create the rabbet for the upper back (piece 35), then chisel out the corners and nail the back in place.

Machine the Upper Doors

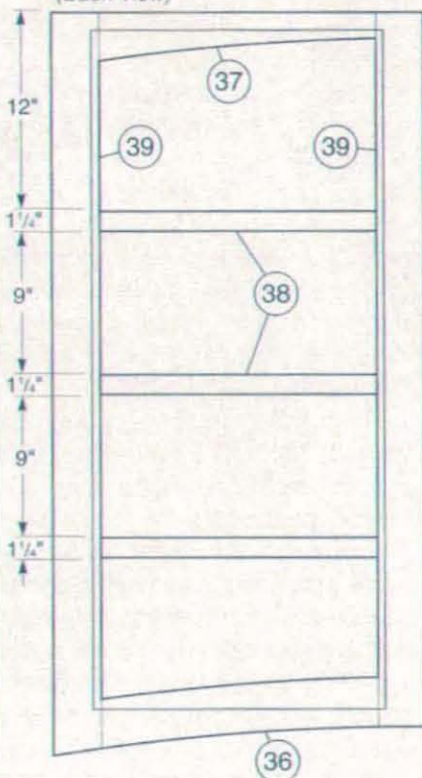
These doors are really what sets this china cabinet apart. They simultaneously enclose and protect the treasures within while offering them for display. The door style continues the gracious arcs used throughout the project and, while they look difficult to build, they really aren't.

With the parts already cut to the rectangular dimensions given in the *Material List*, begin construction by setting up a dado head in your table saw. Use it and the miter gauge to create tenons on the ends of all four door rails (pieces 36 and 37) and the six small muntins (pieces 38). Dimensions for these are given in the *Drawings*. On the rails, you have to cut the large rabbets before you cut their curved aspects. Now lay out the shape of the door rails and, using a band saw, (see the sidebar on the previous page) create their gracious arcs. Sand them smooth.

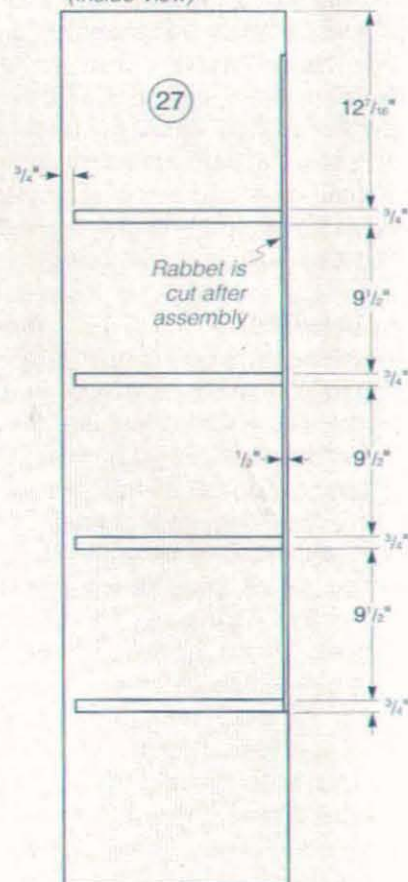
Again referring to the *Drawings*, lay out the five mortises in each door stile (piece 39). If you do not have access to a dedicated mortising machine, use a Forstner bit in drill press to remove most of the waste in these mortises, and finish up with a sharp chisel.

Upper Door
(Back View)

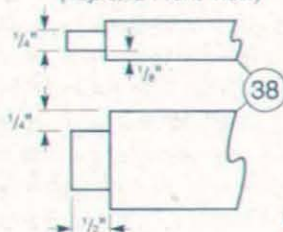
The upper doors are hung 1/2" below the bottom edge of the cabinet's top.



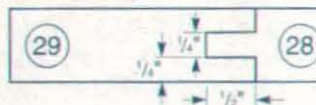
Upper Side
(Inside View)



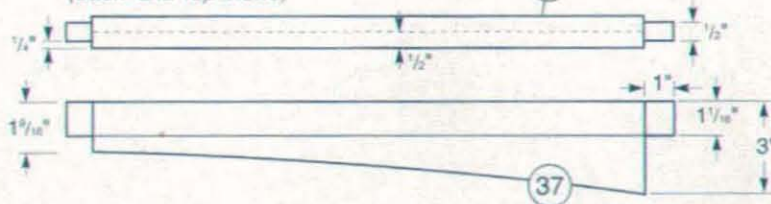
Muntin
(Top and Front View)



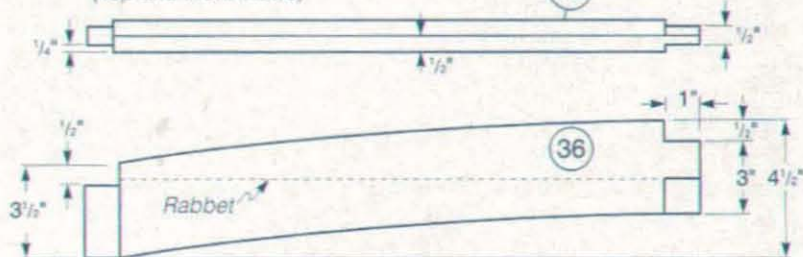
Shelf Joinery Detail
(Side View)



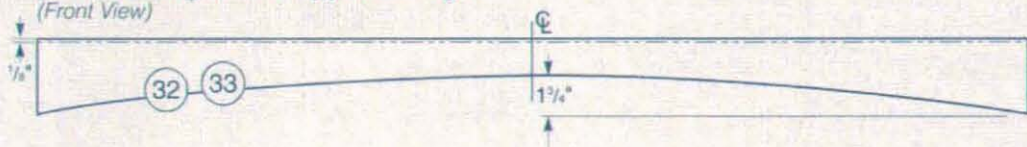
Upper Door Rail
(Back and Top Views)



Lower Door Rail
(Top and Front Views)

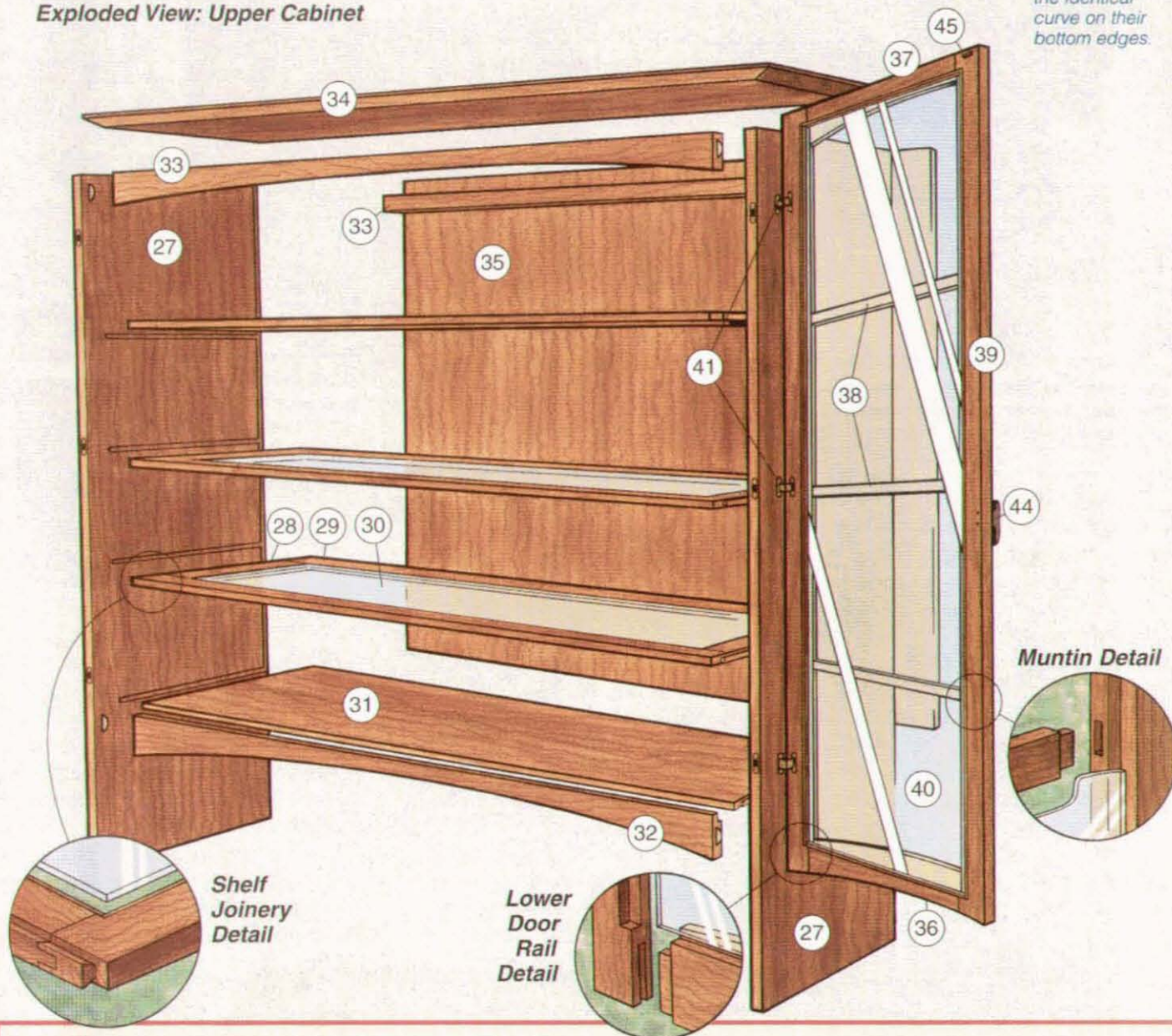


Lower Stringer and Upper Stringer (Front View)



NOTE: The lower and upper stringers are 1/8" different in width, but have the identical curve on their bottom edges.

Exploded View: Upper Cabinet



MATERIAL LIST Upper Cabinet

	T x W x L
27 Upper Sides (2)	1" x 14" x 55"
28 Shelf Ends (6)	3/4" x 2 1/2" x 9 1/4"
29 Shelf Rails (6)	3/4" x 2 1/2" x 46"
30 Shelf Glass (3)	1/4", Cut to fit
31 Cabinet Bottom (1)	3/4" x 13 3/16" x 46"
32 Lower Stringer (1)	1" x 3 1/8" x 45"
33 Upper Stringers (2)	1" x 3 1/4" x 45"
34 Upper Top (1)	1" x 17 1/8" x 51"
35 Upper Back (1)	1/2" x 45 3/4" x 47 1/2"
36 Lower Door Rails (2)	1" x 4 1/2" x 19 1/2"

	T x W x L
37 Upper Door Rails (2)	1" x 3" x 19 1/2"
38 Muntins (6)	1/2" x 1 1/4" x 18 1/2"
39 Door Stiles (4)	1" x 3" x 46 1/8"
40 Door Glass (2)	1/4", Cut to fit
41 Upper Door Hinges (3 pairs)	2 1/2" Brass
42 Lower Door Hinges (2 pairs)	1 3/4" Brass
43 Glass Retainers (1)	1/4" x 1/4" x 240"
44 Door Pulls (4)	3/4" x 1 1/2" x 4 1/4"
45 Door Catches (4)	Brass ball type
46 Anchor Strips (2)	1/8" x 3/4" x 3"

Installing Soss Hidden Hinges

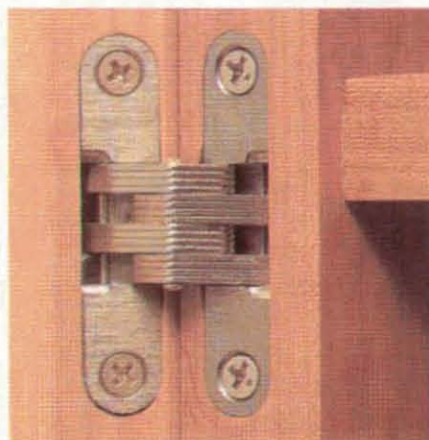


The unique construction of Soss hinges means you'll have to rout a two-step mortise.



Use a shop-made or commercially available jig to create the mortise for the Soss hinges. This china cabinet required two different sizes.

Finding hidden hinges sturdy enough to hang these large heavy doors was a challenge. The answer turned out to be Soss hinges – which are elegant to look at and very strong. I used a larger model on the upper cabinet doors than on the lower cabinet. They are undeniably tricky to install, but well worth the effort. This style of hinge fits into a two-level mortise which is best created with a router and a jig. As with any tricky operation, practice your cuts in scrap lumber before you move to your project.



Tight-fitting and extremely strong, Soss hinges were the best solution to our design challenge.

Ebony Pulls

Glue and clamp each door together, making sure they are absolutely flat and square. After the glue dries, sand each door.

Completing the rabbet in the back of each door stile for the door glass (piece 40) takes a little thought. Use a straightedge and a 1/2" diameter straight bit for this operation. You'll need to stop the rabbet short and square your corners with a chisel.

Install the doors

To maintain the clean lines of this project, I chose hinges (pieces 41 and 42) that are invisible when the doors are closed. Follow the manufacturer's instructions to create the two-level mortises (see sidebar at left) for these hinges, then dry fit the doors. Be aware that the hinges are NOT adjustable, so you need to place them correctly the first time.

Do a final sanding of all parts, then apply three coats of clear satin finish, sanding between coats with 400 grit wet/dry paper. Don't forget to finish all four sides of the glass retainer strips for the upper doors (pieces 43). After the finish dries, install the glass. This **MUST** be safety glass: anything else presents a real physical danger to your family. Also, never order your glass until you have your doors built. Miter the retainer strips to fit and secure them with 1/2" pins. Predrill the strips to avoid splitting.

Ebony Door Pulls

I made the door pulls (pieces 44) from solid ebony. This cabinet will last generations and deserved the best. You'll also notice that when the cabinet is closed up, there is no hardware visible ... just wood.

The pulls start out as a piece of molding (see the *Drawings* for the profile) and then are cut and sanded to their final shape. Cross cut them



For the solid ebony pulls, first create a molding as shown in the *Drawings*. Complete the pulls' organic shape on the band saw and disk sander.

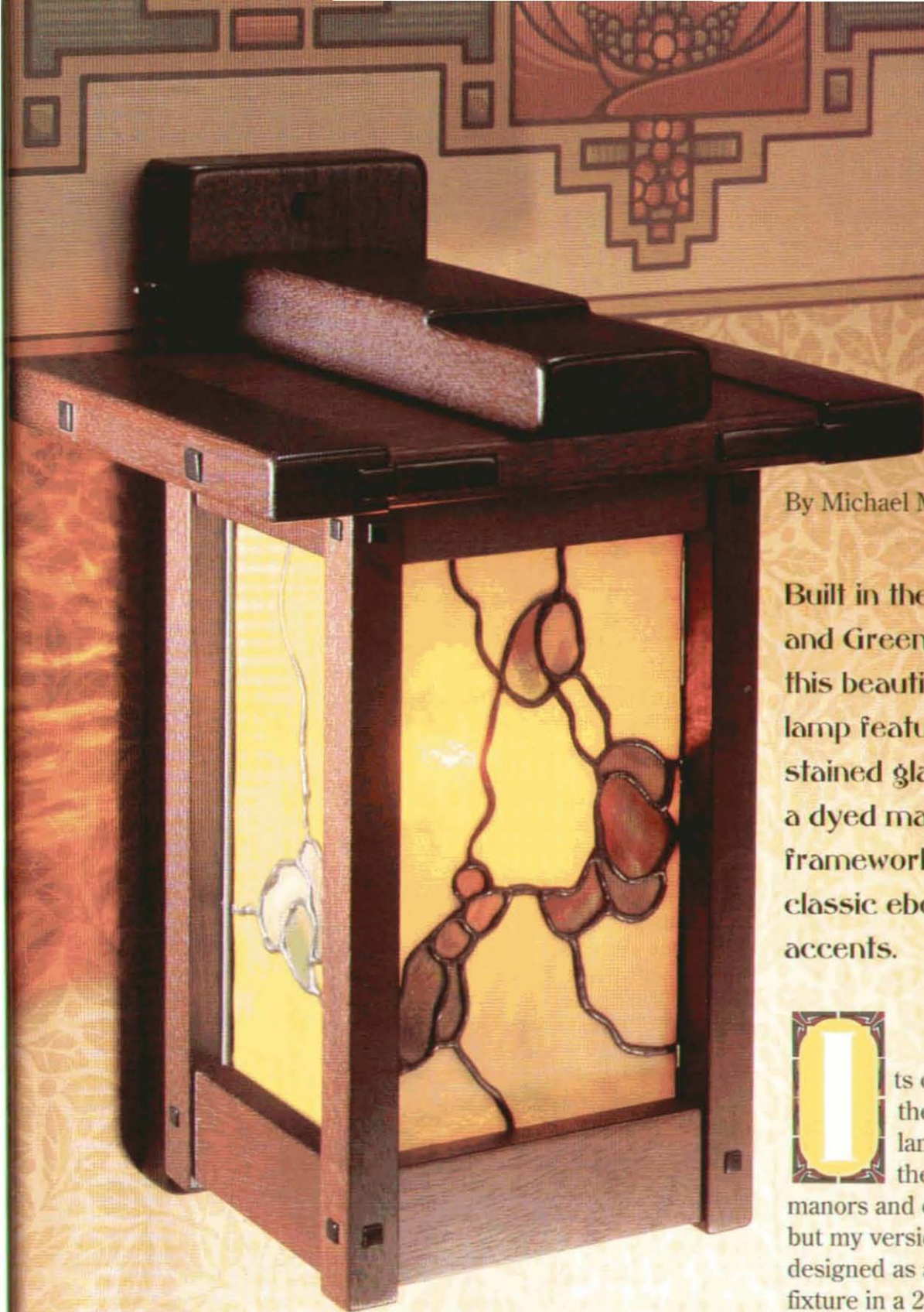


to length and notch out their back to raise the mounting area of the pulls. Use a band saw and a disk sander to complete the shape. Polish them to 600 grit and apply a good coat of oil for their finish. Wrap up by installing the brass door catches (pieces 45), as shown on the *Exploded View*.

The last step is to cut a piece of 1/8" thick 3/4" metal bar stock to create the anchor strips (pieces 46). Counterbore four holes and use the anchors to secure the top and bottom units together. This is an important step as it prohibits the top from toppling over onto a person who is using it.

With the final details completed, it's now time to move the cabinet to your dining room and load it up with the good china. Let's just hope your work doesn't put the china to shame!

Contributing editor Rick White is a master woodworker who is most comfortable in his shop or in a boat chasing walleyes.



By Michael McGlynn

Built in the Greene and Greene tradition, this beautiful wall lamp features stained glass panels, a dyed mahogany framework and classic ebony accents.



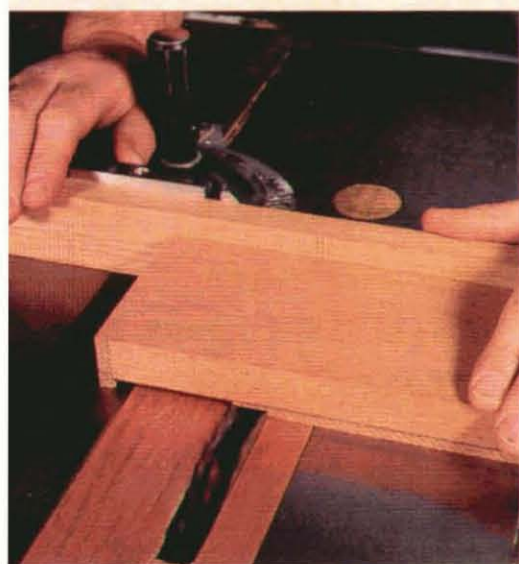
Its origins lie in the ornate oil lamps that graced the walls of manors and elegant homes, but my version was designed as an electrical fixture in a 21st century home — effectively demonstrating the transition of the Arts & Crafts movement itself, which connected two centuries, rural crafts and high technology.

Arts & Crafts Wall Lamp

Endcaps, Splines and Top Subassembly Detail (Top and Side View)

Wall Bracket Plate

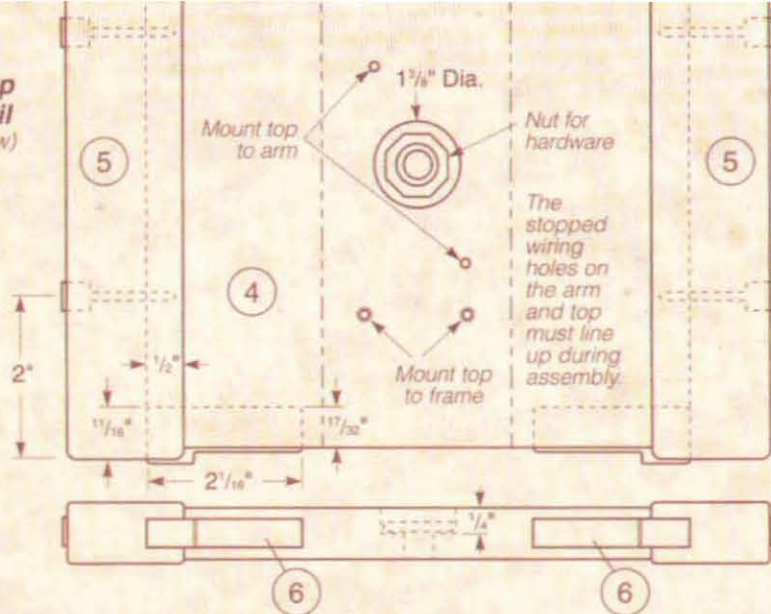
The wall lamp is mounted using a simple, L-shaped wooden bracket, and this is the first subassembly you need to make. Rip and cross cut the wall plate (piece 1) to the dimensions shown in the *Materials List* at right. Note that these dimensions are 1/4" longer than the final dimensions of the plate. That excess will allow you to remove material from the front face, creating a stepped effect.



Expose 3/16" of the dado head cutter, then relieve the front face of the plate, leaving a stub at the end to keep your cut true.

To create that look, install a dado head in your table saw and make sure your miter gauge is truly set to 90°. Make repetitive cuts (as shown in the photo above), saving the last 1/4" at the bottom to keep the piece level as you work. Mill the entire dado, then turn the piece over, install a standard crosscut blade and remove the bottom 1/4".

Use a Forstner bit to drill two 1" diameter holes in the back of the plate, one stopped and the other all the way through (see the *Elevation Drawings* at right for details), then chuck a 3/4" straight bit in your router to plow a groove between these holes (make several passes).



Next, lay out and chop the two 3/8" square mortises in the plate for the mounting screws (refer to the *Drawings*).

The last milling operation is to drill a through hole for the electric ON/OFF switch and the cord. Have your switch in hand before you size this hole, and drill it at the location shown on the *Drawings*.

Wall Bracket Arm and Assembly

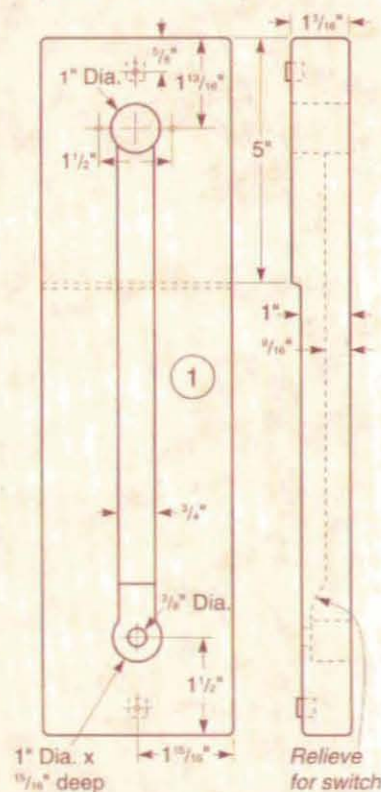
The arm for the bracket (piece 2) is cut from stock the same thickness as the plate. It, too, is stepped, so return to the dado head for your first milling operation. As the lower step is less than half the length of the arm, there is no need to leave a stub on the end this time around. Simply nibble away the waste, using your miter gauge as a guide.

The thick end of the arm is attached to the plate with two screws (pieces 3). Refer to the *Drawings* for



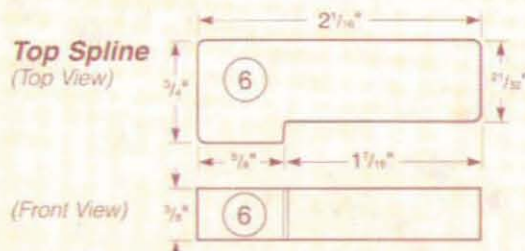
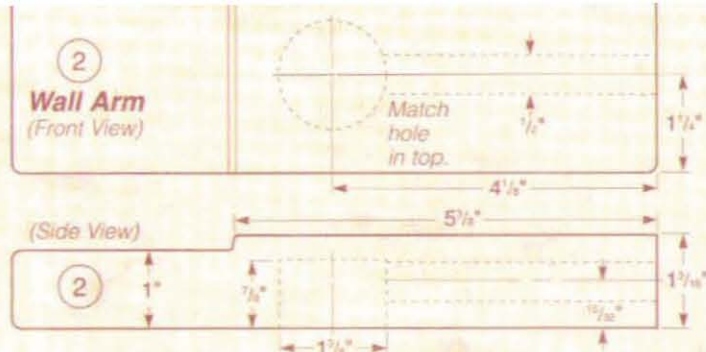
Screws attaching the arm and plate should barely slip through the holes in the plate. The holes in the arm are about half their diameter.

Wall Plate (Front and Side View)



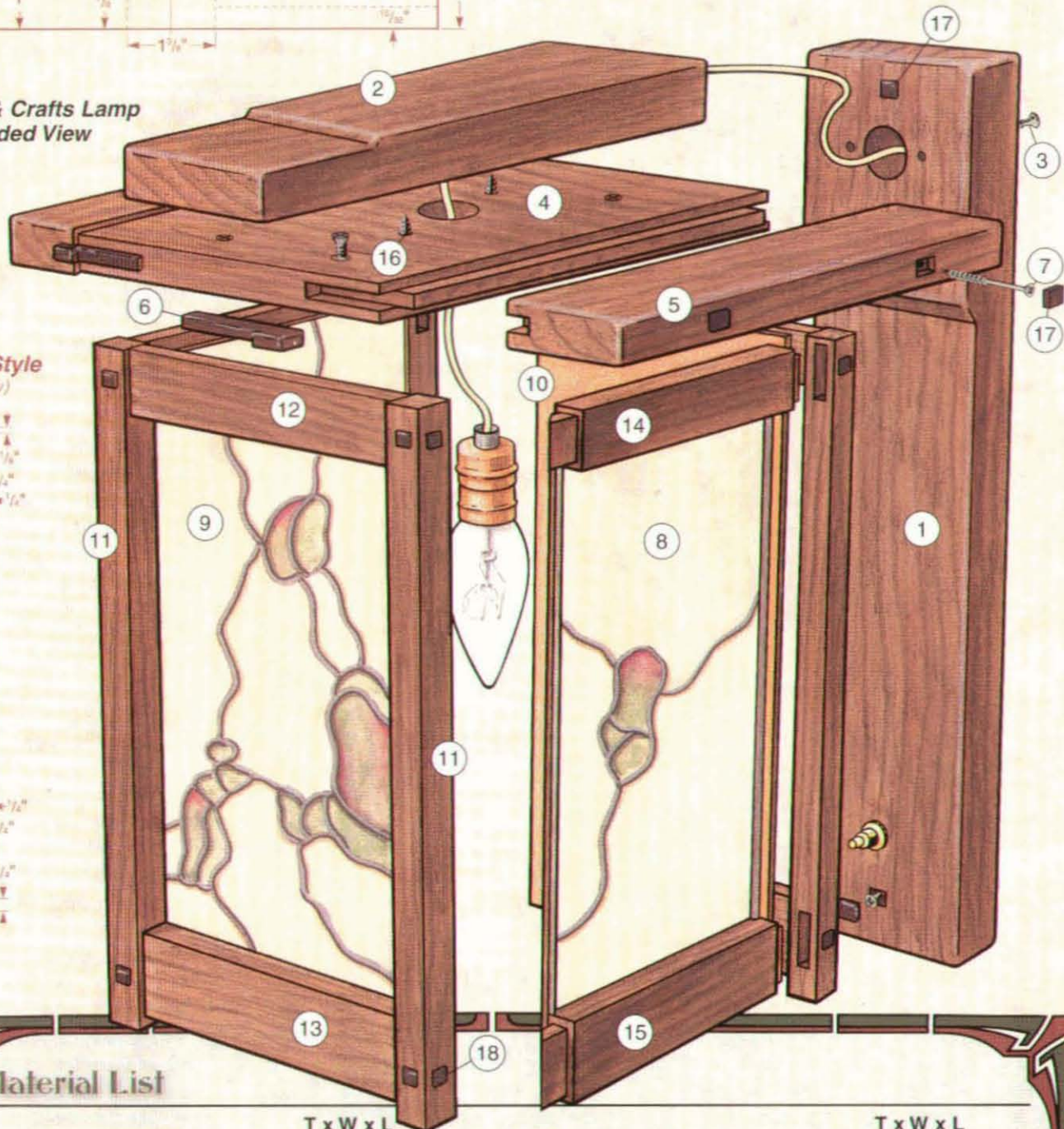
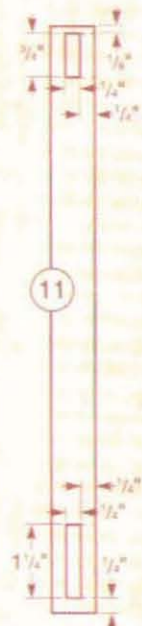
their locations, then drill your pilot holes, countersinking them for the screw heads. Now use your 1 3/8" Forstner bit to form the stopped hole on the underside of the arm for the wiring. Assemble the two parts without glue to test their fit, then remove the screws.

Chuck an extra long bit in your drill press to bore the 1/2" diameter wiring hole that extends to the access hole you just made.



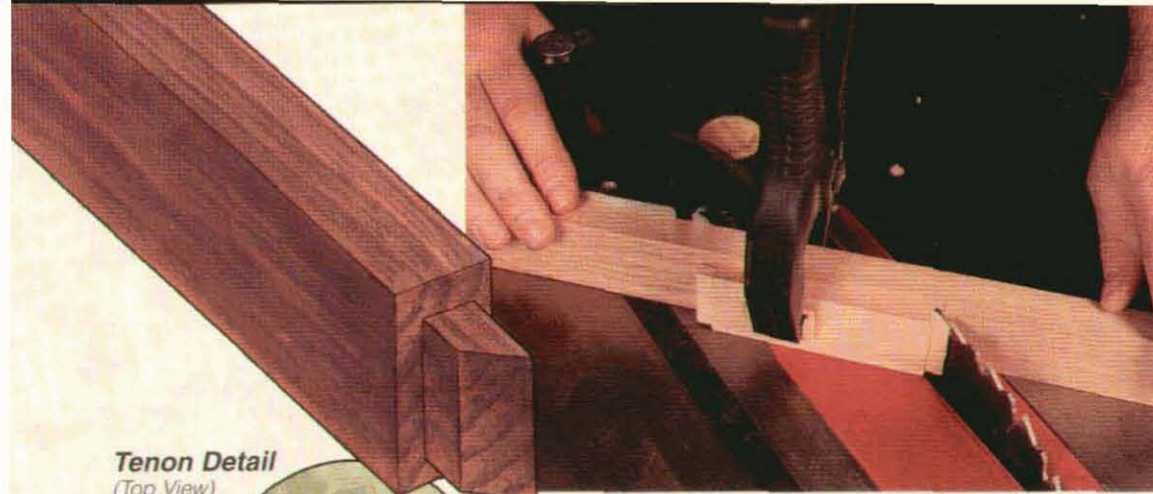
Arts & Crafts Lamp
Exploded View

Frame Style
(Front View)



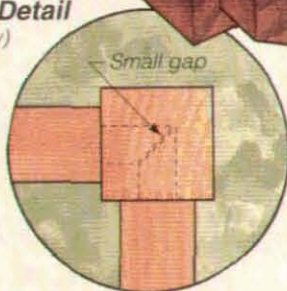
Material List

	T x W x L		T x W x L
1 Wall Plate (1)	1 3/16" x 3 7/8" x 14 1/2"	10 Colored Glass Back (1)	1/16" x 4 1/2" x 9 1/4"
2 Wall Arm (1)	1 3/16" x 2 1/2" x 8 1/4"	11 Frame Stiles (4)	3/4" x 3/4" x 10"
3 Screws (2)	#10 x 3"	12 Upper Front and Back Rails (2)	1/2" x 1" x 5 7/16"
4 Top (1)	11/16" x 7 7/16" x 7 3/16"	13 Lower Front and Back Rails (2)	1/2" x 1 1/2" x 5 7/16"
5 Top Endcaps (2)	13/16" x 1 9/16" x 7 3/4"	14 Upper Side Rails (2)	1/2" x 1" x 4 11/16"
6 Top Splines (4)	3/8" x 3/4" x 2 1/16"	15 Lower Side Rails (2)	1/2" x 1 1/2" x 4 11/16"
7 Endcap Screws (4)	#6 x 2"	16 Frame/Top Screws (6)	#6 x 1 1/4"
8 Stained Glass Sides (2)	1/8" x 3 3/4" x 9 1/4"	17 Large Plugs (6)	3/8" x 3/8" x 1/4"
9 Stained Glass Front (1)	1/8" x 4 1/2" x 9 1/4"	18 Small Plugs (16)	1/4" x 1/4" x 1/4"



Miter the ends of the rail tenons on your table saw. The tenons should not quite meet in their mortises, as shown in the detail at left.

Tenon Detail
(Top View)



A Top with Breadboard Accents

Asian in influence, the oversized top of this lamp is pure Greene and Greene. The top of our lamp (piece 4) is a simple board capped by a pair of breadboard endcaps (pieces 5). These are narrow but slightly thicker boards with their grain across that of the top. The endcaps are grooved and joined to matching tenons with two screws each.

Start by installing a $3/8"$ dado head in your table saw and mill a groove in one long edge of each endcap (see *Drawings* for dimensions). Stay with the dado head to create the tenons on the ends of the top. Dry fit the endcaps to the top to check their fit. Next drill slightly oversized pilot holes through the endcaps, to allow for wood movement. Chop square mortises to fit the ebony plugs that will later cover the screw heads. Return to the drill press and bore the stepped hole at the center of the top. The Greene brothers used ebony accents to add stylized elements to their pieces. Typically, as with this lamp, these were exposed splines or screw plugs. Now, band saw the four splines (pieces 6) to the shape shown in the *Drawings*, then lay out and chop their mortises in the end caps and the sides of the top.

Break the exterior edges of the top and endcaps with sandpaper and assemble the endcaps to the top with screws (pieces 7): these are driven through oversized predrilled pilot holes. Don't glue the endcaps in place: the screws will hold them while allowing for wood movement.

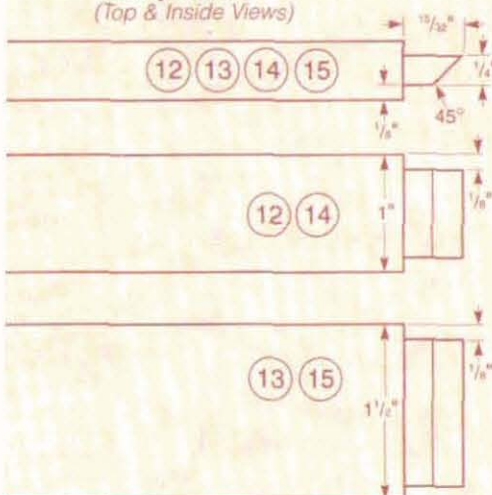
Stained Glass Framework

The three decorative stained glass panels (pieces 8 and 9) and the back panel (piece 10, a less expensive sheet of amber-colored glass), are protected and framed by a mahogany skeleton. Begin its construction by cutting the four stiles (pieces 11), the four front and back rails (pieces 12 and 13) and the four side rails (pieces 14 and 15) to the sizes in the *Materials List*.

Lay out the four mortises in each stile, according to the dimensions and locations shown on the *Drawings*. Chop these mortises by drilling out most of the waste, then paring the edges of each with a sharp chisel. Cut the tenons on the rails using your saw's miter gauge and a sharp dado head (see *Drawings*), and then switch to your crosscut blade to form the miters on the ends of the tenons, as shown in the photo above.

Next, locate and lay out the 16 small square mortises in the stiles, and chop these with a sharp $1/8"$ wide chisel. The plugs that will fit these

Lamp Rails
(Top & Inside Views)



Greene and Greene Styling

One hallmark of the Greene and Greene style was a soft, rounded edge treatment that added an exotic look to simple joinery. Chuck the smallest radius roundover bit you can find ($1/8"$ works beautifully, but they're hard to find) in your router and gently round all but the back edges of the plate. Then mill all edges of the arm except the face that is joined to the plate. Use a file and sandpaper to soften the transitional steps in both pieces, but make sure you don't leave scratches across the grain.

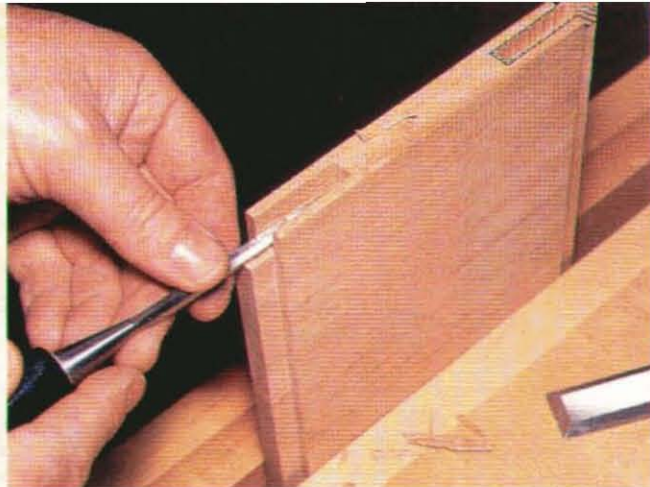
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Clean up the mortises for the ebony splines in the top with a sharp 1/8" wide chisel.

mortises are decorative. Dry fit the rails to the stiles. When everything fits, break all the long edges of the styles and rails, leave the ends as they are. Glue and clamp the framework together.

Applying the Dye

Sand all the mahogany elements of your lamp with 120 grit paper, then raise the grain with a damp sponge. After it dries, sand with 220 grit. Use a water-based aniline dye to stain the mahogany to a rich, deep brown. Add a small drop of dishwashing soap to the dye to break the surface tension and help the dye penetrate properly.

Apply the dye with a foam brush and wipe it off immediately with clean, soft paper towels.

Finishing and Final Assembly

It's a good idea to wear disposable (surgical) gloves during assembly, as the sweat from your hands could possibly lift the water-soluble stains and mar the surface.

Begin the assembly process by screwing the wall plate to the arm. Position the top on the arm by matching up the 1" holes at their centers. Drill pilot holes (see the *Drawings* for locations) through the underside of the top into the arm and then remove the top and drill pilot holes through the top side of the top for attaching the frame. After countersinking these holes, screw (pieces 16) the framework assembly to the top and then attach the top to the arm with two more of these screws.

Spray the assembled lamp with three coats of satin lacquer, sanding between coats with 600 grit paper.

Make the decorative plugs (pieces 17 and 18) by cross cutting them from lengths of appropriately sized square rod. Polish their top faces to gently break their edges before you cross cut and epoxy them into their mortises. Secure the glass panels in place with more epoxy. Install the ON/OFF switch, the lamp receptacle and complete the wiring next.

Be sure to use a small (40 watt) bulb and locate your lamp where it will serve both to light up a dark area and act as a wonderful accent piece that illuminates your woodworking skills.

Mike McGlynn, contributing editor for the Woodworker's Journal, is a professional woodworker with an expertise in the Greene and Greene Arts & Crafts tradition.

Mahogany and ebony construction surround the stained glass panels in this wall lamp. It is simply made, yet rich in details — the legacy of the Greene brothers' designs.

Floating Ebony Splines

Contrast, texture and shape are all created once the floating ebony splines are placed into the lamp's breadboard top. Cut them to shape on the band saw, then test their fit in the clamped-up top. The section of the splines which extends into the breadboard endcaps must float freely within the mortise. When you're satisfied with the fit, break all the exposed edges of the splines with sandpaper and polish them to an ultra smooth finish.

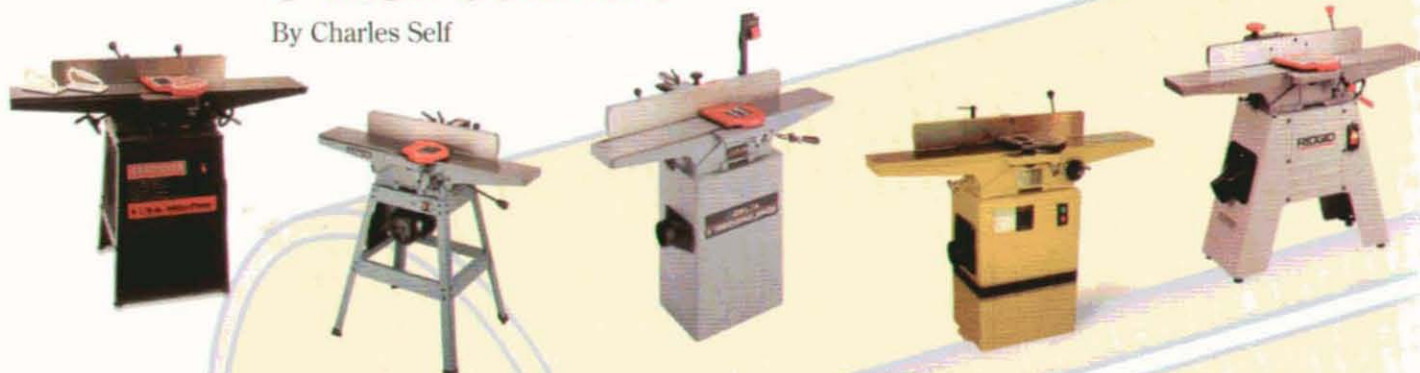


Start with a band saw to form the decorative splines, then complete their organic shape using files, scrapers and sandpaper.



6-inch Jointers

By Charles Self



The author based his evaluation on seven machines from six manufacturers. There are more jointers available, but this sampling will give you a solid feel for the features and options to keep an eye out for, if you're in the market.

Jointers come in many sizes, ranging from the tiny benchtop 4-inch models that are under 20 pounds, on up to commercial behemoths 16 inches wide and heavy as a ton of bricks. For the smaller pro and amateur shops, the 6-inch jointer is the most frequent tool of choice. As a machine, the jointer is only modestly complex.

Two tables — infeed and outfeed — are separated by a cutterhead that fits between and slightly below them. The cutterhead is driven by a motor mounted below the beds, with a belt driven from a pulley on the motor to a pulley at the back edge of the cutterhead.

Every jointer has a fence, and center mount fences are best. The fence adjusts from very close to the operator's front edge of the jointer to just off the back of the blades, so that width of cut is infinitely variable within the capacity of the machine. The fence can also be tilted, usually both

towards and away from the table. Along with being center mounted, the better fences are extremely rigid. The fence on the Delta 37-195 offers a unique adjustment system for this size unit, a rack and pinion. All the other 6-inch

models present some version of the bump and check system, which has served well for many years.

There is a fence mounted back guard to keep the operator's hands out of the cutter knives from the rear, and a spring-loaded cutter guard that does the same thing from the front. The front guard is easily removed, but is sensibly left in place, except for very specialized operations such as rabbeting.

The cutterhead is round, accepting three knives. Adjusting the infeed table is the usual way to set cut heights. The outfeed table is adjustable on most jointers, but once set is seldom changed.

Longer beds give you a more stable feed and a smoother, more accurate cut. Most 6-inch jointers come with an overall bed length (both feed tables, plus the bridge distance over the cutters) of about 48 inches. Infeed and outfeed tables are generally around 23 inches long.

Fit and Finish

Fit and finish, and assembly, are of interest to all of us, as they often indicate both quality and price of the tools being checked.

All the machines reviewed here went together with reasonable ease, but I recommend that you get a second person to help, particularly when lifting the units onto their stands.



Craftsman 22724

1 HP

Price: \$399.99

Phone: 800-349-4358

www.sears.com



A cut depth indicator (left) and a depth adjuster (above) are features that help you accurately make use of the Craftsman jointer.



Delta 37-190

Delta 37-190 & 37-195

3/4 HP and 1 HP
Price: \$403 and \$499
Phone: 800-321-9443
deltawoodworking.com



After assembling the lot, I found fit to be no problem. Finish is another matter. None of these machines was as slick looking, at least as far as paint goes, as we'd expect in a U.S. made machine. Grizzly, for once, wasn't the roughest looking: that honor was

Shop Test continues on page 58 ...

Delta's infed adjuster is a lever with a lock.

Delta's 37-195 has a unique (at least in 6" jointers) rack and pinion fence adjustment, shown at left. The stalk-mounted paddle switch (above, left) allows for quick, easy access.

Delta 37-195

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SHOP TEST

shared between the 37-190 Delta and the Powermatic 54. Let's note, however, that the paint has little or nothing to do with how the machine works.

All tables were nicely milled and reasonably flat. The Craftsman table had the finest milled finish, but the gap wasn't much. I did a quick check for flatness on the tables, and found them within .004 inches, which is sufficient for good accuracy on this tool.

Ridgid and Grizzly shared the orange plastic covered knobs that are great for grip and just as great for control feel. They are a little hard to keep clean, but otherwise are an advance over slick plastic knobs.

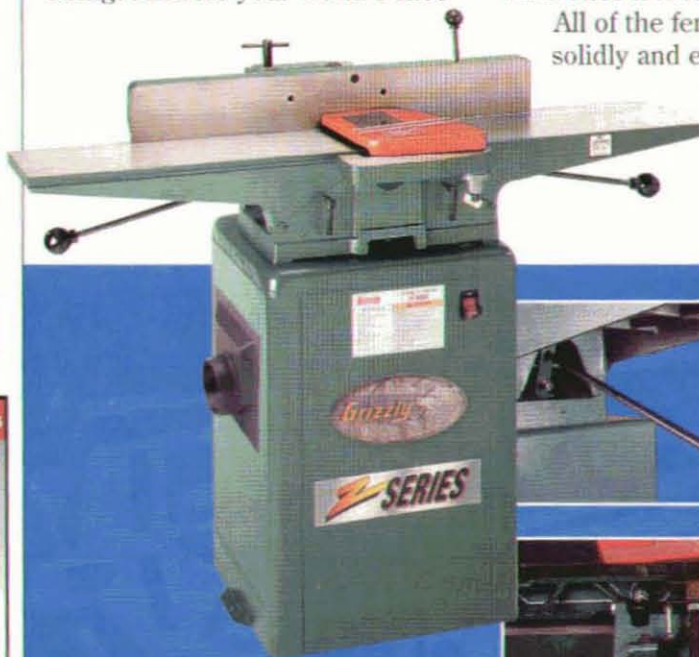
Fences

All fences on these machines are center mounted and are massive enough to afford a stable background for your work. Fence

length, thickness and adjustment vary considerably. The Grizzly fence is 29 $\frac{1}{16}$ " long and 4" tall, with a massive 1 $\frac{1}{4}$ " thickness. JET's fence is 29 $\frac{3}{16}$ " long, 4" tall and 1 $\frac{1}{4}$ " thick. This is not the only place the JET and Grizzly fence assemblies are closely akin. Both adjust with the same sort of slide unit, with only minor differences. Delta's 37-190 has a 29 $\frac{3}{16}$ " long fence, tall at 4 $\frac{1}{2}$ ", and massive enough at 1 $\frac{3}{16}$ ".

The Ridgid fence is 29 $\frac{1}{2}$ " long by 4" tall, and 1 $\frac{1}{4}$ " thick. The Craftsman fence is 28", with a height of 3 $\frac{3}{8}$ " and a thickness of 15/16". Delta's 37-195 offers a very long, very massive fence; 34 $\frac{3}{4}$ " long; 4 $\frac{3}{4}$ " high and a really nice 1 $\frac{3}{8}$ " thick. This fence is also the only one with a rack and pinion adjustment. The adjuster takes some getting used to, but is easy to use and lock, and very solid once it is locked.

All of the fences locked solidly and easily on their center mounts. I checked the security at 90



Grizzly G1182Z

1 HP

Price: \$395

Phone: 800-523-4777

www.grizzly.com



Grizzly's offering has lever adjustment for both the infeed and outfeed table.



Grizzly's jointer — like the JET model — also features a massive fence mount.

degrees and an interim setting. The only positive stops on the fences are at 90 degrees, and all are readily and easily adjustable. The easiest fence to lock was the Delta 37-195, because of its adjustment style.

I found a slight bow in all of the fences, but nothing that was enough to throw off a feed badly. Some reports of various brands with bad bows have cropped up on the Internet. It pays to check with a good straightedge as quickly as possible. It is difficult to say how much bow is bad for a particular use, but if you have trouble with the jointer, and the fence is bowed over .004, get in touch with the manufacturer's customer service.

Shop Test continues on page 60...

Powermatic 54

3/4 HP

Price: \$549

Phone: 800-248-0144

www.powermatic.com



A top view of the Powermatic model shows the basic configuration of a 6-inch jointer. The massive fence mount is similar to some of the others'.

Powermatic's adjustment wheel for the outfeed table is under the table.



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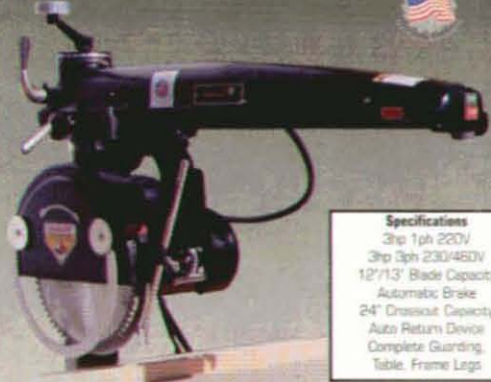
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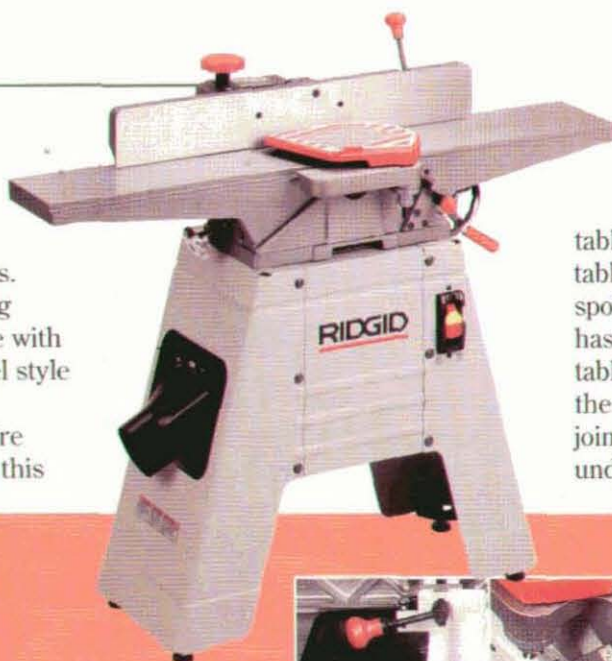
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Table Adjusters

Table adjusters take two forms. Lever style adjusters have long been accepted as easier to use with heavier tables. Recently, wheel style adjusters have become more popular, with claims that they're more accurate. I used both in this test, and prefer neither as to accuracy or speed. For me, gross adjustments for daily work are easier with levers while fine adjustments are easier with wheels. The JET's front wheels make for the easiest fine adjustment anyone can expect from a jointer. Powermatic has a front wheel for the infeed



Ridgid JP0610

3/4 HP

Price: under \$500

Phone: 800-474-3443

ridgidwoodworking.com



Ridgid's fence mount is a little different than the mounts featured on the other 6-inch jointers. Its knob handle levers, with soft knob covers, are easy on your hands.

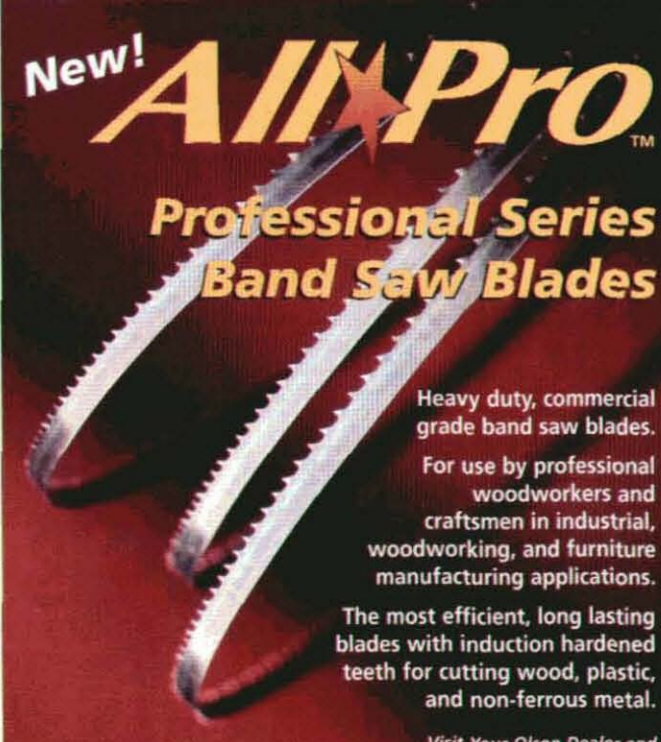
table, and a knob for the outfeed table located in the more standard spot, under the table. Delta's 37-295 has a locking lever for the infeed table and an under-table knob for the outfeed adjustments. Ridgid's jointer has wheels, both mounted under the tables. Grizzly's G1182Z has two quick adjust levers. The open stand Delta 37-190 has a lever infeed adjust and a knob outfeed. The Craftsman Contractor's Series 22724 has two wheels, set under the tables.

Shop Test continues on page 62 ...

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Easy to read adjustment scales are operator friendly. JET's front-mounted adjustment wheels (main image) are a great feature.



Bases

Every jointer needs a stand or base. Enclosed bases make dust collection an easier chore. Most enclosed bases come with 4-inch dust collection connectors. If dust collection is not set up for 6-inch closed base jointers, and the connector is installed, the chips and dust will quickly feed back and come out around the knives as the machine operates. I first discovered this on the Ridgid, and for a moment thought it was brand specific. It isn't. Every other 6-inch jointer that was tested with the connector in place and no dust collection did the same thing. It is a nuisance.

Open bases may make dust collection harder, but do not suffer the feedback problems. Open-based machines are also usually a little cheaper. The Craftsman 22724 and the Delta 37-190 were the only open stand machines I tested. The Craftsman had no provisions for dust collection at all. The Delta 190 had a feed chute with a 4-inch connector.

Powering the Work

The range of horsepower in 6-inch jointers starts at 3/4 and runs to 1 horsepower. In every case, I found plenty of power to work with when flat jointing 6" wide walnut with a cut of 1/16". Jointing board edges even past the recommended 1/4" worked with reasonable smoothness and no power problems with all machines. Rabbeting ledges would all peel off well over 1/4" at a time, smoothly finished and with no drain on the motor.

As with all finishing cut operations of this kind, shallower cuts produced best results. Cuts of 1/16" depth always finished more smoothly than did cuts of 1/4" depth.

Things For You to Check

Before you bring a new jointer home, be sure to look for the following items:

Switch position: Is it comfortable for you and easy to reach. The Delta 37-195 has an unusual switch, standing on an

arm about 18 inches above the table. It is the easiest to reach.

Table flatness: Check with a feeler gauge and a straightedge. Less than .005 is acceptable.

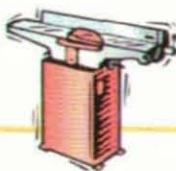
Height from floor: This is not wildly different between machines, but the Craftsman is an inch taller than the 32 $\frac{1}{2}$ " tall (to the table surfaces) of the Delta 37-195, while the JET, Grizzly and Ridgid are each about an inch shorter yet. This is one area that is truly an individual's preference.

Stand style: Closed or open, the stand is little more than a way of getting the machine up where you can use it. Closed stand models offer better dust collection than do most open stand models, are heavier — thus, suffer less from

vibration (all else being equal), and, as you'd expect, cost more.

Dust collection: Of varying importance to different people; you need to either have effective dust collection or wear a dust mask or respirator.

Add an extra set of knives to your purchase (\$30 - \$60) so you don't suffer down time when the original set has to be sharpened.



My Personal Choice

This is a tough one. I would be glad to have any one of these jointers in my shop — there is not a loser in the bunch. Every one can do the work which makes jointers a "must have" woodworking power tool. If I was forced to pick one, I'd go with Delta's 37-195. I like the unique and useful fence adjustment system and the easy-to-access "switch on a stalk" ON/OFF switch. It also has an enclosed base, which happens to match my personal preference for ease of dust collection.

Charles Self is an award-winning author and a frequent tool tester for Woodworker's Journal.

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Heavy-duty Drawer Slides

By Rob Johnstone

Most of the furniture we build will still be in daily service when our grandchildren retire. Viewed in that light, the cost of upgrading from standard to heavy-duty drawer slides isn't such a big deal. But the benefits sure are. A slide rated for 300 to 500 pounds will operate beautifully for a drawer full of heavy books or documents, but it also will endure many more decades of use than a slide rated for light use (say, 50 pounds).

Installing them is a snap. Begin by building your drawers so they're exactly 1" narrower than the opening. (Check the specifications that came with your drawers: there are a few versions

that use metric measurements.) This allows 1/2" on either side of the drawer, which is exactly the right clearance for the slide to operate properly. More than 1/2" means the slide operation will be sloppy: it may even derail. With less than 1/2", the slide will quickly bind.

Most slides are screwed in place along the bottom edge of the drawer side. To locate the matching receivers inside the cabinet, use a paper template (usually included with the slides), or an aftermarket plastic template (available for most brands of slide), as shown in the photo sequence at right. In either case, follow the individual manufacturer's instructions.

Slide Ratings

Slides that run on ball bearings will always outlast and outperform slides that rely on friction between two metal surfaces.

Light-duty slides handle loads up to 75 pounds, while a medium-duty rating extends the limit to 120 pounds. Anything over 120 pounds gets a heavy-duty rating.

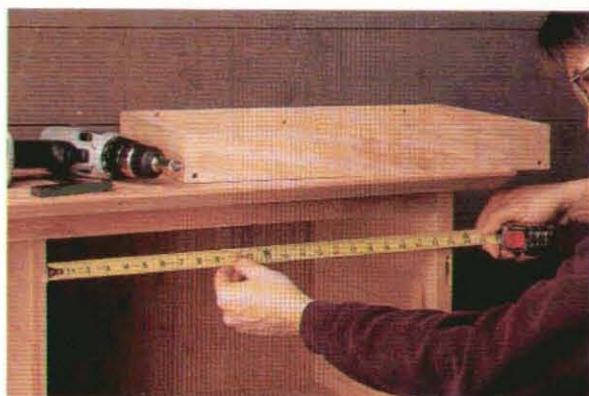
Light-duty slides are usually limited to 3/4 extension (meaning they extend 3/4 of their length). Your favorite kitchen utensils always seem to find their way to the backs of these drawers, out of reach.

There are drawer slides for every application. From tiny pencil drawer slides to computer keyboard slides, on up to massive 60" long slides developed to support over 500 pounds of tools!



Just a few common tools are all that's required to install most drawer slides. Shown here is the base unit of Rick White's China Cabinet, featured on page 42 of this issue.

Installation Basics



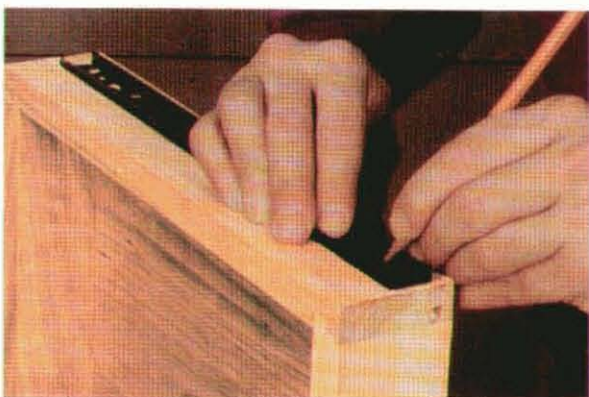
Build the drawers 1" narrower than the opening, allowing 1/2" on either side of the drawer box. Some imported metric slides may require slightly different allowances, so check the specific instructions first.



If there's more than one drawer in an opening, space them so the bottom drawer has enough clearance to slide properly, then divide the remaining area equally among the drawers.



The slide receivers must be mounted truly perpendicular to their openings. Lining up the screw holes is best done with a template (inset), or by aligning the slide with pencil marks drawn along a square. If the slides aren't absolutely parallel, your drawer will never glide properly.



With the receivers installed in the cabinet, use the slides as templates to locate screw holes in the wooden drawer sides. Screw the slides to the drawers, slip the drawers into the cabinet.

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Prefinishing: Work Backwards When You Can

By Michael Dresdner



Most woodworkers would agree that there is a natural order to things. First you build the piece, then you finish it. But the truth is that often, it is much better to do it the other way around: finish first, then glue up the parts. Finishing the separate parts before you assemble them is called prefinishing. This may seem twisted, but there are some decided advantages to working "backwards."

Why Prefinish

One advantage is that large case goods, like bookshelves and cabinets, are much easier to handle as separate flat panels before they are glued up. You can manage each piece and lay it horizontally on horses, as shown at right. You'll find that you will sand more uniformly when you don't keep butting up against an adjacent vertical surface, and consistent sanding will result in more uniform staining. Puddles of stain won't

hide in corners only to ooze out again after you have turned away, and no unsanded areas will show up darker or lighter. When you do move on to clear coats, there will be no hard-to-reach inside corners, and no vertical surfaces to surprise you with drips and runs.

Glue spots are another surprise you can eliminate. How often have



It's a lot easier to finish the sides of a bookcase as separate flat panels laid horizontally on a couple of horses.

When you can't disassemble your project to prefinish, remember to avoid placing a fully loaded brush into an inside corner. Start with the bristle tips an inch away from the inside edge and draw the brush away. When it's partially unloaded after 8 or 10 inches, double back and pick up the inside corner, blending it into the rest of the stroke.

Whenever you can, turn pieces so you are always brushing out a horizontal surface, saving the outside for last. If you must brush on vertical surfaces, put on thinner coats to avoid drips and runs.

you stained a piece, only to find that some glue squeeze-out suddenly shows up as a very obvious bare spot? If the glue goes on after the finish, squeeze-out doesn't even stick. You can pop off dried glue with a flick of a pointed dowel.

Good Candidates

Of course, not all pieces can be prefinished. Dovetailed joints, for instance, need to be sanded after assembly. The same goes for contoured surfaces that get shaped after glue-up. But you'd be surprised at how often you can prefinish — virtually any piece where you can sand right up to the glue joint.

On case goods with flat panels that meet one another, you can mask off dowels, biscuits, dados or sliding dovetail joints, and sand and finish the flats first. With mortise and tenon joints, the shoulders define where the glue surface stops. It's also easier to finish separated tabletops (separate from their bases, with or without the apron attached) and anything with removable doors or shelves. When you can't finish all the parts in advance, consider finishing some of them. Leave the back off

the piece, even if the case must be assembled. At least you'll have fewer inside corners to deal with.

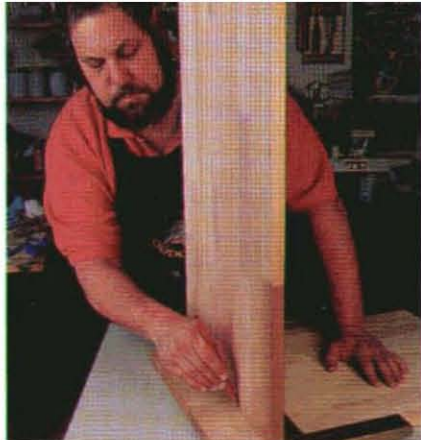
On raised panel doors, you can finish the panels first, assemble them, then finish the frames afterwards, as shown at right. Why bother? With floating panels, there is room for stain to collect in the groove where they enter the frame. That excess stain can run back out when you lift up the door. Another advantage comes later, when the piece is all finished and subjected to winter heating. Often a panel will dry out and shrink enough during the heating season so that an unfinished line shows where the panel meets the frame. If you prefinish the entire panel, even the part that will be captured by the frame, there will never be an unfinished line, no matter how much the panel shrinks.



With raised panel doors, finish the panels first to avoid an unfinished line later.

How To Do It

The prefinishing process is simple. Sand all the parts to the point where they are ready for their first coat of finish. Mark off the areas that will be glue surfaces and mask them. In most cases, this will mean dry assembling the parts, then marking the edge of the glue line lightly in pencil, as I'm doing in the photo above. Mask just about 1/16" inside the pencil line. That will let the finish



Mark glue surface areas with a pencil line at the joint, then mask the area inside the line.

go slightly under the joint so you'll never have raw wood showing, but not far enough to weaken the glue joint itself. Lay down the masking tape and burnish the edges with a tool handle or smooth piece of wood to guarantee a crisp, thin edge. Remove the light pencil line with an art gum eraser, or by wiping it with some denatured alcohol. On a mortise and tenon,

continues on page 68 ...

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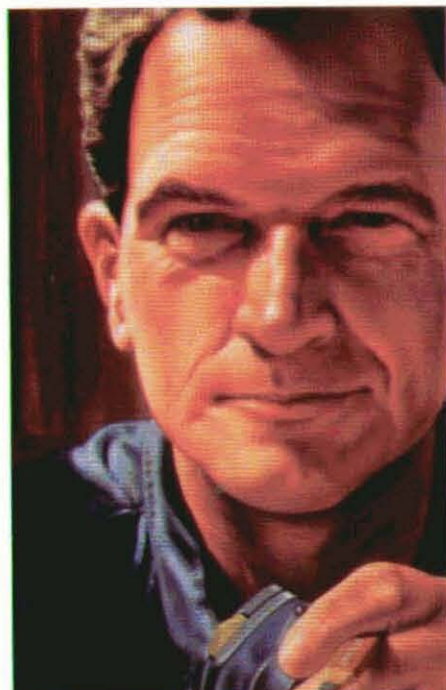
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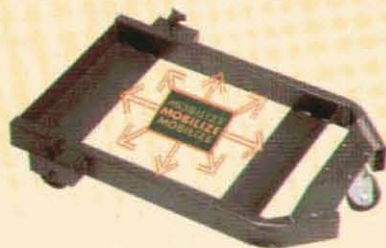
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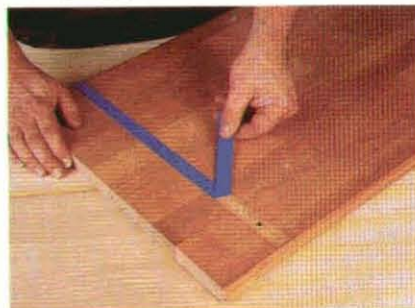
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FINISHING THOUGHTS

you can mask over the mortise hole and cover the tenon so that you don't accidentally get finish on any of the glue surfaces.

Now, go ahead and brush, wipe, or spray on whatever finish you choose. I'll often apply the whole finish, including rubbing it out with paste wax, before I assemble the piece. Once the finish is dry, remove the masking tape, but don't just yank upward on it. Pull the tape back over itself so that it forms as tight a bend as possible, at about a 30 degree angle away from one finished edge, as shown in the photo below. It will come off cleanly and leave a sharp line.

Spread the glue on the joint and assemble the piece. When you clamp, make certain your clamps are padded so you don't mar the finish. Since you pre-fitted everything before you finished it, you should not need much clamping pressure, so be gentle.



To remove your tape in a clean, sharp line, pull back at a 30 degree angle.

Special Tapes

The tape you use in this process cannot be just any masking tape. Garden variety tan masking tape tends to leave adhesive residue on wood, which can block the assembly adhesive. In addition, stain creeps under it, some finishes dissolve the adhesive, and if it is left on too long it will tear instead of peeling off clean. We'll need some specialty tapes instead.

I use three different 3M brand tapes for prefinish masking. I'm



3M's tapes don't leave residue that could interfere with the glue joint on your wood.

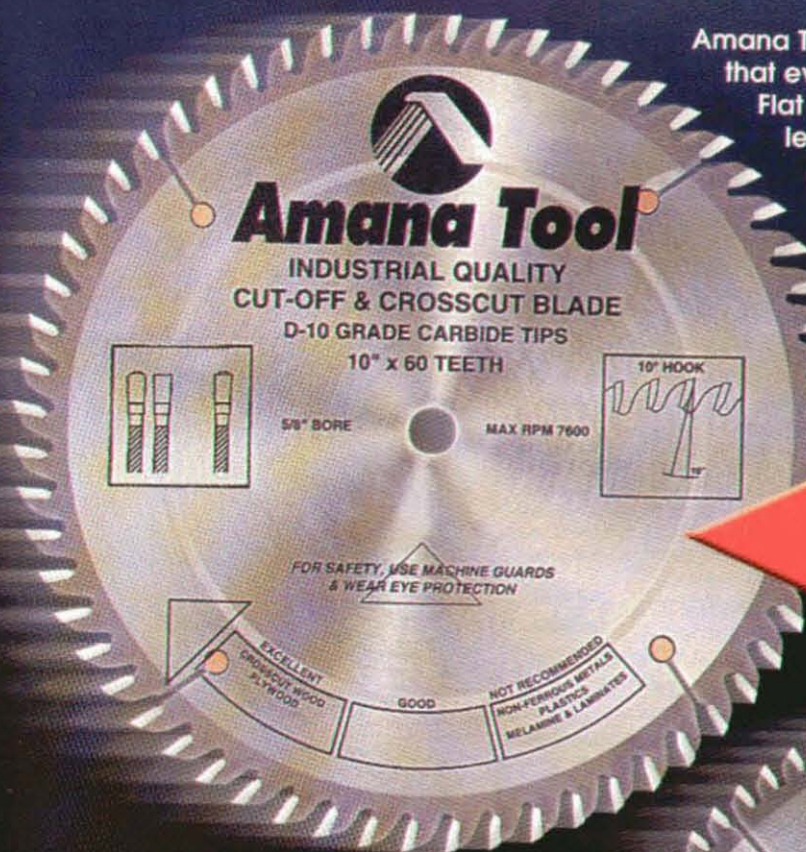
partial to 3M because they not only make very high quality tapes, they color code them so it is easy to tell them apart. For the cleanest line for all types of finishes, I use their bright green lacquer tape. It will resist stains and even lacquer creeping underneath, and will peel off cleanly, if it is not on too long. When I need to leave the tape on more than a day or two, I switch to the blue 2090 Long Mask tape. It can stay on for a week and still come off without tearing or leaving residue. It doesn't leave quite as crisp a line as the green tape and it is not waterproof, so is not as good for water-based coatings. If I can't use the blue tape, but my finishing schedule lasts more than a couple of days, I remove the green tape and remask with a fresh piece before I apply the next coat.

The one problem with both these paper-backed tapes is that, while they are great for masking straight lines, they don't deal well with curves. That's where the light green Fineline tape comes in. It is a plastic-backed tape that can curve to mask any shape. All three tapes will work for prefinishing, as none leave adhesive residue on the wood to interfere with your glue joint.

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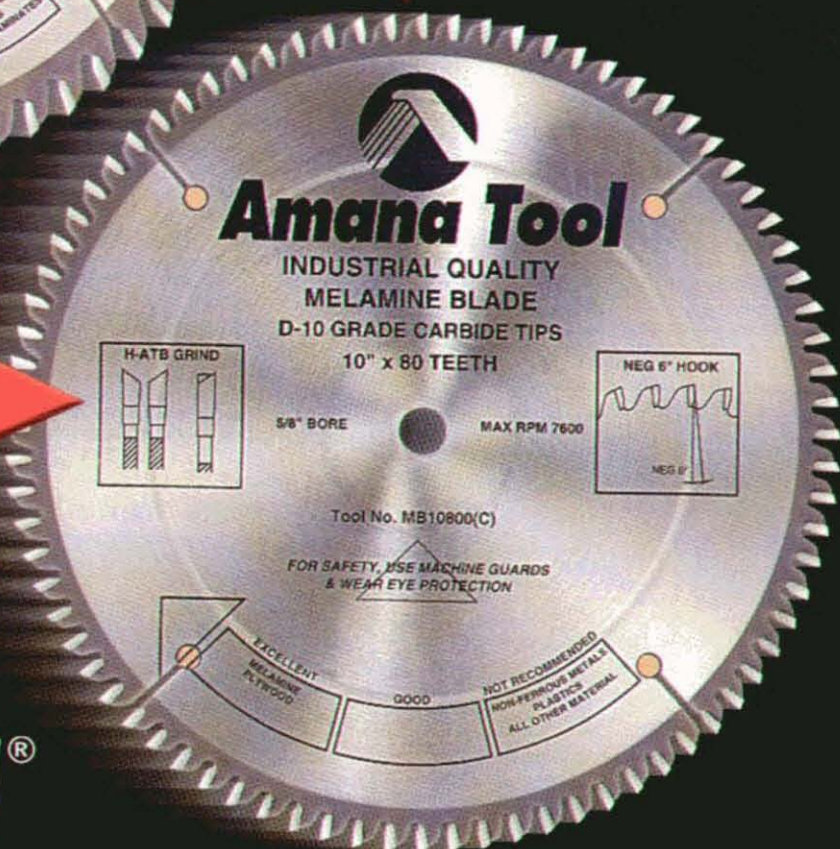
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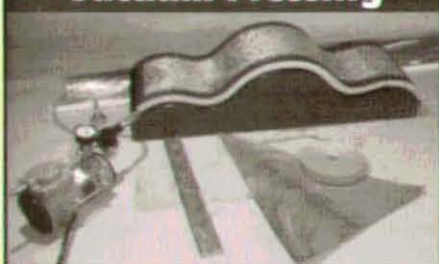
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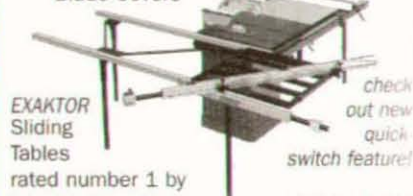
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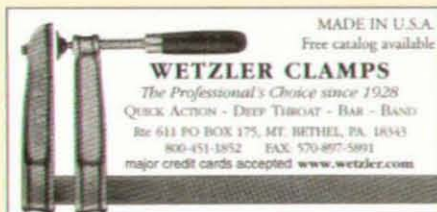
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Bob Filipczak

What You're Missing

I recently took a stroll through our eZine's archive, and it was eye-opening. I knew we had generated a lot of woodworking tips,

plans, techniques and solid information over the last year, but I didn't realize how much, until I put a number to it.

Our new search engine says we've topped the 500-page mark, but that's only part of the story. After almost a year, I'm amazed by the sheer depth and diversity of the information we've gathered, most

of which is archived and still available. We've talked to a vast array of professional woodworkers, industry insiders and well-known experts. But most importantly, we've talked to you, and those are the most valuable discussions. You've been so encouraging to us that it's a joy to put this eZine together for you.

So, thanks for all the good words. And, if you're not subscribing to our award-winning eZine yet, please point your browser to the red link below and join the conversation soon — and remember, your subscription is FREE!

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Those are some tough biscuits!

Norm and his biscuit joiner are a constant source of conversation out on the web forums. Here's one discussion about the strengths and weaknesses of this new joinery tool.

What starts as an innocent comment or question easily digresses in some strange directions. This woodworker just purchased a biscuit joiner and asked the group how far apart to place biscuits for a tabletop he was gluing up.

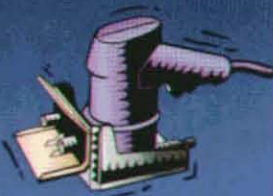
The first respondent suggested putting in a biscuit every 8" - 10" and went on to praise the utility of these tools. The next woodworker said that "biscuits are used mostly for alignment as they don't really add much strength to a joint." The third participant wrote,

"I still don't understand what great advantage this tool provides." He even suggests that "a biscuit joiner might be just a fancy tool that most woodworkers don't really need."

The next respondent tells the group, in no uncertain terms, that biscuits have made many projects possible that he couldn't have done otherwise. He writes, "You can use them in a butt joint to get close to mortise and tenon strength with a fraction of the prep time."

Near the end of the thread, someone cited a study done using lag bolts, tongue and grooves, dowels, loose tenons, mortise and tenons and a double or triple biscuit joint. The biscuit joint, he claimed, beat them all in terms of bending strength.

"A biscuit joiner might just be a fancy tool that most woodworkers don't really need."



What our subscribers are saying:

"I read every word and follow every link in your online woodworking eZine, and I'm always inspired and challenged."

"When I read the meringue story, I laughed so hard I was crying by the time I got to the end."

"Lots of things on the eZine have been quite helpful."



Your questions... answered by our experts online

Q "I do runs of molding in the 1,000 - 3,000 foot range on a Delta RT 40. I'm thinking of mounting a power feeder onto the saw, but I'd like to hear the pros and cons before I do."



A (Ellis Valentine) "On the plus side, power feeders keep the wood in constant contact with the fence and table, they produce a uniform width and edge quality, they greatly speed up the process, and they keep your fingers away from the blade. I can't think of any cons unless you have to mount and unmount the feeder every time you use the saw."

A (Rick White) "My first response is: 'what took you so long?' I love my power feeder and have been using it for years. They give you much more control over your materials and you get better results with increased safety. Those are three powerful reasons to go out and get one."

A (Ian Kirby) "The advantages of power feeders are 1) a hold-down in front and in back of the cut, 2) the work held tight to the bed of the machine and tight to the fence, and 3) the work propelled past the blade at a constant pressure and at a constant speed. The outcome is the most accurate dimension cut you can get."

Selecting Your Router Bits

By Bill Hylton

Picture this: it's Saturday morning and you're in the shop. Your brand new router has just been unpacked and you're *really* itching to put it to work. But instead, here you are flipping through a catalog, looking at router bits. That's because your pitiful "starter set" of six bits from nine years ago suddenly looks pretty grim next to that new router.

A catalog is exactly the right place to begin checking out bits and their profiles. If you already know where you'll be going with your new router, you can zone in on specific bits. If not, read on ...



Straight bits come in a wide variety of sizes and options, but a basic router set should include all the most useful diameters: 1/4", 3/8", 1/2" and 3/4".

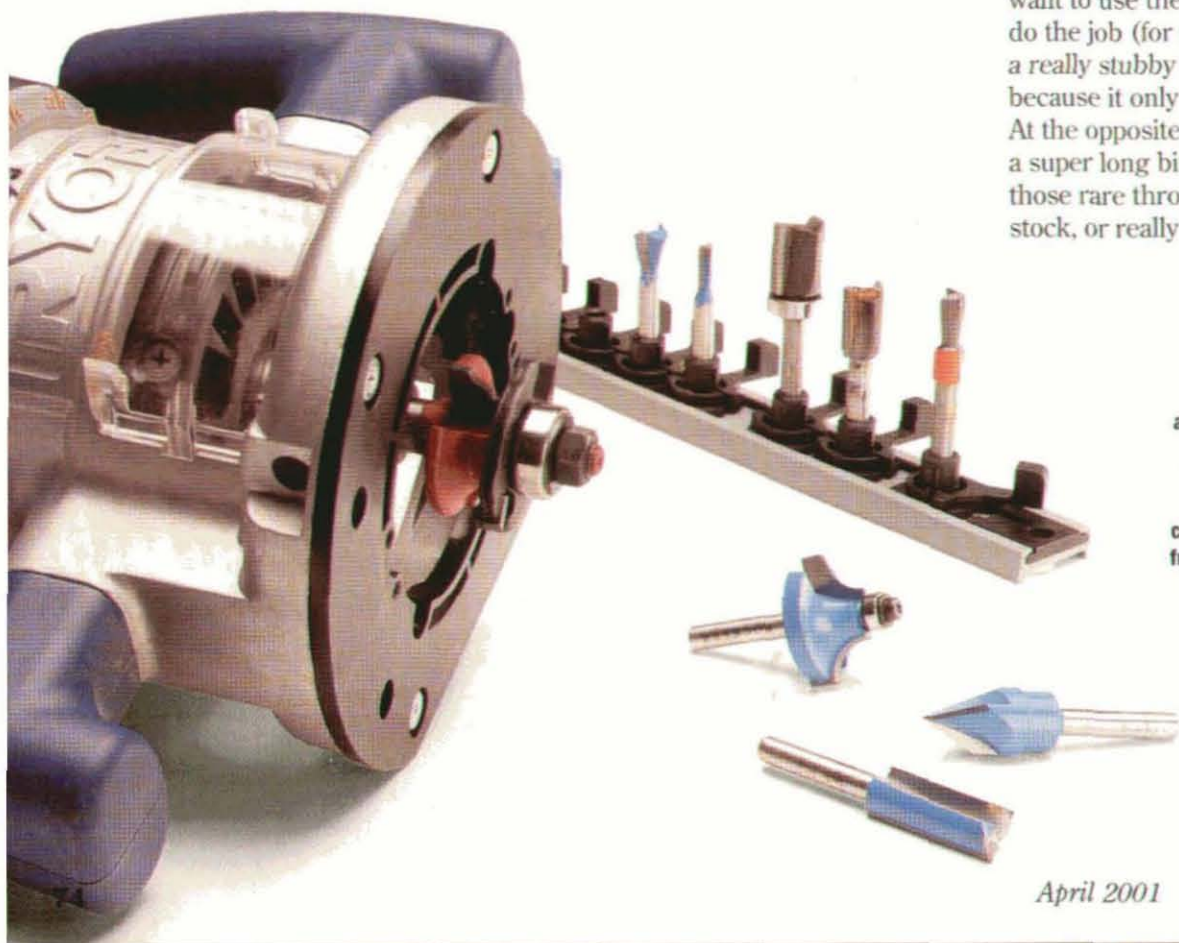
Cutting Joints

Buy straight bits first. The router is a crackerjack joint cutter, and straight bits are all you need for the majority of joinery cuts — dadoes, grooves, mortises, tenons, laps, half-laps and even rabbets.

But even with straight bits, the choices can be confusing. A good catalog will offer options such as varying numbers of flutes, spiral or stagger-tooth configurations, a welter of diameters and lengths, and a choice of 1/4", 3/8" or 1/2" shanks. So, how will you know what to buy?

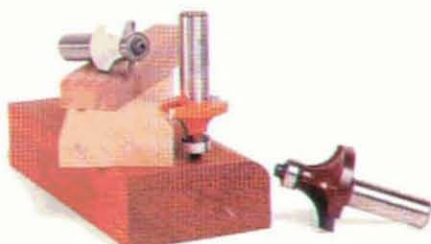
Relax. You can begin with the basics and add special application bits as your skills and needs continue growing. To me, the basics are 1/4", 3/8", 1/2" and 3/4" with cutting edges between 3/4" and 1 1/4" long. They'll handle a wide range of jobs, from 1/8" deep dadoes to 1" deep mortises. While you always want to use the shortest bit that will do the job (for safety reasons), a really stubby bit has limited use because it only makes shallow cuts. At the opposite end of the scale, a super long bit may be essential for those rare through cuts on thick stock, or really deep mortises.

Store your bits in a shop-built or commercially available stand. Carbide cutters are very brittle and can chip with the smallest contact. Also, keep your bits free of moisture. Remove the bearings and store them in a shallow tray of oil.



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Almost every bit set you're going to find in one of those catalogs includes a rabbeting bit and some bearings. Change the bearing size, and you change the width of the rabbet it cuts. The bearings enable a single bit to make cuts of perhaps half a dozen different widths. Most rabbeting bits come with one large bearing that's the same diameter as the cutter. This transforms the bit into a flush trimmer, for cutting veneers and laminates flush with the substrate to which they have been attached.



Profiling bits use a ball bearing attached to the bit, or a fence attached to the router or a router table, to guide the cutter as it mills a decorative profile along the edge of a board.

Most basic sets also include a dovetail bit, which may seem unnecessary unless you have a dovetail jig. However, even without the jig, a dovetail bit allows you to cut numerous joints, including sliding dovetails (which, by the way, are employed to great advantage for the shelves in Rick White's China Cabinet, featured elsewhere in this very issue).

Today's Shop continues on page 76 ...



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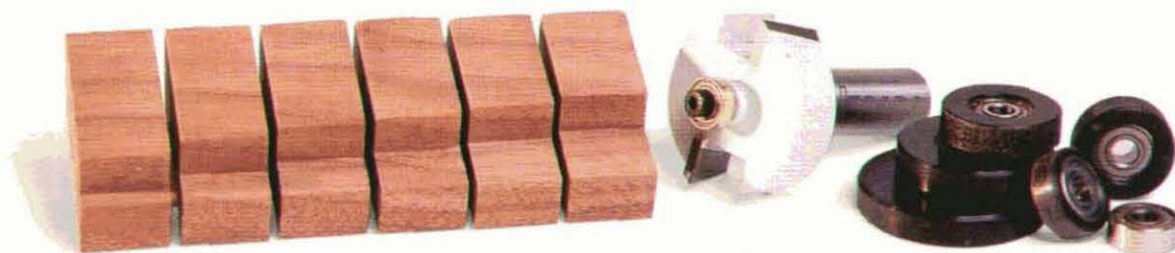
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Profiling Edges

A decorative profile (that is, a contoured relief) lends an air of character and style to a workpiece. The profile can be machined directly on the edge of a tabletop or door, or applied as an attached molding. The range of profiles available is unbelievable. Typically, a profile cutter has a pilot bearing on the tip. The bearing rides along the work edge, ensuring that the cut can't veer into the middle of the stock. Some profile bits can also be

used in the middle of a board. These are called groove-forming profile bits, and they don't have a pilot bearing. When they're used on the edges of work, they're guided by a fence attached to the router (called an edge guide). For example, with an edge guide on your router, you can use a core box bit (a groove-forming bit that cuts a round-bottomed channel) to produce the same edge profile as a standard cove bit (which is used to cut a half-groove on an edge).

Begin assembling your collection of profiling bits with cutters that produce simple profiles such as roundovers, coves and ogees. Check out a catalog to familiarize yourself with these shapes.

I find that I use small radius roundovers (1/8" and 1/4") more than larger ones (3/8" and 1/2"). Smaller bits break an edge without making it look bullnosed. (When you want a bullnose look, a roundover bit can produce it in

Today's Shop continues on page 78 ...

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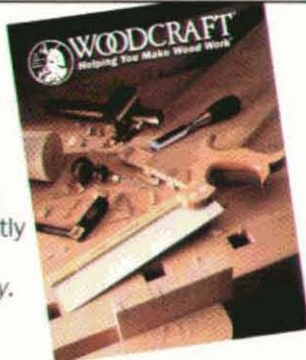
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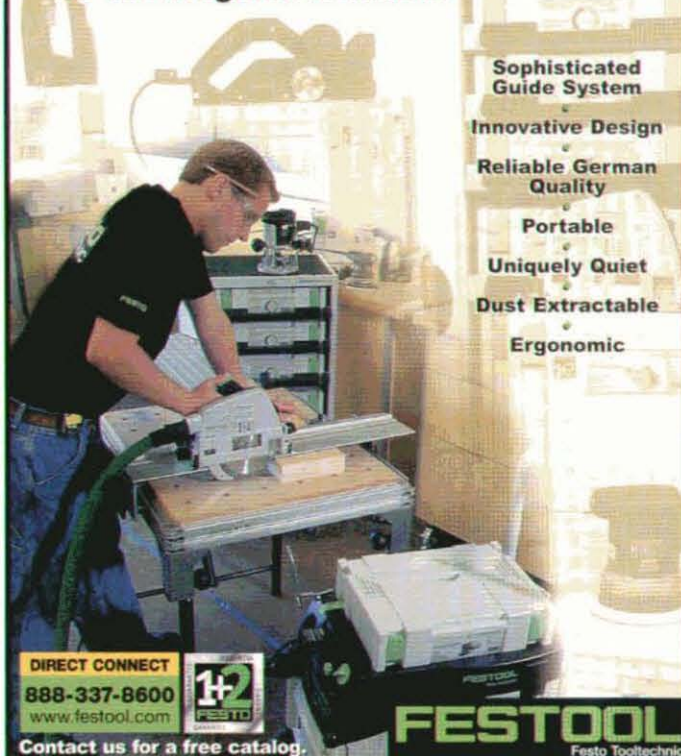
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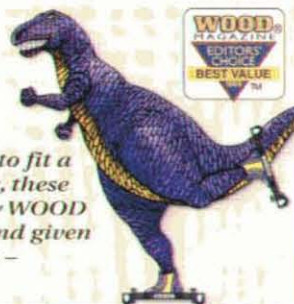
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The patented, adjustable SHOP FOX® Mobile Base shown supporting 5,000 lbs. of sand during testing.

SHOP FOX® HEAVY-DUTY MOBILE BASES



D2057 SHOP FOX® Heavy-Duty Mobile Base Shown with Table Saw

Although rated for machines that weigh between 500 lbs. and 1,200 lbs., the D2058 SHOP FOX® Super Heavy-Duty Mobile Base held 5,000 lbs.!



Available in 3 sizes to fit a variety of machines, these bases were tested by WOOD Magazine editors and given the "Editor's Choice - Best Value" Award.



D2260

MINI MOBILE BASE

Adjusts from 10" x 14" to 17" x 21"

600 lb. capacity

Sugg. Retail \$65⁹⁵



D2057

HEAVY-DUTY MOBILE BASE

Adjusts from 19" x 20" to 29" x 29"

600 lb. capacity

Sugg. Retail \$69⁹⁵



D2058

SUPER HEAVY-DUTY MOBILE BASE

Adjusts from 18" x 24" to 28" x 33"

1200 lb. capacity

Sugg. Retail \$89⁹⁵

D2246 EXTENSION BARS

These 36" extension bars replace the standard length side rails on the D2058 Super Heavy-Duty Mobile Base. This allows the base to be assembled with a minimum capacity of 18" x 34" to a maximum capacity of 28" x 44", suitable for heavier and longer machines such as lathes.

320300658

Sugg. Retail \$29⁹⁵



D2259 EXTENSION KIT

This kit easily bolts on to Models D2260 and D2057 to provide support for an extension table or similar device. Makes the whole machine and extension able to move as one unit. Adjustable for length (up to 44") as well as front to back. Very versatile!

Sugg. Retail \$59⁹⁵

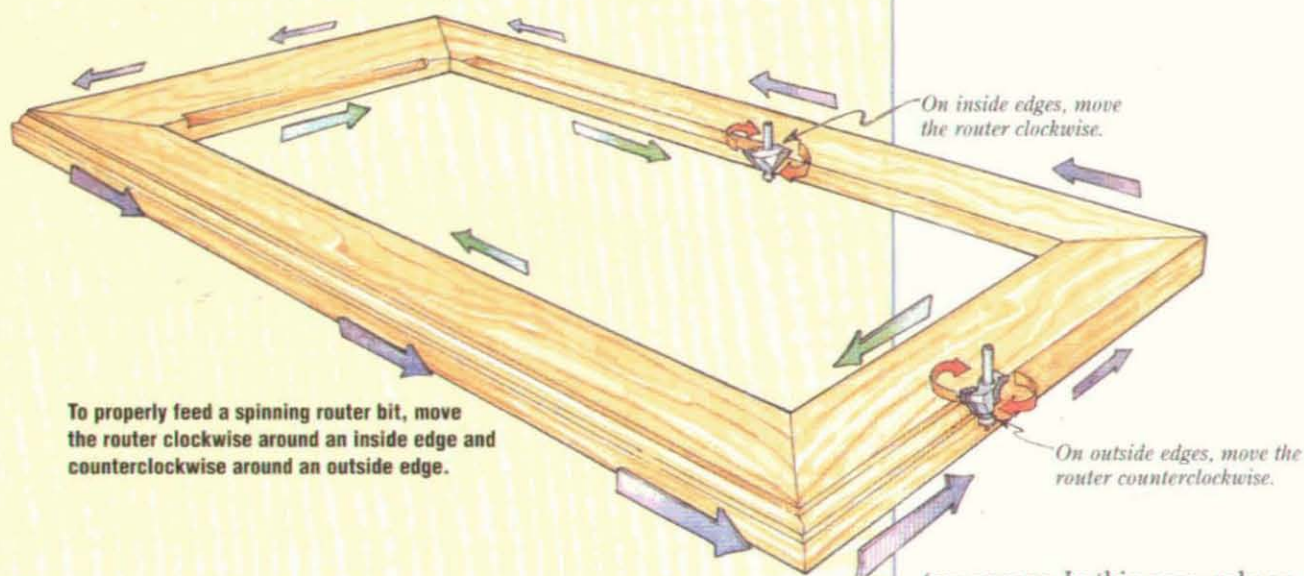


These mobile bases are patented in the U.S.A. with foreign patents pending. Shop Fox® is a Registered Trademark of Woodstock International, Inc.
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Router Basics



To properly feed a spinning router bit, move the router clockwise around an inside edge and counterclockwise around an outside edge.

Your first router can be as confusing as it is exciting. On one hand, you know it's now possible to mill an extraordinary array of decorative profiles and complex joinery. On the other hand, logic dictates that there must be some basic rules to follow before you can safely turn the darn thing on.

Well, you're right. Rule number one is to always use sharp bits. Dull bits ruin the work and are potentially dangerous. Next, make sure those ball bearing guides are properly lubricated and running freely, or you'll have burn marks all over your project. Seat the bit in the collet by pushing it all the way in, then pulling it back out about 1/8". If it's a profile bit, make sure the collet is gripping only the shaft, and not the bottom of the profile. Clean sawdust out of the collet before you install a bit, or you may find the bit works free as you run it.

The illustration above shows the correct (and safest) feed directions when running a router around either an inside or an outside edge.

The illustration at left shows that you should mill across the end grain of a board first, and finish up along the edges. The second cut will eliminate any tearout resulting from the first one. The last



drawing (below left) shows how to use the router's wrenches against each other, to either lock or open the collet with one hand.

This is especially helpful with table-mounted routers where access is limited.



The most important safety rule involves machines mounted upside-down in a table. Never run the workpiece between the cutter and the fence. This is a recipe for disaster: the bit may send

your workpiece flying across the shop ... perhaps accompanied by your fingertips!

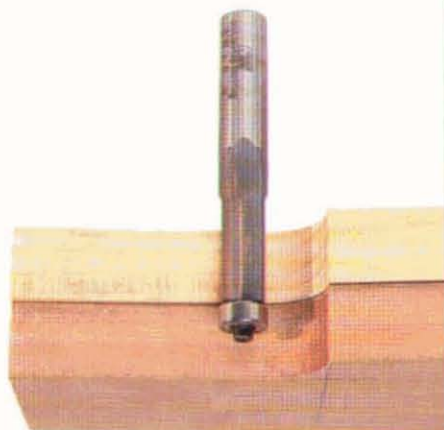
two passes. In this case, rely on a fence rather than the bit's bearing to guide it, or you won't have an accurate second cut: the first pass eliminates the bearing surface for the second cut.)

To produce complex profiles in one pass, bit makers keep introducing larger and larger cutters. The larger the bit is, the more important it becomes to have a variable speed router mounted in a table to run it. Large bits require slower speeds and can actually be very dangerous if they are spun too fast.

Shaping Parts

Template work is one of the router's most powerful processes. Here, you fix a template to a blank, then guide the router around it, cutting the workpiece to a specific shape. You can make countless duplicates of the template. But you need the right bit, either a flush trimmer or a pattern bit.

A flush trimming bit is basically a straight bit with a pilot bearing on the tip, below the cutter. The bearing's diameter matches the bit's cutting diameter. The bearing rides along the template's edge, and any material projecting beyond the edge is removed. In this case, (photo upper right) the template is below the blank.



A flush trimming bit can be used to trim laminate or veneer flush with an edge, or to create identically shaped items, as shown here.

A pattern bit, on the other hand, has a pilot bearing mounted on the shank above the cutter. In this case, the template needs to be above the workpiece.

Some straight bits can be transformed into pattern bits, if you use a bearing with an inside diameter matching the shank diameter and an outside diameter matching the cutting diameter. Slide the bearing onto the shank, and secure it with a stop collar.

With template routing, it's easy to overreach both your router's capability and your own experience. Start out with a 1/2" diameter flush trimmer with 1" long cutters. Down the road, you can add a larger, longer bit. For a pattern bit, simply get a bearing and stop collar for whatever 3/4" straight bit you already own.

Consider a Router Bit Set

Unless you know exactly what you need, it's a good idea (and a sound economic decision) to start or upgrade your collection of router bits by investing in a packaged set.

Every bit vendor I can think of packages bits in sets, and invariably one is a "starter" set. This multi-bit assortment includes joinery and profiling bits, all in a handy box. The specific selection may vary, but usually includes



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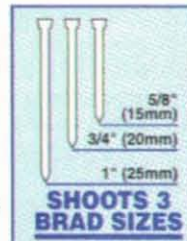
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Today's Shop continues on page 80 ...

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TODAY'S SHOP

Router bits come in diverse shapes and sizes for a multitude of tasks. Their potential is limited only by your imagination. Start with the basics, and in no time you will be creating beautiful moldings and complicated joinery.



three or four straight bits, a rabbeting bit, three or four edge-profile bits, a V-groover, a dovetail bit, and a flush trimming bit. This provides the means to sample the primary categories of router operations. The economy is that the set's price is lower than the aggregate cost of the individual bits. I usually advise first-time buyers to invest as much in bits as they do in the router. This is a good way to make that investment.

Shopping for Bits

To get what I really want, I usually buy bits through mail order catalogs or on the Web. Yes, it requires a bit of self-control, since as much as a week passes between order and delivery. I've survived.

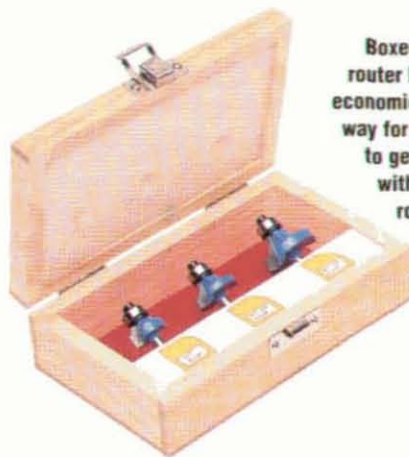
Shopping locally is appealing, but frustrating. Wherever I look, the selection is very limited, mostly because individual retailers like to stick with just one brand. While shopping by mail prevents me from examining the bit before I buy it, the fact is that critical characteristics aren't visible to the naked eye anyway. You can't assess the hardness and quality of the carbide, nor the bit's overall balance, simply by looking at it. If the shank isn't perfectly round, or if

the bit isn't perfectly balanced, it will vibrate. When you cut with it, it will chatter. Vibration is hard on the router, the bit, and the cut. But you can't assess a bit's balance without actually spinning it in your router.

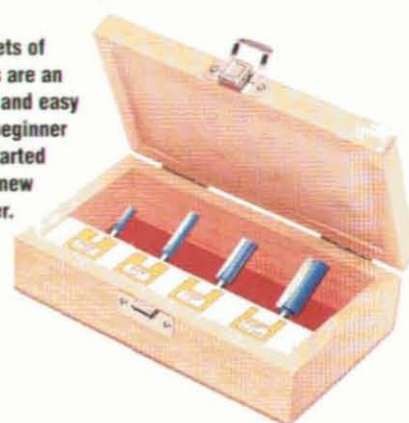
What you can look for are signs of quality: the thickness of the carbide, how evenly it is brazed to the bit body, and the smoothness (and sharpness) of the cutting edge. If the visible aspects concern you, it's likely the invisible ones will, as well.

How do you decide what brand to buy? I go by reputation, price, and my own experience. Buy a brand you see advertised regularly and that comes at a price you can manage. You'll do fine. I've sampled well over a dozen brands, and the truth is that I've gotten very few lemons. Most were replaced by the supplier. So don't procrastinate, and don't agonize. Buy some new bits and make that new router sing you a woodworking song.

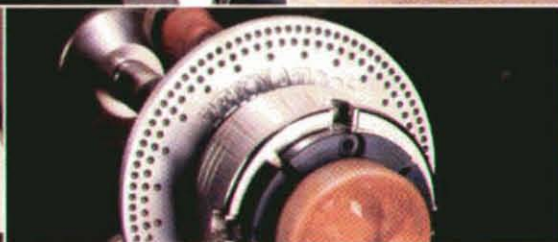
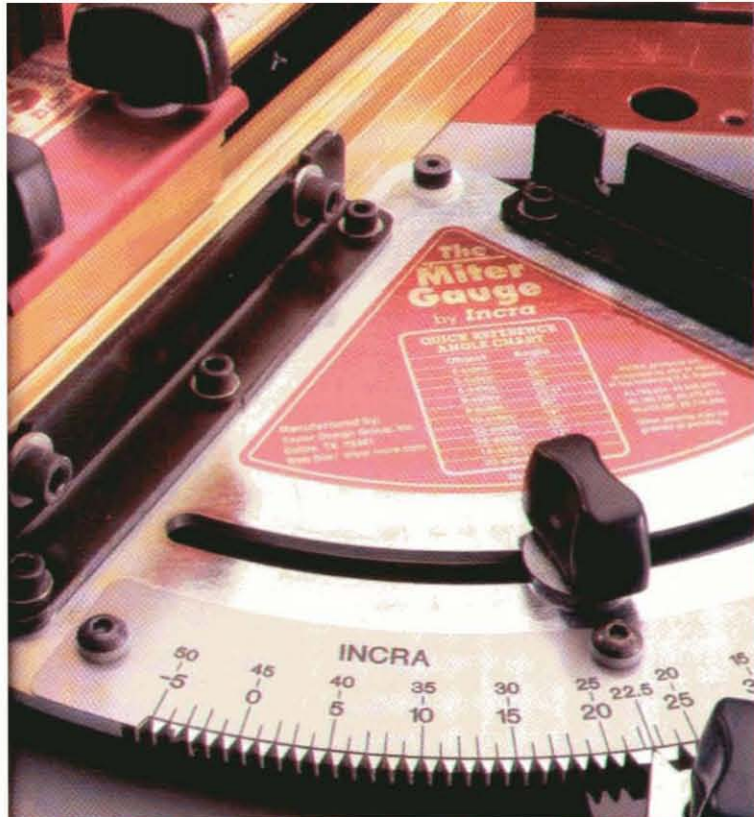
Bill Hylton is an old hand in the shop and the author of Router Magic, published by World Publications, and Woodworking with the Router, published by Reader's Digest.



Boxed sets of router bits are an economical and easy way for a beginner to get started with a new router.



April 2001 Woodworker's Journal



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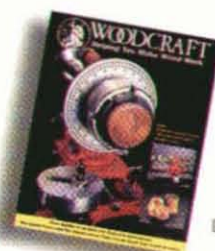
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A New Tool Season

Plunge Router Allows Unique Adjustments

Bosch's new electronic plunge router, the 1619EVS, is the first to have features like a patent pending system to bypass the plunge lock and plunge spring for under-table depth adjustments, as well as an exclusive depth rod system that attaches to the base and allows for easy, precise adjustments on an inverted router.

Designed to perform in either hand-held or table-mount situations, the 1619EVS gets its power from a 3 1/4 HP, 15 amp motor with a variable speed range of 8,000 to 21,000 rpm. A 3 1/4" base opening accepts large bits, while a 7 1/2" wide base provides stability on the work surface. Their Precision Centering design

keeps the bit in the router base on cut lines in jigs and templates regardless of the handle position.

Dual-bearing plunge posts are another exclusive feature of the 1619EVS, which also offers a toolless template guide adjuster and a clear dust extraction hood. Ergonomic features include soft start and soft-grip handles.

Street price for the 1619EVS — a January debut — is between \$319 and \$329. For more info, call 877-267-2499 or visit www.boschtools.com.



Perfect Collector for Small Shops With Lots of Dust



Grizzly's new 4 HP dust collector is for shops that don't have space for the monster models, but still have lots of dust to collect. The G9958 is a single phase, 220 volt model with total suction capacity of 3,560 CFM. The 9" intake port is fitted with a 4x4" manifold that can simultaneously connect to four machines, and the 13" balanced steel fan can handle the dust from all four at once. You can also remove the manifold to connect the dust collector to a central duct system with a 9" main trunk.

The G9958 comes with casters and a magnetic safety switch. Unveiled in January, it's available for an introductory price of \$895.95. For more info, call 800-523-4777 or visit www.grizzly.com.

Makita's Cordless 7 1/4" Circular Saw

To prove that circular saws don't need cords, Makita has introduced the Model BSS730SH cordless circular saw, which they say can crosscut more than fifty 2x10 boards on a single charge. Its 7 1/4", 24 tooth carbide tipped blade is large enough to make 45 degree cuts in 2x material, and has a bevel capacity of 50 degrees, with a positive stop at 45 degrees. Maximum cutting depth at 90 degrees is 2 5/8". The BSS730SH has a shaft lock to aid in fast blade changes — and an electric brake to stop the blade quickly if necessary. Street price is \$478.

For more info, call 800-462-5482 or visit www.makitatools.com.





Store — and Clean — Your Sander While You Work

If you're tired of shutting your sander off every time you need to set it down, Baxter Creek Tool Company has come up with a solution: the Sander Sitter, an "orbital landing pad."

When you need a break, you put your still-running sander — any 5" random orbital disc palm sander — on the Sander Sitter's natural crepe rubber cleaning pad. While you're adjusting your workpiece, or shutting down your sander, the pad

automatically and continuously cleans your sandpaper disc, removing 75 to 80 percent of debris buildup. Martin Black of Baxter Creek says this makes your sandpaper last three or four times longer.

The Sander Sitter's cleaning pad rests in a 5" diameter carousel on a 7" diameter base, all made of polypropylene. Suggested retail price is \$23.99. For more information, call 705-424-9988.



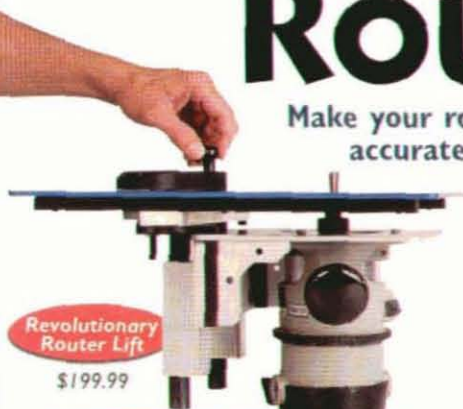
Bite Your Nails With the Claw...

Getting rid of old nails, even embedded or headless ones, should be easier with the Bear Claw® Scraper Bar from Vaughan and Bushnell. You can hammer the nail-pulling end into an embedded nail, and the sharp, gripping edges lock on — even to headless nails. The flat claw minimizes damage to your surface, and the rocker design gives maximum leverage for prying and pulling.

The other end of the 10" forged and tempered steel bar has a broad, thin blade with an extra thin edge that can be used to scrape, cut or pry off molding and other materials. The Bear Claw Scraper Bar sells for \$16.50. For more info, call 815-648-2446 or visit www.vaughanmfg.com.

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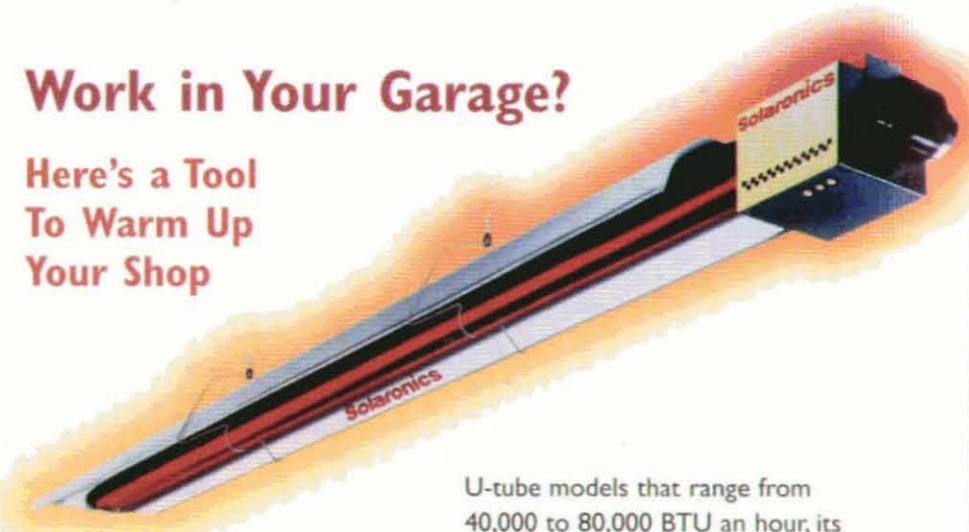
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WHAT'S IN STORE

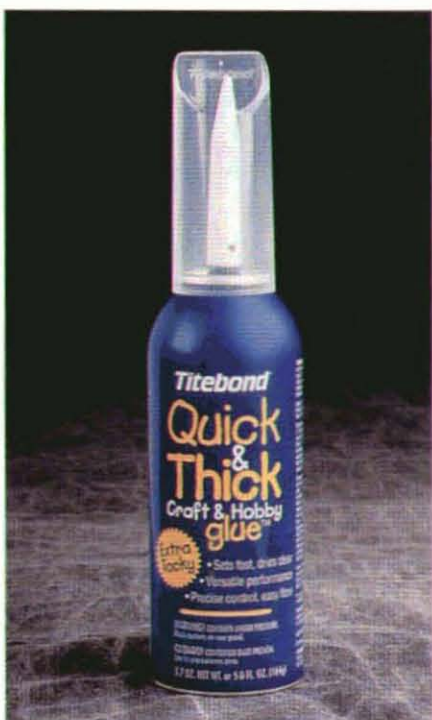
Work in Your Garage?

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If you spend your winters making sawdust in your garage, you're going to love this new product from Solaronics, Inc. The Residential Garage Heater converts natural gas or LP/propane to infra-red heat. Tom Lester, Solaronics' vice president of sales and marketing, says "the Residential Garage Heater saves up to 75 percent of fuel costs over conventional heaters that just blow warm air." Available in straight and

U-tube models that range from 40,000 to 80,000 BTU an hour; its design certified by both the American and Canadian Gas Associations. Rotating an aluminum reflector from zero to 45 degrees directs heat where needed. The Residential Garage Heater mounts on the ceiling with a chain system and operates with direct spark ignition — no pilot light — and 100 percent safety shut-off. Retail price is \$995. For more information, call 800-223-5335 or visit them on the web at www.solaronicsusa.com.



Thick Glue Stays Put

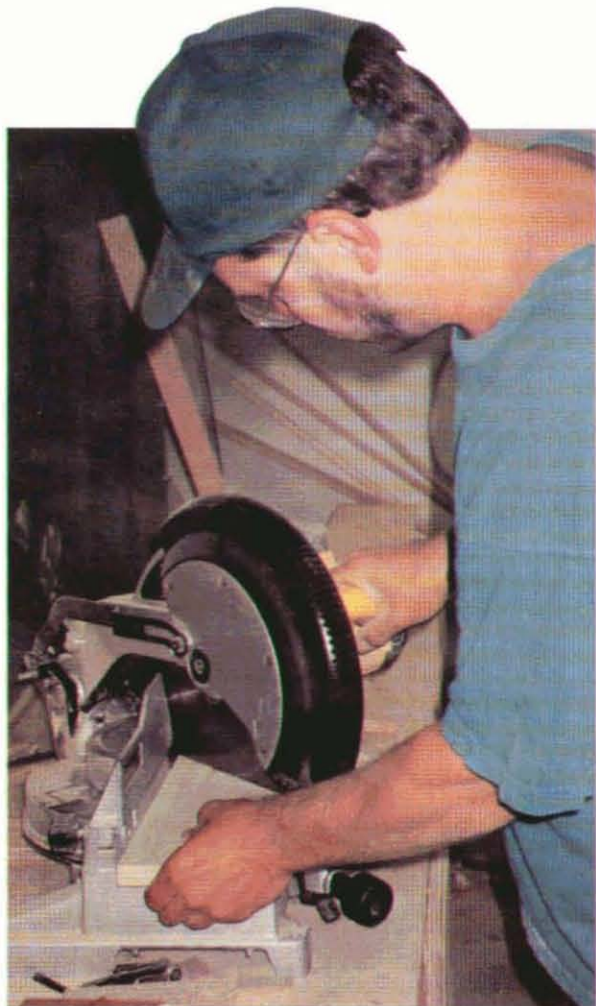
Titebond Quick & Thick Craft & Hobby Glue™ displays a strong initial tack on wood — as well as other porous and semi-porous materials like leather and cloth — and dries clear, with a strong bond. A self-dispensing, no-mess applicator is useful for quick application. Franklin International's product also sports safety features such as a complete absence of CFS's and water clean-up. Quick & Thick Craft & Hobby Glue is nontoxic. Estimated price is \$5.99. For more information, call 800-347-4583 or visit them at www.titebond.com.

Ceramic Blades: Cleaner, Faster

Ceramic tipped saw blades will be the wave of the future if Tom Walz, CEO of Carbide Processors, has his way. Tom claims the "cermets" they manufacture can cut cleaner and faster than carbide and will stay sharp longer.

According to Tom, the easier cuts of cermets increase the productivity of battery-operated tools, and they work well in table saws. Cermets typically run about 15 decibels quieter than carbide tipped saws, and stay cool in applications where carbide gets hot.

Cermet blades, on average, require sharpening twice a year and retipping annually. Each saw is custom built, with price depending on diameter and tooth count; it's typically about twice the price of a carbide-tipped blade. *For more info, call 800-346-8274 or visit Carbide Processors at www.carbideprocessors.com.*



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Lock in Your Miter Angle

The Sure-Loc™ miter gauge and Tru-Trac™ miter bar from Rockler Woodworking and Hardware lock in your angle and ensure exact repeatability, says vice president of product development Steve Krohmer. Noting that the miter bar portion of Sure-Loc offers a snug ride along the entire length of both T-slots and standard tracks, he continued, "A precision miter gauge in a sloppy miter slot is no better than the throwaway miter gauge that came with your saw."

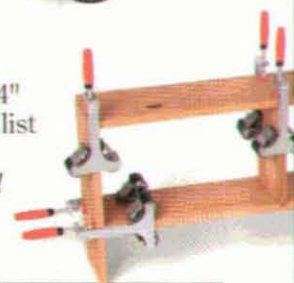
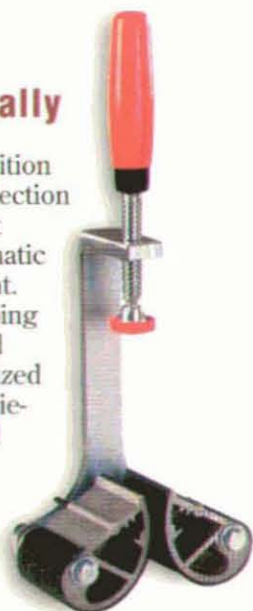


Both the bar and the miter gauge are precision machined with segmented rings of interlocking teeth, ensuring accuracy to within less than 3/100 of a degree. The Tru-Trace dual bar system expands to fit any track. The Sure-Loc and Tru-Trac, sold together, are \$89.99.

For more info, call 800-279-4441 or visit the web site www.rockler.com.

Clamp Laterally

Gross Stabil's addition to your clamp collection is the APS contact clamp, with automatic tension adjustment. Suitable for clamping shelves, stairs and frames, its galvanized steel frame with die-cast spring-loaded rotating heads is good for lateral clamping: a few turns of the handle releases powerful pressure. It's designed to hold materials from 1/4" to 3 1/4". Suggested list price is \$64.10. For more info, call 800-671-0838.



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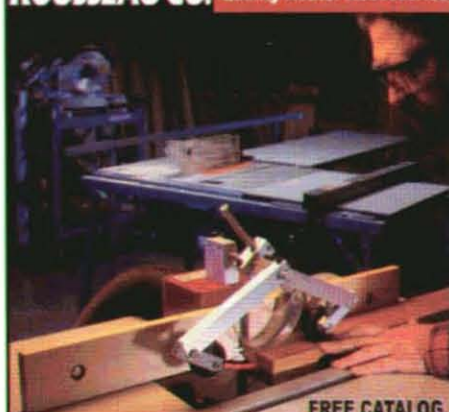


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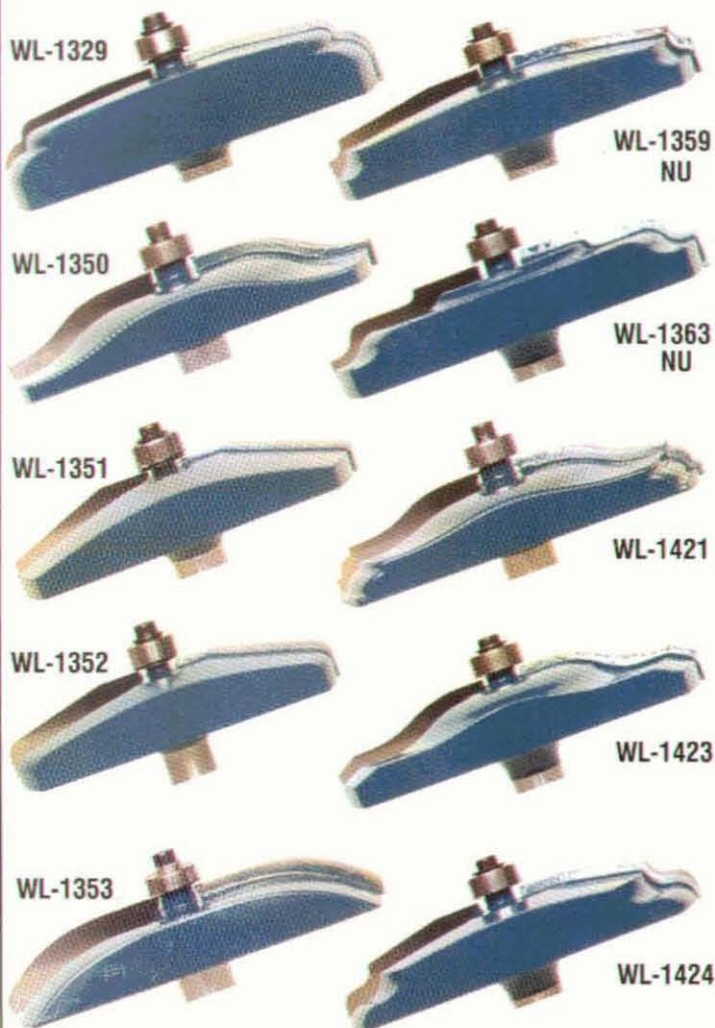
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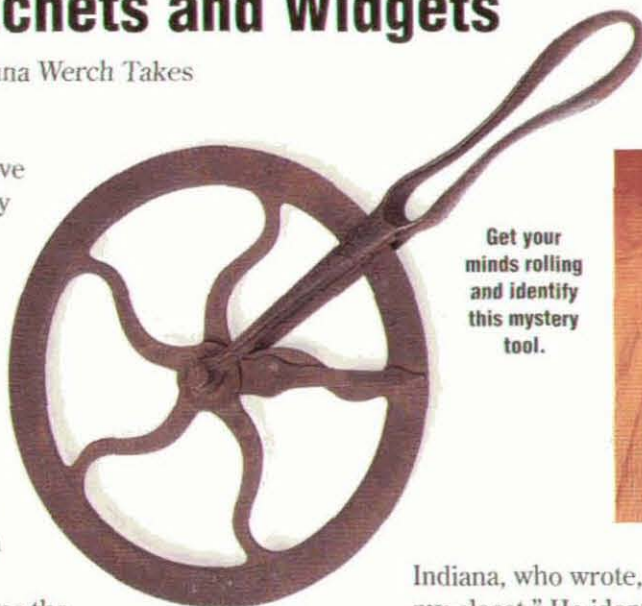
Those of you who have enjoyed the mystery tools found in *Stumpers* each issue may be pondering another mystery with this magazine: why has the department moved to the back page? The answer: we merged *End Grain* (which used to occupy this spot) with our *Letters* department.

Stumpers, we decided, was the perfect choice for our last page — something fun for you to chew on while awaiting your next issue!

The tool that ushers *Stumpers* into its new slot is a special one for me — since it's mine. The wheel with a handle came out of a 50-year hibernation in a family basement last summer. After cleaning some of the rust off, I confirmed that the markings on the wheel separate it into 24 divisions of one inch. An arrow points to the zero (or 24) inch mark. I don't know if it was bolted there originally, or if it just quit moving some time over the past century. A manufacturer's mark does appear on the back of the tool. The first word is worn off, but the rest of it says, "Russell Mfg Co, Greenfield, Mass." Anyone want to take this info and roll with it? Remember, you might just win a shop full of clamps for your efforts!

While we're waiting for your answers, we'll look back at an earlier mystery. In our *December 2000* issue, we featured a tool that **Nordy Rockler** of Minneapolis, Minnesota discovered when cleaning out a closet. It didn't take readers long to get around to writing us about it.

One of the first comments out of the mailbag was from antique tool collector **Tom Culp** of Portage,



Get your minds rolling and identify this mystery tool.



Indiana, who wrote, "I wish I could find one of these in my closet." He identified it as a British made rounding plane. The blade on Nordy's tool does say "Summers Varvill, Ebor Works, York." Quite right, mate.

Of course, woodworkers in the States used the rounding plane, too. **Cornelius Daly, Sr.** of Clifton, New Jersey certainly did, making 2½" poles for rake handles. And just how did Cornelius go about this process? "Basically, it is the same principle used in a pencil sharpener, except the end product is a thick dowel instead of a sharp point," explained **David Hillner** of Wichita Falls, Texas.

Randy Lloyd of Idaho Falls, Idaho said the plane's original purpose was for turning tenons on chair legs, while **Robert C. Haugsten** of Santa Rosa, California said it was to repair wagon wheel spokes. **Jim Fergusson** of Calgary, Alberta told us the curve on the cutting blade was included "so the shoulder of the tenon is curved, not square, to eliminate a possible stress point."

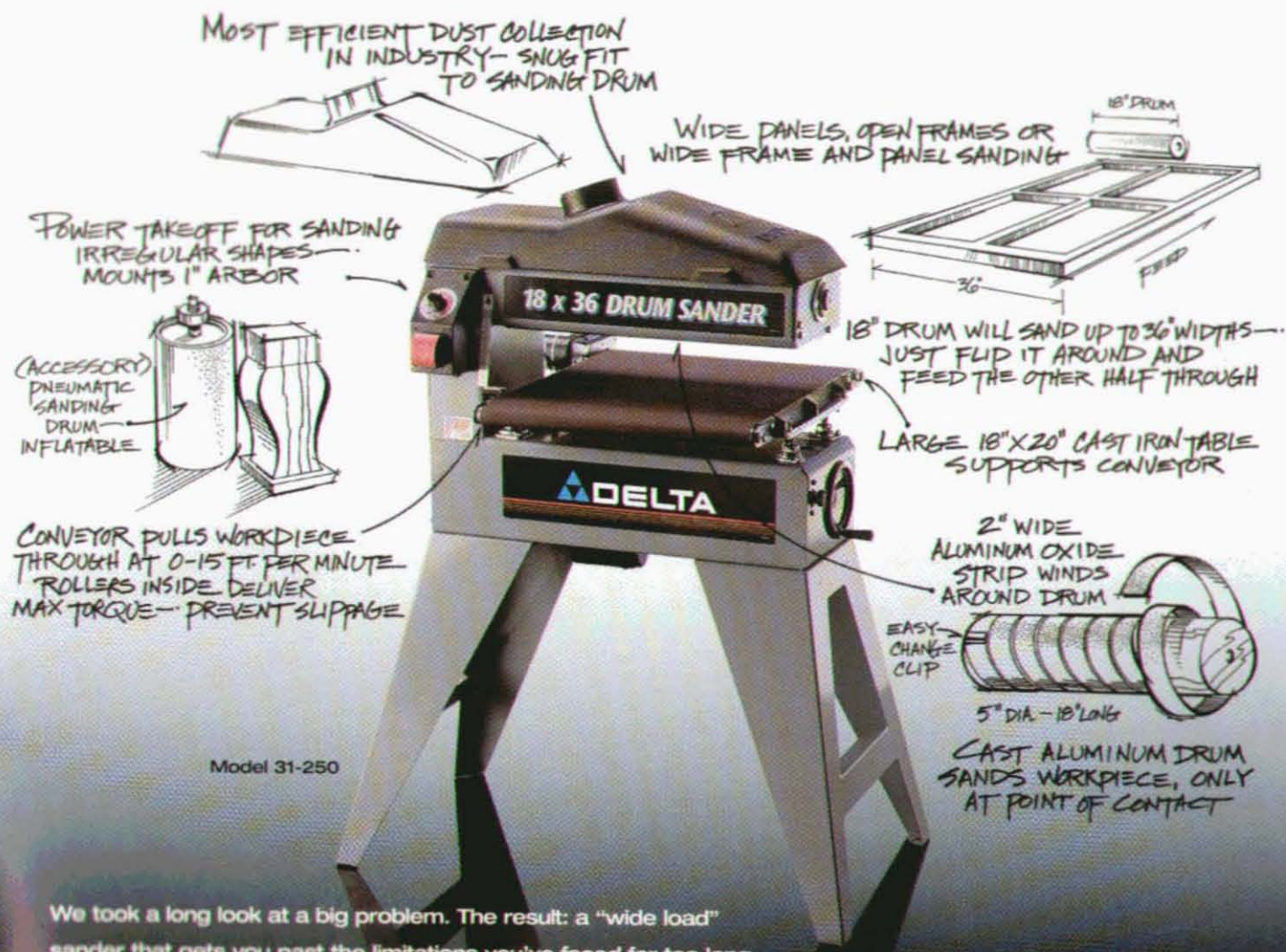
And finally, as we heard from **David Rembecki** of Fuquay-Varina, North Carolina, when this tool's not called a rounding plane, it's sometimes known as a "witchet."

WINNER! For taking the time to respond to *Stumpers*, **Bob Nadeau** of South Portland, Maine wins a collection of American Tool's Quick Grip clamps. We toss all the *Stumpers* letters into a hat to select a winner. If you have a question or answer, send it to *Stumpers* Dept., *Woodworker's Journal*, P.O. Box 261, Medina, Minnesota 55340. Or send us e-mail: jtakes@woodworkersjournal.com



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