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November 1999 #111

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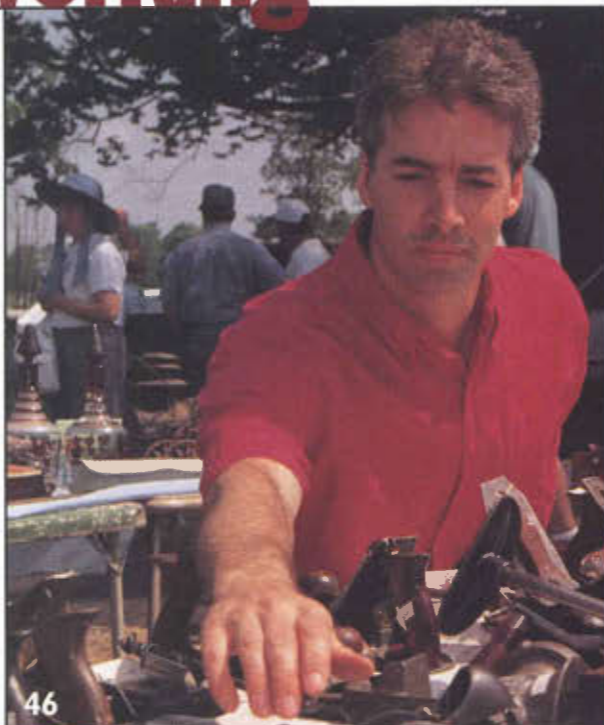
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By Glen Huey

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For some time we've tinkered around with this design for a sliding miter sled. You're not going to find a better design or a better price: about \$35. We also show you how to build a radius-cutting jig for your router.

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If your media center doesn't need to cover an entire wall and have room for those two reel-to-reel units in your basement, then we've got the project for you. It's simple, stylish and surprisingly roomy for modern components.

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Think of what you could do with your guest room if you didn't have to put a bed in there. This Murphy bed design gives you a fold-up sleeping space plus tons of storage in the bookshelves and cabinets.

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ON THE COVER

Editor and Publisher Steve Shanesy tries out our shop's new miter sled. This inexpensive and fully adjustable jig allows you to make dead-on crosscuts and miters.



Cover photo by Al Parrish

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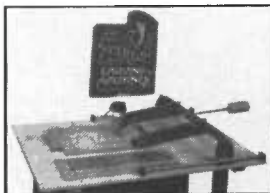
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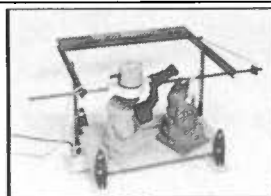
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Circle #112 on Resource Directory Coupon

Art vs. Craft

Studio furniture is not the highest achievement of woodworking, though galleries want you to believe that.

There are people in the art world with opinions I respect who believe there's no distinction between art and craft. If I understand them, they say there's no need to draw lines separating a fine piece of furniture from a masterful painting. I've always held the view that fine art is painting or drawing, music, sculpture and dance. Everything else is basically craft work.

I don't want to argue what makes art, when it is craft, or when or how craft becomes art. Frankly, I don't know enough about the subject, or care for that matter, to get worked up about it.

I do, however, get exercised when I walk into a gallery or museum and see some goofy looking piece of woodwork with an outrageous price tag, and the item is labeled as "art" or "studio" furniture. I don't begrudge the maker, or shall I say designer/craftsman, the right to make something and sell it for a high price. On the contrary, I celebrate every buck a woodworker gets for his work, which is usually not enough.

What bothers me are the items chosen by museums and galleries, and the effect those choices have on everyday woodworkers. By choosing to display "art" and "studio" furniture, museums and gallery owners are sending a message that these items represent the best work being done today by furniture-making craftsmen. In effect, they are saying that aspiring woodworkers should look on these objects as examples of what great woodworking is, because its value is so high. And conversely, if you're not heading down this track, there's no way your work will be recognized as great work.

I say that's a bunch of hooley.

Art furniture often uses a visual trick, sometimes quite clever, to make itself interesting and unique. Frequently, the trick is at the expense of the usefulness of the original object. For example, a straight chair might be made with only three legs or with a broken fourth leg, rendering the

piece useless as a chair but making a statement about something.

Why is it rare for a beautifully designed chair that's built on sound woodworking principles with a gorgeous finish to qualify for a spot in a museum or gallery? Why can't an exquisite contemporary desk with interesting wood and Grade A joinery be part of a typical show? Why can't purposeful woodwork be placed on the same pedestal as those which must make a statement at the cost of their usefulness?

Museum curators and gallery owners should simply call the art furniture what it is (a form of sculpture), and also show well-executed craft objects. Then we could lose the criterion of cleverness or trickery and focus on craft itself. Skilled woodworkers who have reached the pinnacle of the craft could show work, even if designed by others, that represented the ultimate rendering of the state of the craft. It would be work all woodworkers could respect, admire and aspire to, and the public might become educated about what great woodworking is today.

Although not always, art or studio furniture is often produced by designer/craftsman who are obviously more concerned with design than craftsmanship. If you look closely at the work, you often see the most fundamental principles of woodworking construction ignored. This too lowers the expectation of the craftsmanship of woodworking. Even in the fine art world, most highly regarded work is technically well done. Why should examples of woodworking be any less so?

There are some art furniture makers who never compromise craft, who honed their woodworking skills and ply their trade in the art market. But can't we please develop a way to evaluate what represents the best examples of our craft today? **PW**

Steve Shanesy

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Editorial on Lumber Prices Stirs Debate

Wood Store Manager Says Retail Lumber Prices are Justified

I am the manager of a retail woodworkers' store, and I hardly know where to begin in response to your editorial: "Why You're Paying Too Much for Lumber" (July 1999 #109). First of all, how can you compare buying green, ungraded lumber direct from a Mom and Pop sawmill like the Carriers with selecting from a wide variety of graded, kiln-dried, surfaced and straight-lined boards in a store located within a few miles of your home? I'm sure I can drive out to the country and buy a gallon of unpasteurized milk from a farmer for 25 cents; does that mean I'm paying too much for my milk at Kroger?

You make it sound as though the woodworker who shops retail is getting ripped off. You ask, rhetorically, "Is the mark-up justified?... Does it add that much?... Do the retail woodworking supply stores have that much extra overhead than the commercial job shopper?"

The answer to all these questions is "yes." I would be happy to sit down with you and go over my books and show you what I pay in rent per square foot, inventory costs, advertising, employee payroll/benefits, expenses (my light bulb bill!), janitorial, utilities, etc. I have to maintain three employees to sell a few hundred board feet per day (the average warehouse employee can pull 1,000s of board feet per day.) My employees have to be able to talk knowledgeably about every aspect of woodworking and provide expert consultation to customers; we provide cutting services on lumber and plywood; you can select from up to seven different thickness of 50 different species of wood. The type of sawmill you mentioned cannot come even close to handling the volume and type of walk-in and call-in business we get every day.

We spend about 20 hours a week just putting tags on each and every board, indicating the board footage, specie and thickness. And we'll still sell you part of that board at no extra charge.

We encourage woodworkers shopping around and taking advantage of whatever deal they can find. In fact, we ourselves will sell to absolutely anybody at the

wholesale level, all they have to do is order 100 board feet.

The question here is—given that it takes a retail markup to keep a store like ours open—do the 5,000-6,000 customers who support us want to see us stay open, or would they rather see us close up (that's the option) so they can shop as you propose?

Jeff Arnold
Cincinnati, Ohio

manager of Paxton Woodcrafters' Store

Every merchant has a business model which, if successful, is supposed to deliver as much profit as possible after covering labor and overhead. Some businesses elect a full retail model and incur much higher overhead. These higher costs are reflected in their prices. Others take the discount approach, keep costs down, and sell similar merchandise for less. Usually, competition in the marketplace has an enormous impact on not only prices, but the success of one business model over another. As most readers would agree, over-competition is not something you would associate with retail hardwood lumber. My editorial urged readers who are concerned about the costs of hardwood lumber to shop around for the best prices and to understand that personal inconvenience, such as driving some distance, could save them a bundle. Also, in a marketplace that lacks any real competition, the onus is on the buyer to find the best deal he can. And part of getting the best deal is having some knowledge about how the market works. I stand behind my editorial.

—Steve Shanesy, editor and publisher

Reader Says Editorial on Lumber Prices Opened His Eyes

Thanks for your editorial, "Why You're Paying Too Much for Lumber" (July 1999 #109). I had a feeling that the pricing scheme of wood suppliers was skewed against the Mr. Garage woodworker, but I really never could put some numbers to my suspicions. I appreciated your candor.

I am a retired teacher who has collected tools, plan ideas, etc., for more than 40 years so that I could use them when I retired. I planned to use my free time to build all sorts of fine furniture from this collec-

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Popular Woodworking welcomes letters from readers with questions or comments about the magazine or woodworking in general. We try to respond to all correspondence. Published letters may be edited for length or style. All letters become the property of *Popular Woodworking*.

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tion. Upon retiring, I built a large shop in my backyard and started to look for raw material to build with. I was horrified at the prices of some of the local walnut: \$5 to \$6. Cherry for \$6 etc. It looked like Jesse James without a gun! On a fixed income, my efforts were limited by my ability to reluctantly pay these robbery prices.

I suspected that there were less expensive sources, but could not put my fingers on it in my area. I have been fortunate to be able to purchase a few pieces at a good price at some auctions, but this is an unreliable supply.

After reading your editorial, I wondered why it might not be possible for a magazine such as *Popular Woodworking* to serve as a clearing house for getting us poor folk, and some suppliers who are willing to supply us at more reasonable prices, acquainted. Perhaps a listing of sawmills that are willing to sell rough lumber would be helpful. I realize that it is the advertisers that keep your magazine solvent, and this might be an affront to them, but we need help too. Your editorial gave me hope!

John E. Kastl
Lincoln, Nebraska

How Can I Prevent My Table Tops From Cupping?

I am using cherry to make glued-up table tops for a small dining table and matching coffee table. Question: how wide can I rip the boards for gluing up and not have

Continued on page 10

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Continued from page 8

a big cupping problem? One will be 36" wide and the other 24". Can I get away with using boards wider than 4"? Thanks.

Mike Lane
Middletown, Ohio

When I was a journeymen cabinetmaker, I mainly used solid wood as trim for plywood and veneer work. When I went to work for a 18th-century reproduction furniture maker, I got a serious education in the use of solid wood. We mainly made tables at our shop, and (with serious historical research) would try to make the widest tables out of the fewest boards that we could. That means, as the car commercial goes, wider is better! We would routinely build 36" curly maple tops with only five or six boards in them. That said, the tops were screwed down to two battens and through the edge of the apron using pocket holes. In three years, I never saw a table come back because of any cupping problems. Our only limitation was the width of our planer.

—Jim Stuard, associate editor

I'm Building the Photo Screen and Need Some Help

I am building the photo screen featured in your March 1999 issue for my wife's birthday. She thought that decorative moulding for the frames would look better than the simple roundover, so I made some fluted molding. It is 1/8" larger than what you have specified. My concern is how to make the frame the right size for the picture. What should I add to the picture size to get the correct inside dimension? Please help.

Also, I am wondering with the dimensions you set for the plexi (8 1/4" x 10 1/4"), won't the picture fall to the bottom of the frame once you stand the screen up? Please help again. I am looking forward to any assistance you can provide.

Terry Larkin
Andover, Minnesota

Fear not. Depending on the exact size of the photo, you shouldn't have any "slippage" problems. As long as you make the rabbet on the inside of the frame moulding large enough to cover any slop.

Generally, I make the moulding rabbet about 1/4" by the thickness of the covering glass and any filler you want to use. Start measuring your frame size from the inside of the moulding. Add about 1/8" to 1/16" over the picture size. It helps if all the photos are close to the same size, too. If the picture is going to be close in size, try mounting it to cardboard, centered on the frame opening. This way, you'll get no movement.

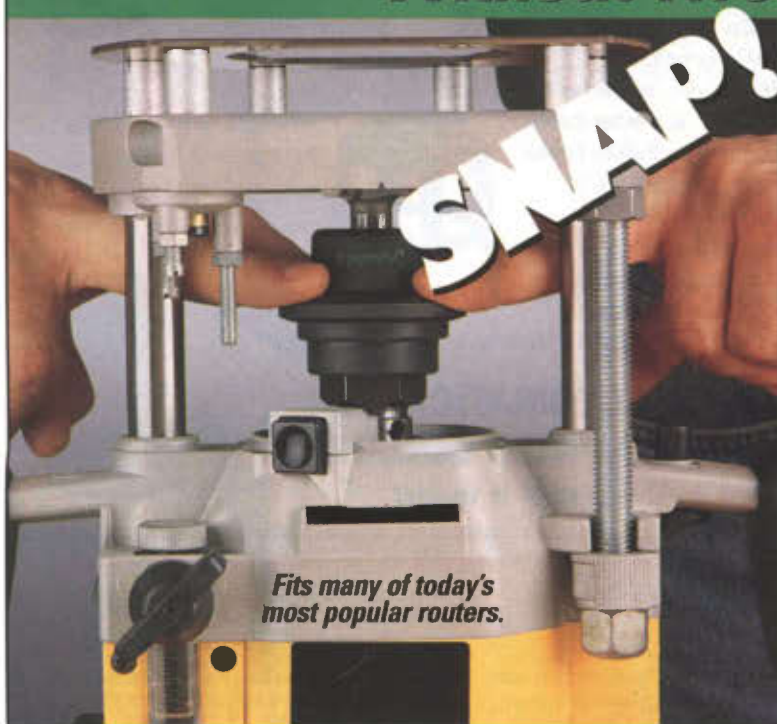
—Jim Stuard, associate editor

The Debate On Horsepower in Power Tools Continues

After our story explaining how motors in woodworking machines work ("What You Absolutely Must Know About Motors" March 1999 #107) appeared, one reader wondered how his new shop vacuum could have so much horsepower. The following is his letter to the manufacturer of his vacuum and the company's response. One note: as far as we know, nearly all manufacturers of shop vacuums use the same sort of horsepower rating system; Ridgid is not alone.

Continued on page 13

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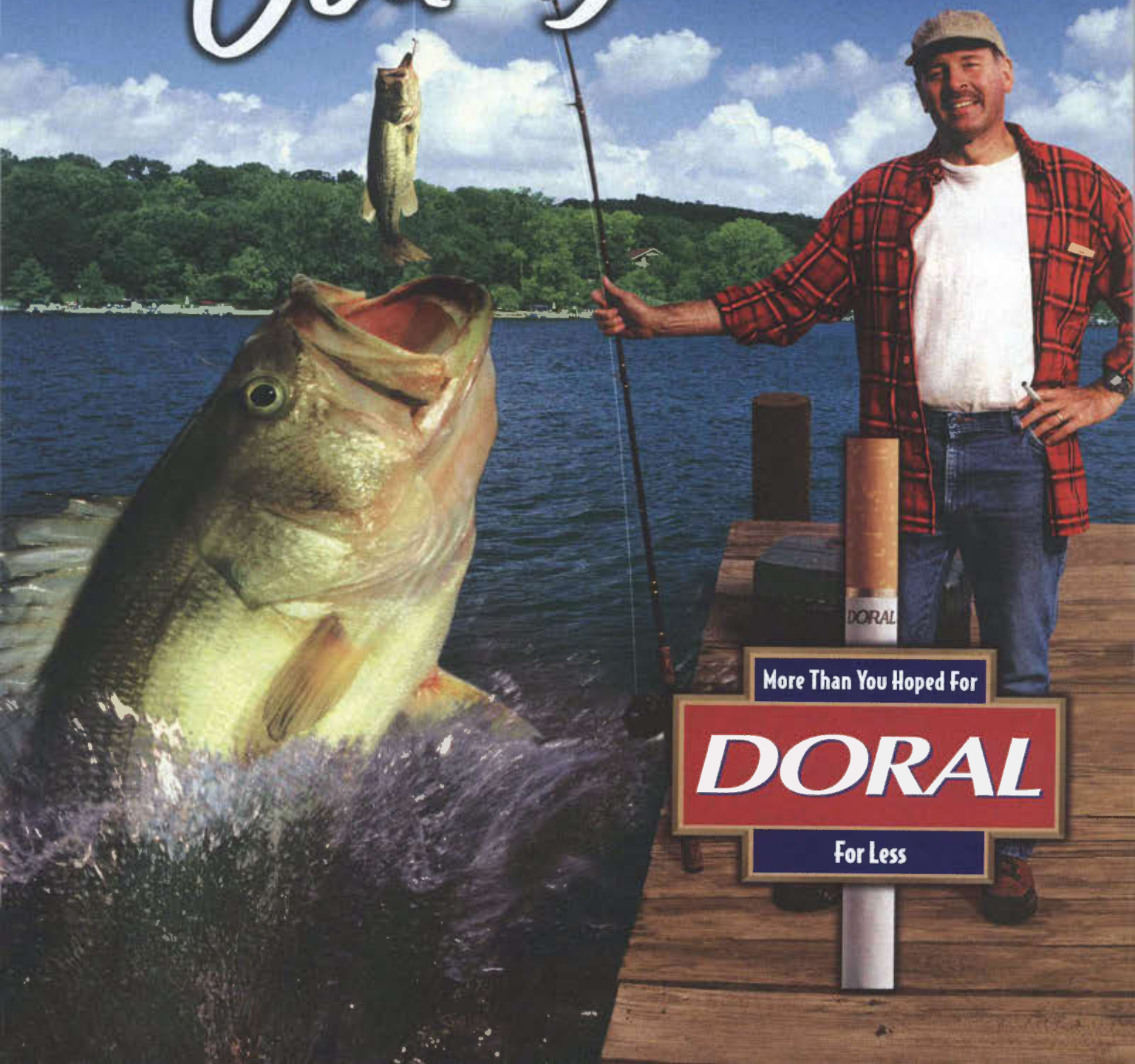
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Continued from page 10

Can My Shop Vacuum Really Be This Powerful?

I don't want to be seen as a goofball, but I believe the advertisement for 6.25 peak horsepower for my recently purchased Ridgid shop vacuum seems fraudulent. We know from the first law of thermodynamics that when you transfer energy into a system and that energy is transformed into another form (in this case electrical energy is transformed into mechanical energy), the quantity of energy is degraded.

In my case, let us assume we have a 120-volt supply with a 20-amp breaker. Let us further assume the vac draws the full 20-amp limit, which is highly unlikely but represents the maximum condition in a residential shop. The amount of energy transferred into the system is $120 \times 20 = 2,400$ watts or $(2,400/746)$ 3.2 horsepower. Even if we were able to obtain 100 percent transformation of energy, it is still far from 6.25 horsepower advertised for this vac. If the Ridgid Tool Co. has a device that increases the output power over what one puts into a system, it should have announced its discovery to the world as it defies theoretical laws.

I suppose Ridgid could test the motor with a higher voltage and obtain more horsepower, but to imply that Joe Average Woodworker can obtain that horsepower is false. I think someone should call Ridgid on this. I'll be happy to apologize if someone finds a flaw in my reasoning.

Tom Mueller
Orinda, California

Ridgid Responds

In response to the letter that you sent to *Popular Woodworking* and to Ridgid Tool Co., I would like to offer the following.

The term "peak horsepower" is a rating term that is used on many universal motor products. "Peak horsepower" should not be utilized interchangeably with "horsepower" as you have done in your letter. The testing of motors to determine "peak horsepower" is not done under artificially high voltage as you suggested, but with shop-rated voltage conditions. This method of testing is used to provide a relative ranking within a family of products like wet/dry vacs. This rating is clear to

the average customer; i.e. 6.25 peak horsepower has more work capacity than 3.25 peak horsepower. It is far less complex than the specifications of an industrial customer who has a defined application; i.e. amperage draw, cubic feet per minute, operating speed, hose length, nozzle configuration, etc. I trust you can relate to the differences.

Most importantly in all of this is how satisfied you are with your 6.25 peak horsepower vac's performance. We feel that this product is an outstanding value for the customer and it reflects a level of product that has built Ridgid Tool's 75 years of excellence.

Paul W. Gress
Vice President Engineering
Ridgid Tool Co.

What Can I Do About Rust On My Table Saw?

I recently purchased a Delta Grand Edition Contractor's saw (a great value with excellent features). However, like a dummy, I accidentally left a damp cloth on the saw and later noticed a rusty film. I initially sanded the affected area with 150 grit sandpaper, which left unsightly scuff marks. After the rusty film reappeared, I used steel wool. To no avail, the film reappeared. Someone suggested I use naval jelly. What can I do to remove both the rusty film and the unsightly scuff marks left by the sandpaper? One last thing: I would like to commend Delta on its excellent service. I called on two occasions, once for missing hardware and after noticing my blade was out of round. The company promptly corrected both problems by shipping overnight both parts. Your magazine has helped me tremendously with my new-found hobby.

Lisa Hribar
Cleveland, Ohio

Getting a rust spot on a new table saw is akin to getting the first dent in a new car. It's painful, but it's going to happen. I recently restored a rusty Atlas drill press back to factory condition. I removed the rust from the machine's table with 220-grit sandpaper on a random orbit sander. Then I treated the parts with SlipIt-brand lubricant. Four months after the restoration, the rust has not reappeared.

—Christopher Schwarz, managing editor

Continued on page 14

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LETTERS

Continued from page 13

Not All Your Readers Are on the Internet, So Be Careful

I received my first issue of *Popular Woodworking* today and must say I was a little disappointed in something. You, as well as other woodworking magazines that I have purchased, assume every household has an up-to-date computer and a phone. I have a Commodore 64 computer and no phone. I got rid of the phone because the only people who called me were sales people. (I am a single 43-year-old male.)

I have seen some things that I would like to get more information on, but when I saw that you had to log on to the internet it ticked me off. I would much rather spend my money on lumber and tools than lay out \$1,600 for a new computer and \$20 per month for internet services. Not to mention another \$20 per month for a phone. Never assume anything. A lot of companies with ads in your magazine are losing sales because they give an internet address but not a postal address. Please pass this on to your advertisers.

Alden Allison
Muskegon, Michigan

We understand that not all of our readers are online, so we make sure the plans in the magazine stand on their own. You don't need to visit our website to build any of our projects. Plus, you can use the Resource Directory card at the back of the magazine to request information from every advertiser in our magazine. If you don't have a computer but are interested in visiting woodworking internet sites, many local libraries of them have computer terminals you can use for free.

Clarification

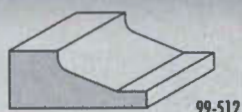
In the September 1999 (#110) story about restoring old handplanes, a sentence in the story about using electrolysis to remove rust contradicted the caption. The story said to use baking powder in the water solution; the caption said to use baking soda. Baking soda is the correct material. Also, since the story was published, the internet address for more information on electrolysis has changed. The new address is: members.xoom.com/nlindsey/restoration/Electrolysis/Electrolysis.htm PW

another Revolution...

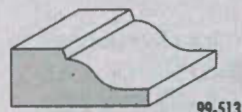


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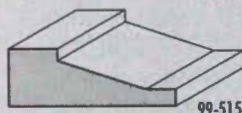
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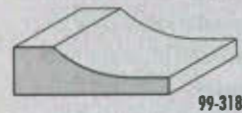
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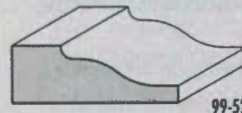
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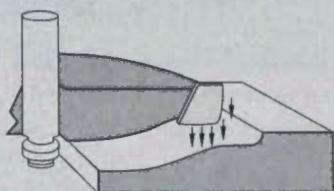


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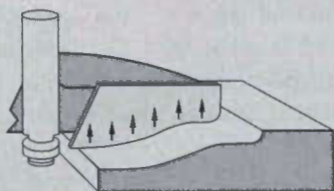


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The Folly of Food-Safe Finishes

Despite what you've read elsewhere, almost every wood finish should be considered food-safe.

It's a shame, but many woodworkers worry about which finish to use on objects that will come into contact with food or children's mouths. The reason for the worry is that woodworkers have been conditioned by several decades of articles in woodworking magazines to believe that ordinary finishes like boiled linseed oil, alkyd varnish and polyurethane varnish may leach poisonous ingredients like metallic driers. And other finishes, like lacquer, catalyzed (two-part) finishes, shellac and water-based finishes, may leach poisonous solvent.

The idea that some finishes are harmful is reinforced by a few manufacturers who label their finishes food- or salad-bowl safe, which implies that other finishes are not.

A Non-Issue

The shame for woodworkers is that a lot of energy is spent on the issue of food safeness when none is warranted. Food safeness is a non-issue because there's no evidence of any problem. So far as we know, all finishes are safe to eat off of, and safe for children to chew on, once the finish has fully cured (the rule of thumb being 30 days).

Think About It

- Have you ever heard or read of anyone, child or adult, being poisoned from contact with a cured, non-pigmented finish?
- Is it likely that any finish could be sold in paint stores or home centers without a warning if the finish were known to be dangerous for food or mouth contact? (Paint store clerks are rarely even aware that there might be an issue.)
- If there were any evidence that common wood finishes were unsafe for food or mouth contact, why is no mention made on the MSDS (material safety data sheets)? All unsafe uses of products are required by law to be listed on these forms, along with information about treatments for resulting health problems.



Check out the label on your finishes. Likely it says something about how you shouldn't drink the product and to induce vomiting if you do. But does the label say anything about how it shouldn't be used on items that will come in contact with food? We haven't found a label that does.

- Finally, does it make any sense that commonly available oils and varnishes that contain driers and solvents could be a health risk while the so-called "food safe" oils and varnishes, *which contain the same driers and solvents*, aren't a problem? (These finishes wouldn't cure without the driers and would be too thick without the solvents.)

I want to make clear that I'm not saying that all finishes are food safe — we can't be absolutely sure about the safety of any curing finish. I'm saying that there is no evidence of any common wood finish being unsafe for food or mouth contact once it has fully cured, so a distinction between food-safe and non-food-safe is speculative.

For those who would then reply, "Well, there's no point in taking a chance," I would say that we take chances everyday with almost everything we come in con-

tact with. To rule out certain finishes when there's no evidence of a problem is unreasonable and arbitrary.

The FDA

A lot of the discussion about food safeness centers on what the Food and Drug Administration (FDA) allows. The FDA doesn't approve products, it regulates them. And it has published a set of regulations for establishing the food safeness of finishes. These regulations are contained in the Code of Federal Regulations, Title 21, Part 175, which you can find at larger public and university libraries.

There are two conditions for meeting FDA regulations.

- First, the finish must be made from among the raw materials listed on nine double-columned pages (additional ingredients can

Continued on page 18

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FLEXNER ON FINISHING

Continued from page 16

be added by a petition method). This list includes every oil, resin, drier and additive commonly used in wood finishes (polyurethane is covered in Part 177). It does not include lead or mercury. Because lead is no longer used in common wood finishes, and mercury never was, it can be assumed that all common wood finishes use only FDA-approved ingredients.

- Second, the finish must be formulated in such a way that it does not leach more than a specified amount of extractive when subjected to a variety of specified tests. The point of these tests is to show the finish cures properly. It's important to note that these tests must be done on every batch of finish to establish that no foreign substance has gotten into the finish (for example, from the finish having been made in a dirty vat), and that these tests are expensive.

No manufacturer providing finishes to the woodworking community puts their

finishes through these tests. Thus, no manufacturer can legitimately claim they meet FDA regulations.

On the other hand, there's no evidence of problems, so manufacturers feel pretty safe in claiming food safeness anyway.

The Issue of Metallic Driers

Metallic driers are added to oil and var-

"Food safeness is a non-issue because there's no evidence of any problem. So far as we know, all finishes are safe to eat off of, and safe for children to chew on, once the finish has fully cured."

nish finishes to speed curing. Without driers, these finishes take many

days or weeks to cure.

Lead driers were once commonly used in oil and varnish finishes, but in the 1970s it was learned that lead is highly toxic, especially to children. The problem was associated with the relatively large amount

Continued on page 20



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FLEXNER ON FINISHING

Continued from page 18

of lead contained in pigment and not with the tiny amount contained in clear finishes. Nevertheless, to be safe, lead was removed from all commonly available paints and finishes, including oils and varnishes. (Lead is still used in some specialty art and marine finishes, and labels are required to disclose its inclusion.)

Other metallic driers, including salts of cobalt, manganese, zirconium and zinc, continue to be used in all varnishes and curing-oil finishes except raw linseed oil and pure tung oil. Without these driers, these finishes cure extremely slowly.

There is no indication that these driers cause health problems. A very small amount is used, and it is well encased in the cured finish film so that if any is ingested, it passes through the body without causing harm.

Other Finishes

All other common wood finishes also are safe for food and child contact. In fact, com-

mercially made wooden bowls, baby beds and children's toys are usually coated with one of these finishes.

The solvents, which cause some people to worry, evaporate out completely enough so they aren't a problem. And catalysts, which can be toxic in their liquid state, become so fully reacted with the finish that there is no evidence of a problem.

Conclusion

The issue of food safeness in finishes is a classic case of the concept "validation by repetition." Consistent, long-term repetition in wood-working magazines of a food-safeness issue, despite the complete lack of supporting evidence, has led to a widely held belief in the wood-working community that food safeness is an issue.

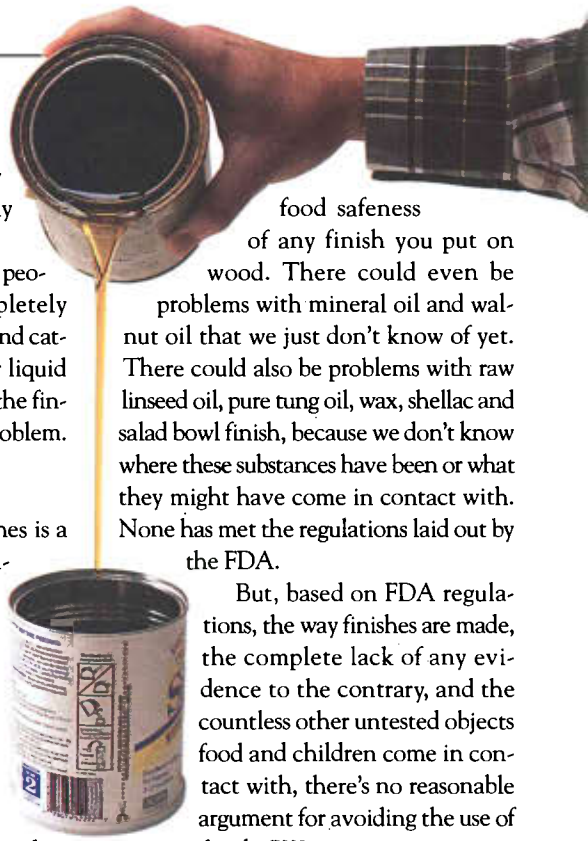
It shouldn't be. No other segment of society treats it as such. A more reasonable approach is as follows.

You can't be absolutely sure about the

food safeness of any finish you put on wood. There could even be problems with mineral oil and walnut oil that we just don't know of yet. There could also be problems with raw linseed oil, pure tung oil, wax, shellac and salad bowl finish, because we don't know where these substances have been or what they might have come in contact with. None has met the regulations laid out by the FDA.

But, based on FDA regulations, the way finishes are made, the complete lack of any evidence to the contrary, and the countless other untested objects food and children come in contact with, there's no reasonable argument for avoiding the use of any finish. **PW**

Bob Flexner is a nationally known finishing expert in Norman, Oklahoma, and the author of "Understanding Wood Finishing."



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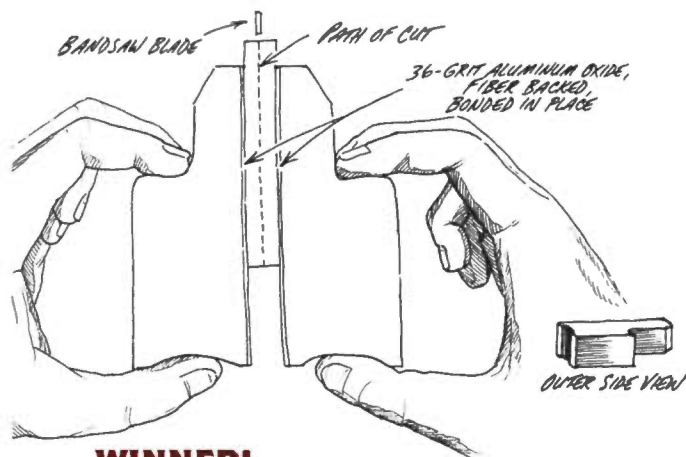
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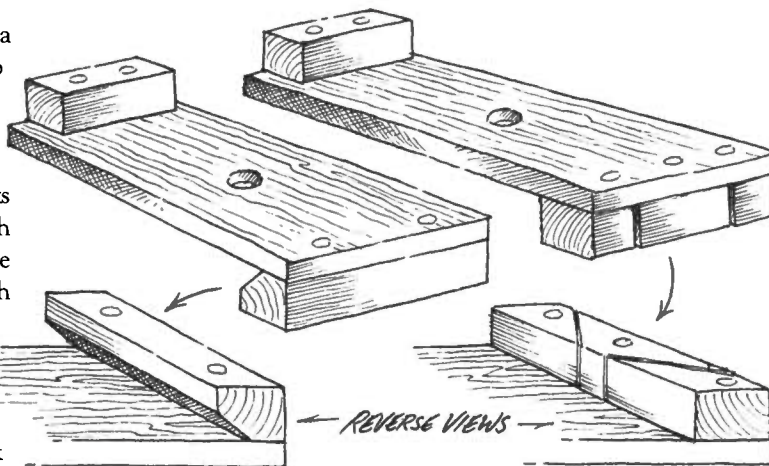
Saw Small Pieces Safely

A man of few words, Bud Gage of Mesa, Arizona, sent us this trick saying the blocks were "very useful for holding small pieces to be cut apart on a band saw, without extreme danger to your fingers. I've used mine for many years." Congratulations Bud, you're this issue's winner!

Two Bench Hooks That Make Many Tasks Easier

A bench hook is a useful shop-made piece of equipment, but a pair of matched sizes are even more valuable. These two hooks can support long work, and you can do detail work when using one of them. My hooks are $\frac{3}{4}$ " hardwood, 12" long and 6" wide, with $1\frac{1}{4}$ "-square crossbars glued and doweled on. Don't use metal fasteners, which might blunt tools. The hooks are basically identical with detail differences for special uses. Both hooks have one crossbar cut back $\frac{1}{2}$ " so you can saw either side without marking the bench. One crossbar on each is full width so you can use a plane on edge or a sanding block to shoot ends held against it. One of these crossbars is undercut at an angle, which helps to hold down dowels. The other has 45-degree cuts to guide a saw for mitering small parts. A hole at the center of a hook is useful when you want to knock something through, such as a dowel, or for removing a nail. **PW**

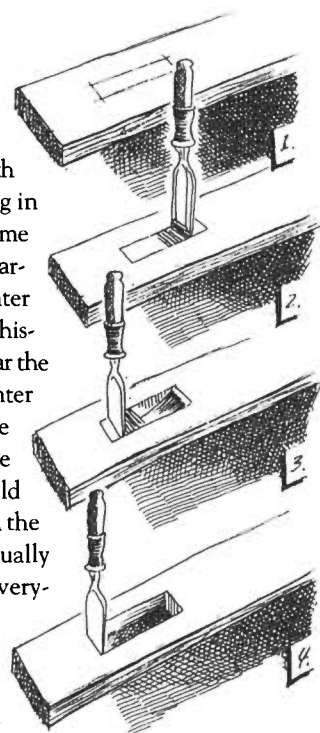
Percy W. Blandford
Stratford-on-Avon, England



Chisel a Through-Mortise

Here's the correct way to cut a through-mortise. First mark the mortise dimensions on both sides of the board, then use the chisel to lightly score the mortise shape with taps of a mallet or hammer (bevel facing in to the mortise). Next, with a chisel of the same width as the mortise, make repeated cuts parallel to one another, working from the center toward the end of the mortise. Angle the chisel toward the center from the ends and clear the waste with light taps back toward the center starting point. Now repeat this step while working toward the other end, leaving the mortise bottom dished. Your depth should be about half the depth of the board. Turn the board over and repeat these steps, eventually breaking through the mortise bottom everywhere but the two ends. The last step is to clean and square the ends with straight, sharp blows, still with the bevel facing toward the mortise. Again work from both sides of the mortise to avoid tearout.

The PW editors



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Illustrations: John McCormick

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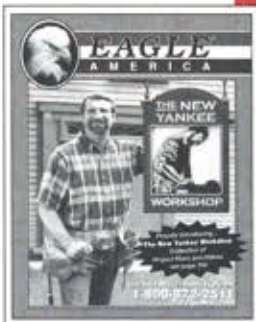
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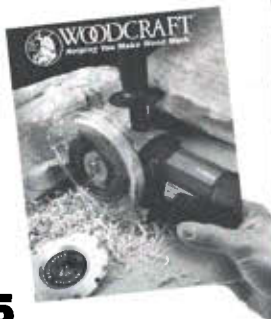
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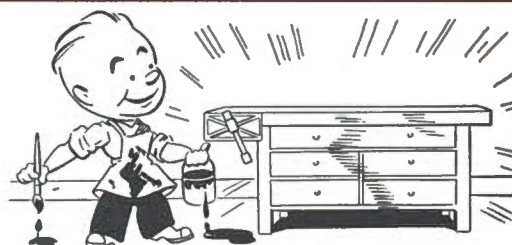
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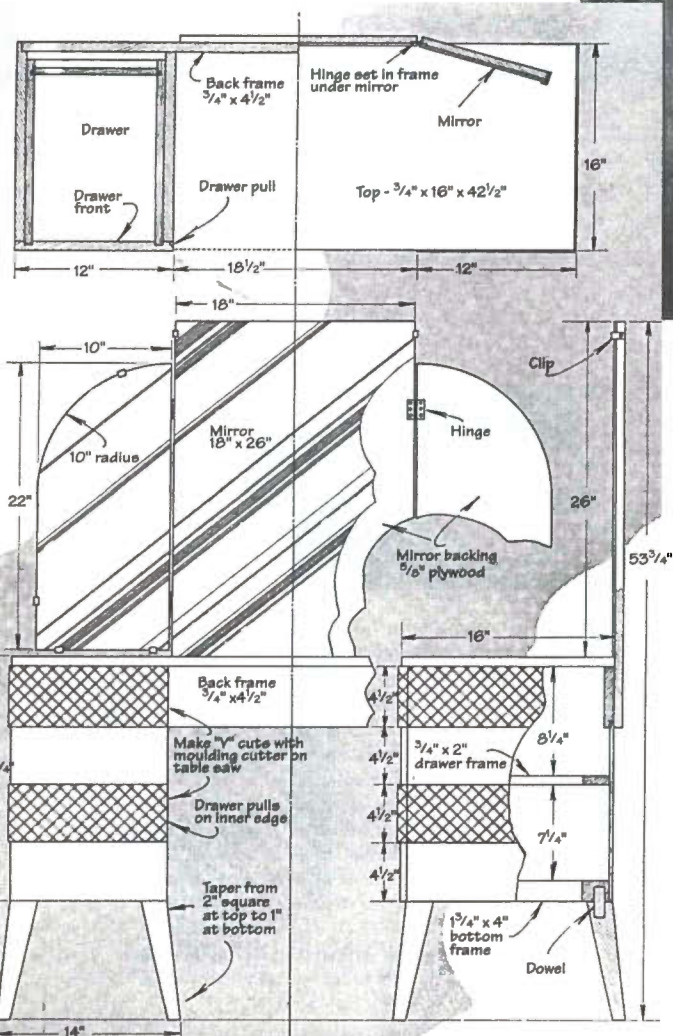
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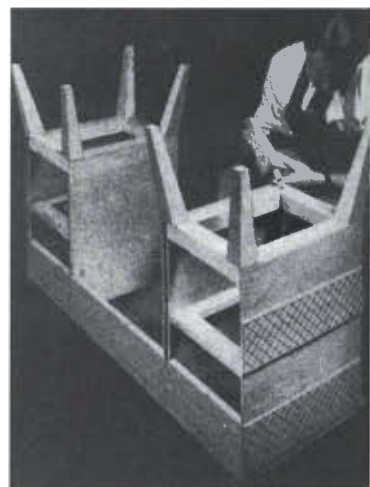
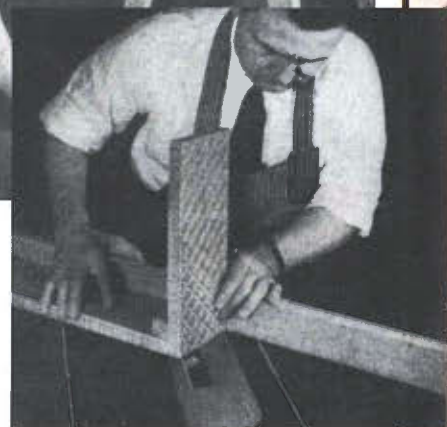


Modern VANITY

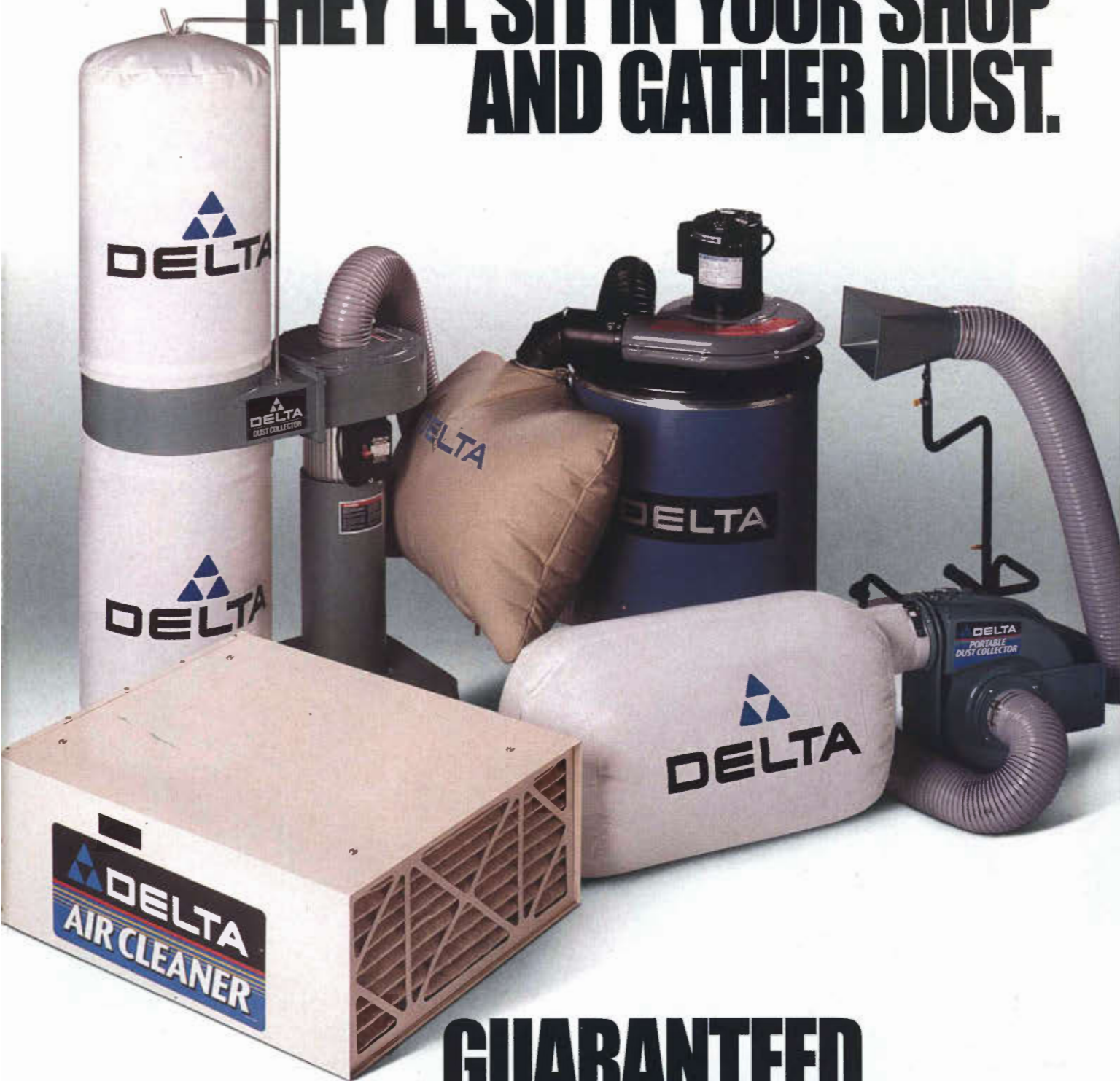
Here's a mahogany vanity of modern design you can build in your workshop. The design features a crisscross moulded pattern on the drawer fronts and sides as shown in the drawing. The construction is self-explanatory from the drawing with the exception of a few details. The crisscross pattern is formed by first making the various strip sections of the drawer fronts and sides in separate pieces. The strips on which this design appears are $\frac{3}{4}$ " thick, and the V-



cuts made with table saw moulding cutter are $\frac{1}{8}$ " deep and $\frac{3}{4}$ " apart. The drawer front and side strips are nailed together temporarily, and the moulding cuts are made as shown in the photograph (at right) so they line up when the vanity is assembled. These strips are then doweled to the top edge of the smooth pieces which are $\frac{5}{8}$ " thick to form the drawer fronts and sides. After the vanity is assembled, the legs are doweled in place. **PW**



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S H A K E R

Blanket Chest

Get ready for the
chilly winter nights
with this faithful
reproduction of a classic
from Canaan, N.Y.

I was flipping through a copy of *The Magazine Antiques* one afternoon when I noticed an attractive blanket chest in an advertisement for an antiques dealer in New York. The ad said the Shaker chest was from the John Roberts house in Canaan, N.Y., and had been built in 1850. All I knew was I wanted to build one. With a bit of research on traditional Shaker joinery, it was off to the shop.

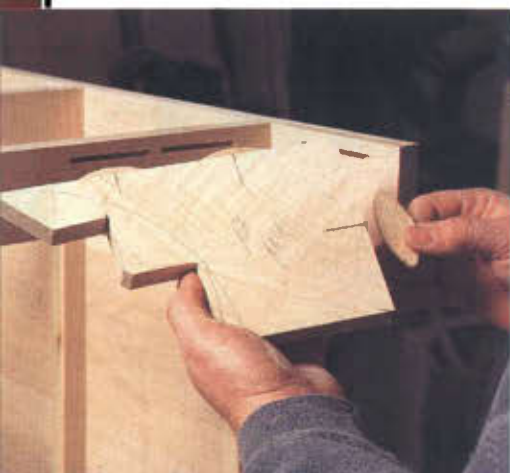
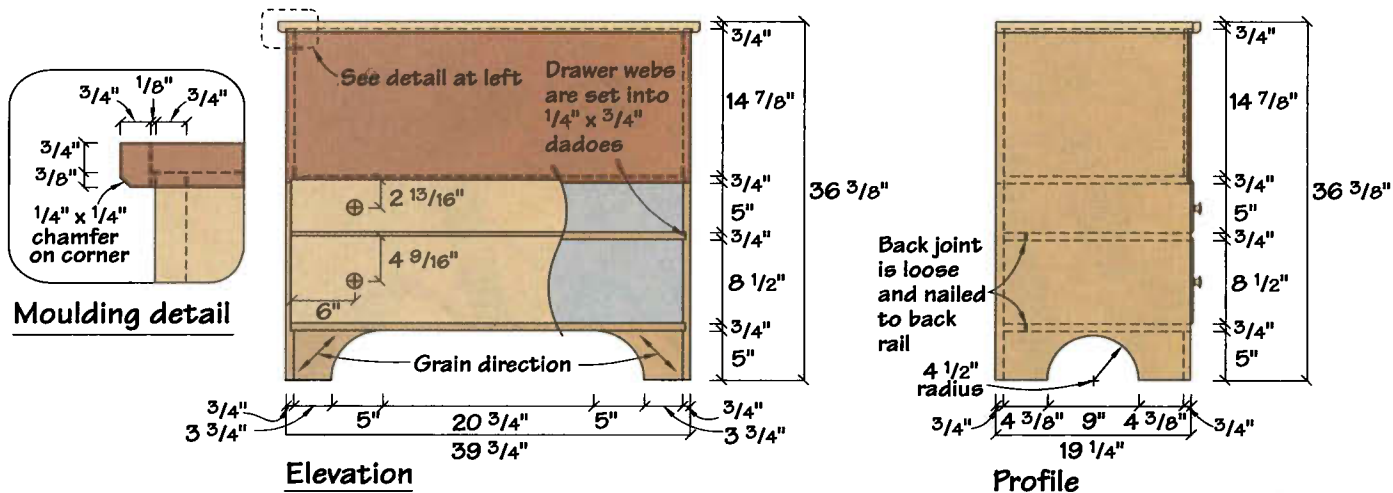
The chest is built exactly as Shakers did in the 19th century—with the notable exceptions of biscuits to attach the feet, aliphatic resin glue and a few power tools that would have shocked and excited the brethren. You'll probably need to glue up a few boards to create panels wide enough for the sides, front and top, unless you have access to some lumber in legendary 19th-century widths. Prepare the panels for the sides, front, upper back and top. You might also have to glue up panels for the larger drawer pieces.

Start with the two sides. Determine the best face and mark it for the outside, then mark the location of the three dadoes for the bottom and the two drawer divider webs as shown in the diagram. The dadoes are $\frac{3}{4}$ " wide and $\frac{1}{4}$ " deep and run the entire width of the sides. With the dadoes cut, next turn to the $\frac{3}{4}$ " x $\frac{5}{16}$ " deep rabbet on the back edge of each side. This rabbet should stop 5" up from the bottom of each side to leave a solid gluing surface for the rear feet.

Notch the sides on the front edge $\frac{3}{8}$ " deep to allow the front to overlap the sides.

by Glen Huey

Glen Huey builds custom furniture in his shop in Middletown, Ohio, for Malcolm L. Huey & Sons and is a regular contributor to *Popular Woodworking*.



Best Foot Forward

The front feet are different than the back feet and are cut to allow the grain to run diagonally from the corner of the base area. In addition, the front feet are radius cut on the inside. Attach the feet first, then cut the radius to shape to ease glue up.

This notch will match the front width. Finally, cut a half-circle on each side to form the feet of the base. Use a $4\frac{1}{2}''$ radius to mark the half-circle then cut it out with a jigsaw.

With the sides complete, turn to the front piece and cut a $\frac{3}{8}'' \times \frac{3}{4}''$ rabbet on each end and the bottom. The rabbets allow the front to fit into the notches on the front edge of each side, and they also allow the bottom to fit snugly into the front. The last step before assembling the case is to prepare the drawer web frames. The drawer runners have a $\frac{3}{4}''$ -long tenon cut on either end that fits into matching mortises cut in the front and rear dividers. Glue the front mortise-and-tenon joint but leave the back one loose to allow the frame to expand and contract.

Attach the front and rear feet to the bottom divider frame and case sides with

biscuits. The Shakers might have used only glue at this joint, but because we have the technology, cut biscuit slots for all the feet.

The case is now ready to assemble, but I'd recommend first taking a couple of minutes to finish sand the interior of the blanket chest area. It's tough to get into those corners once the chest is together. Little glue should be used to assemble the chest. A dot of glue at the center of the bottom dado and a dot at the ends of the web frame dados is sufficient. Nail the web frames in place with a single nail through the sides and into the end of the dividers. Nail the front and back pieces in place without glue because the joints are long-

Lower Back Adjustment

With the case glued up and the upper back in place, the loose lower back pieces are ready to be nailed in place. The half-lap design provides a closed back, but allows the wood to expand and contract with the wood movement.

grain to short-grain joints.

Complete the case assembly by gluing the front and rear feet in place. When the glue is dry, cut the radius on the front feet to match the curve on the sides and sand your handiwork. Finally, nail the shiplapped back pieces in place using nickels as spacers.

Next prepare the chest for the top. The chest top needs a stout hinge that requires more than the $\frac{3}{4}''$ back to support it. To accomplish this, glue and nail build-up blocks to the chest back. Once fixed in place, use your router and a straight bit to cut a mortise in the back and block for the hinge leaf.





Power Dovetails

The drawers are assembled in traditional Shaker fashion using half-blind dovetails on the front—but that doesn't mean you can't cheat on what tools you use. After marking and cutting the pins on the fronts, the band saw makes quick work of what would have been a lot of hand-cutting to create the tails.

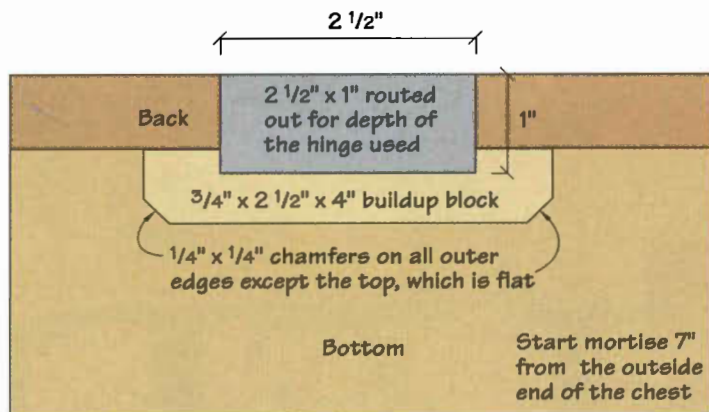
SCHEDULE OF MATERIALS: SHAKER BLANKET CHEST

No.	Item	Dimensions T W L	Material
2	Sides	$\frac{3}{4}$ " x $19\frac{1}{4}$ " x $35\frac{5}{8}$ "	P
1	Front	$\frac{3}{4}$ " x 16 " x $39\frac{3}{4}$ "	P
1	Back	$\frac{3}{4}$ " x 16 " x $39\frac{1}{8}$ "	P
1	Bottom	$\frac{3}{4}$ " x $18\frac{1}{8}$ " x $38\frac{3}{4}$ "	S
1	Top	$\frac{3}{4}$ " x $19\frac{3}{8}$ " x 40 "	P
4	Drawer dividers	$\frac{3}{4}$ " x $2\frac{1}{4}$ " x $38\frac{3}{4}$ "	P/S
4	Drawer runners*	$\frac{3}{4}$ " x $1\frac{1}{4}$ " x $15\frac{3}{8}$ "	S
2	Rear feet	$\frac{3}{4}$ " x 5 " x 5 "	S
2	Front feet	$\frac{3}{4}$ " x $6\frac{1}{2}$ " x $14\frac{1}{2}$ "	P
2	Build-up blocks	$\frac{3}{4}$ " x $2\frac{1}{2}$ " x 4 "	P
1	Small drwr front †	$13\frac{1}{16}$ " x $5\frac{5}{16}$ " x $38\frac{7}{8}$ "	P
1	Large drwr front †	$13\frac{1}{16}$ " x $8\frac{13}{16}$ " x $38\frac{7}{8}$ "	P
1	Small drwr back	$\frac{9}{16}$ " x $4\frac{7}{8}$ " x $38\frac{1}{4}$ "	S
1	Large drwr back	$\frac{9}{16}$ " x $8\frac{3}{8}$ " x $38\frac{1}{4}$ "	S
2	Small drwr sides	$\frac{9}{16}$ " x $4\frac{7}{8}$ " x 17 "	S
2	Large drwr sides	$\frac{9}{16}$ " x $8\frac{3}{8}$ " x 17 "	S
2	Drawer bottoms	$\frac{5}{8}$ " x $17\frac{1}{4}$ " x $37\frac{1}{2}$ "	S
	Back boards ‡	$\frac{5}{8}$ " x 15 " x $39\frac{1}{8}$ "	S
6 lineal feet of $\frac{5}{8}$ " x $1\frac{1}{16}$ " bevel edged top moulding			
1	Pair, 8" strap hinges, #HF-9, Horton Brass 800-754-9127		
1	Box lock, #TJI-062, Ball and Ball 800-257-3711		
4	$1\frac{1}{2}$ " diameter wooden knobs		
* $\frac{3}{4}$ " tenon on both ends			
† $\frac{5}{16}$ " lip side and top, $\frac{1}{8}$ " bottom			
‡ Size given is size of complete, half-lapped back			
P = Primary wood - Maple • S = Secondary wood - Poplar			



Un-Shaker-Like Help

With the hinge blocks glued in place against the cabinet back, mark the hinge shape on the top of the block and the back. Next rout out the hinge mortise to the full depth of both hinge leaves.



Plan detail of hinge buildup

Now prepare the moulding that's attached to the front edge and sides of the top. The moulding is more than decorative, it also forms a dust seal across the lid. First bevel the moulding on the bottom edge to soften the corner, miter the pieces, and then nail it flush to the top edge.

Position the top on the chest with the back edges flush. Mark the hinge location on the top, then attach the hinges.

Now it's time to work on the drawers. The drawers are assembled using rabbeted half-blind dovetails at the front and through-dovetails at the rear. First rabbet the drawer fronts to form a $\frac{5}{16}$ " lip on the top and sides, and an $\frac{1}{8}$ " lip on the bottom edge. The dovetail joint attaches to the rear of the lip formed by the rabbets. To keep the work traditional, the drawer bottoms are made from $\frac{5}{8}$ "-thick solid wood, and the

three sides of the bottom are beveled to reduce the thickness in order to slide into the $\frac{1}{4}$ " x $\frac{1}{4}$ " grooves in the sides and drawer fronts. Next tack the bottom into the drawer back to square up the drawer.

Some final hardware and you're ready to finish the piece. Check the instructions (if any) on mounting the chest lock and install the locking hardware. Drill and attach the knobs to the drawers.

To give the piece an appropriate 19th century finish, I used Moser's Early American Cherry aniline dye and applied a couple of coats of lacquer to protect it.

My wife isn't always happy with the number of magazine subscriptions I have. But when I can turn up an idea like this chest from a magazine ad, I'm allowed to keep those subscriptions current. **PW**

After several years and numerous prototypes, we've come up with the perfect miter sled for the Little Shop That Could or any table saw.

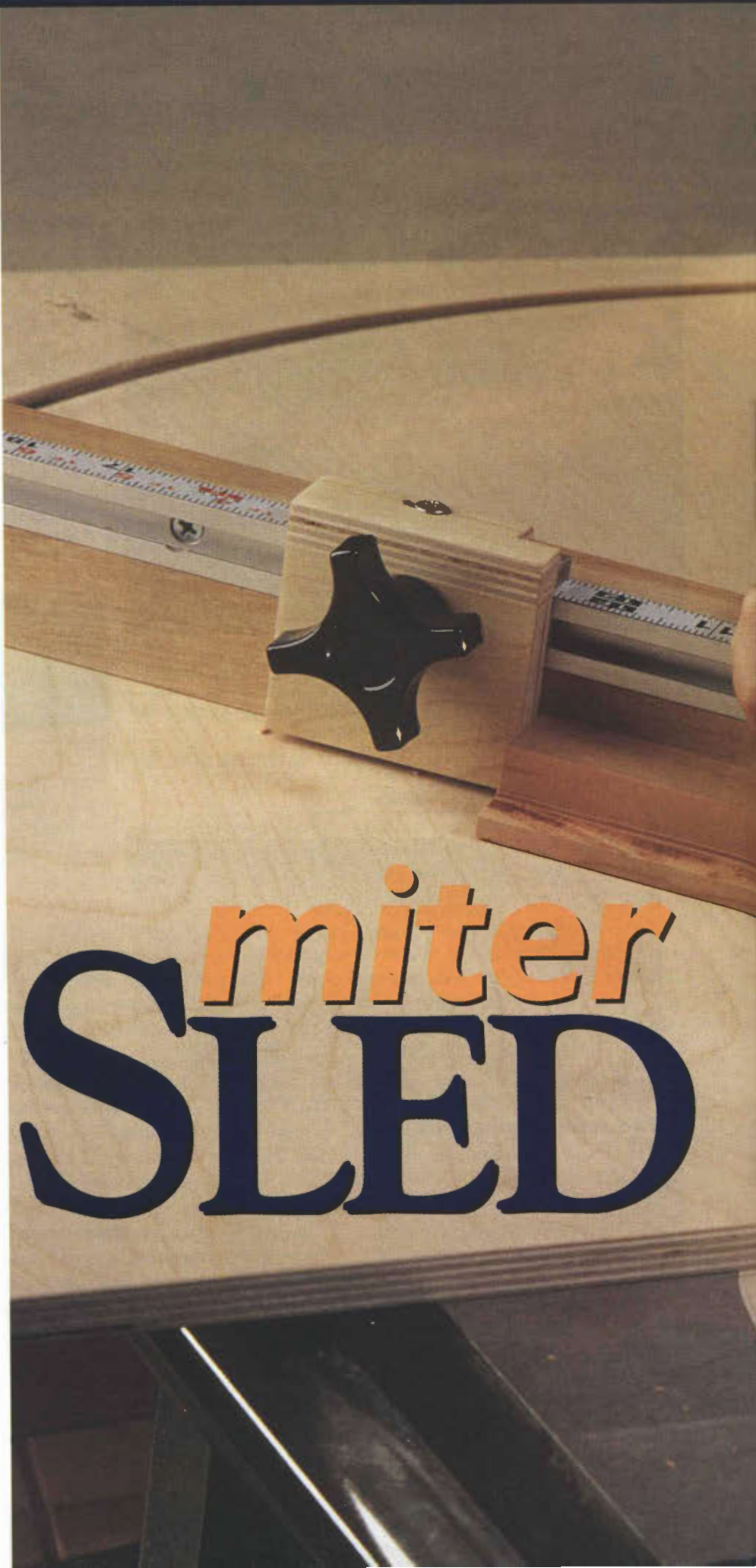
I'm always amazed by woodworkers who spend hundreds of dollars to upgrade the rip fence on their table saw but still use the inaccurate slot miter gauge that came with the saw for crosscuts. Because of this, we've spent a lot of time in the last few years developing the perfect *and* inexpensive miter sled. I think we've got it just right.

This sled works on any table saw with a miter slot. I designed mine to work on the Grizzly G1022 table saw in the Little Shop That Could Mark II, a rolling workshop on wheels featured in the September 1999 issue. If you don't have a Grizzly saw, the only thing you might have to change is where the miter gauge bar attaches to the bottom of the sled.

Here's why you should spend a day or so in your shop building this jig:

- The sled will make perfectly square cutoffs.

By Jim Stuard



miter SLED



Photo by Al Parmili

You will have to make a few passes with your router to cut through the plywood base. Take your time and go slowly.

- The fence pivots so you can cut any miter between 0 and 50 degrees.
- It's simple to micro-adjust the sled's fence square to the blade.
- The sled works on the right side of the blade so you can use your saw's rip fence as a stop for extra-long multiple crosscuts.
- The hardware costs less than \$35.

Start With Arcs

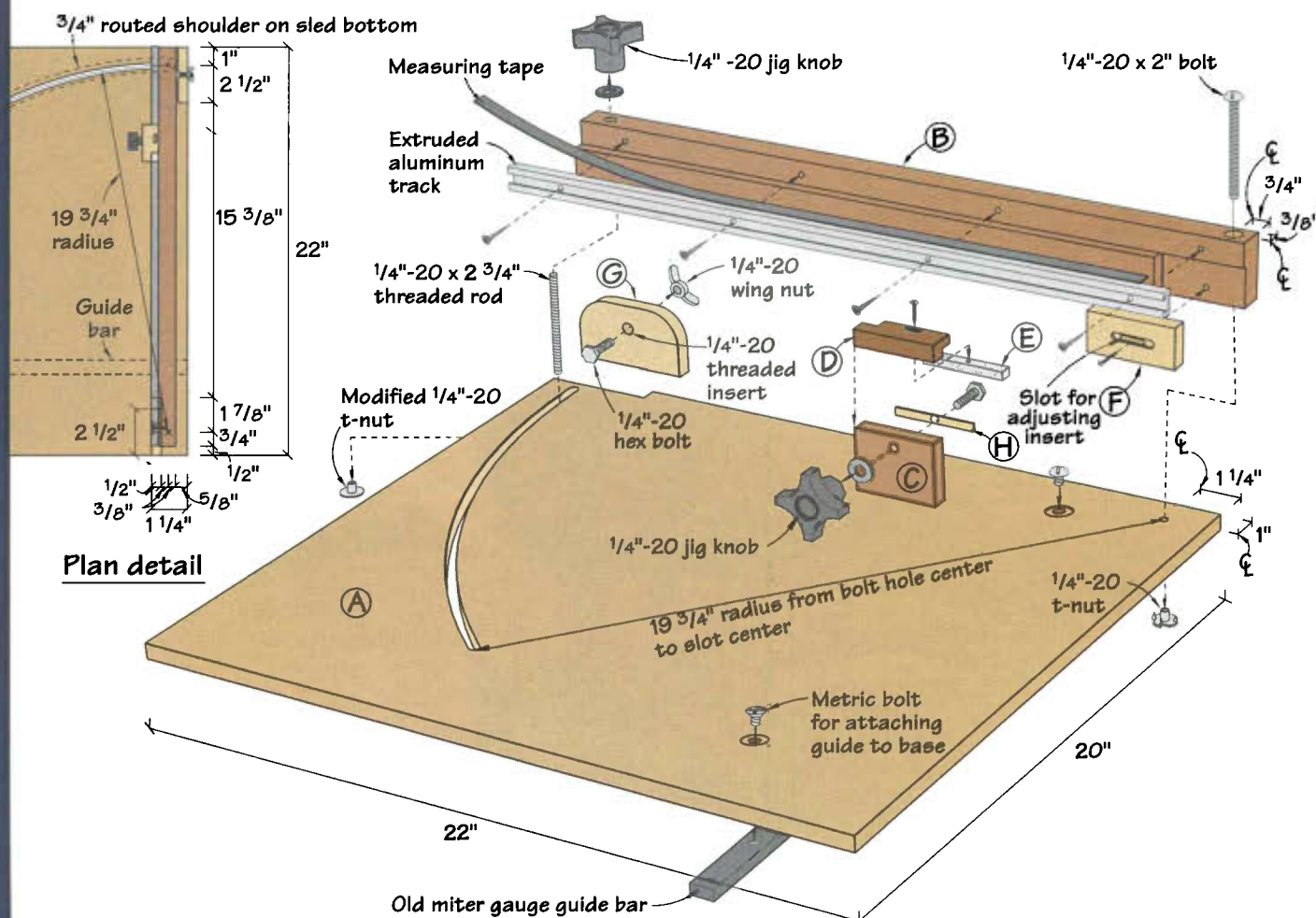
Begin by cutting out the sled bed and fence parts according to the Schedule of Materials. First make the arched slot in the sled table. This allows the sled's fence to pivot to any angle between 0 and 50 degrees. But before you can cut the slot, you need to make a simple radius-cutting jig for your router. This jig allows you to cut perfect circles, so you'll find a lot of uses for it in other projects. Build the jig using 1/4" Plexiglas™ and 1/4" plywood as shown in the diagram at right. Mount the base of your plunge router to it. Set the jig to cut a 19 3/4" arc, to the center of a 1/4" straight bit. Drill a 1/16" hole through the sled base at the pivot

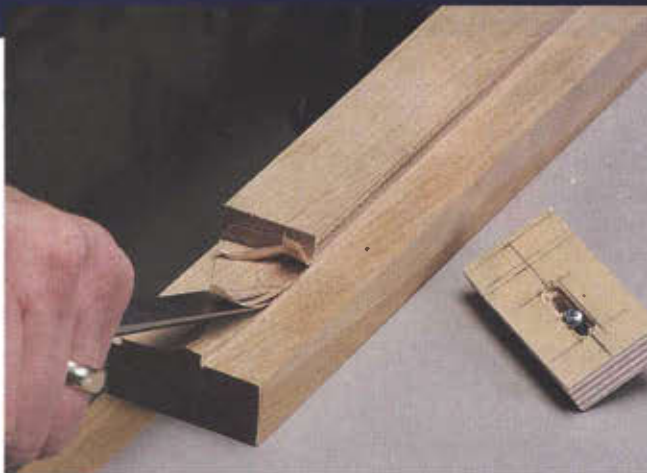


point. Place a finishing nail through the pivot hole in the radius jig and into the 1/16" hole in the sled base. Rout a slot from the 0 degree line to the 50 degree mark.

When you've finished this cut, you need to widen the slot by 1/16" to allow a t-nut to slide freely along it. Adjust the radius-cutting jig to rout a bit more to both sides of the slot until a 1/4"-20 t-nut slides freely but without wobbling in the slot.

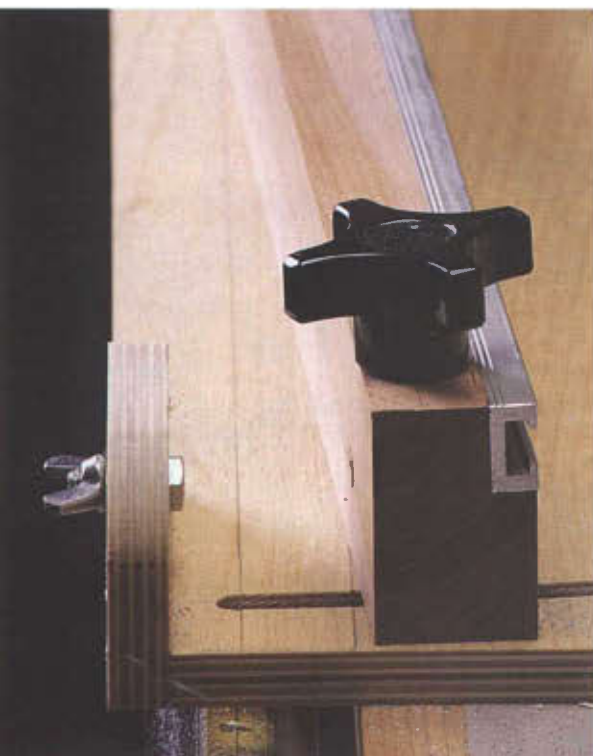
Now flip the sled's bed over and rout a 3/8"-wide x 1/16"-deep rabbet on both sides of the original slot. This accommodates the flange of the t-nut. Now drill a shallow 3/4" hole on the bottom side of the sled bed at the pivot point to accommodate the washer and bolt head that will act as the pivot for the fence. Then drill a 1/4" hole through the sled's bed that's centered on the pivot point.





To attach the zero-clearance block, lay out the notch on the fence and cut out the waste with a drill. Clean it up with a chisel, then cut and fit the block. Cut two clearance slots in the block and attach with screws (above).

With the bolt attached, crosscut a scrap to test the fence for square. Then lock down the stop with the set nut (left).



the pivot hole on the sled's bed. Check the fit of the fence to the base. You'll notice that the fence is $\frac{1}{2}$ " shorter than the width of the base. This accommodates a fitted block at the end of the fence nearest the blade. The block gives zero clearance to the cut and reduces tear out on the backside of your crosscuts. This is more important on square cuts than angled ones, but if you make the fence right up to the edge of the base, you'll cut off the end when you pivot it.

Finish the sled base by installing the guide bar from your old miter gauge. Dismantle your miter gauge and measure the distance between the saw blade and miter slot. To give yourself a true "zero-clearance cut," install the bar $\frac{1}{16}$ " farther away from the blade. This edge will get cut off when you slide the sled through the first time. Don't worry about squaring the base for now. Later you'll install a guide block that allows for minute adjustments in the squareness of the sled's fence.

Fences and Rabbets

Next make the sled's fence. To install the T-track you'll need to cut a $\frac{3}{8}$ " x $\frac{3}{4}$ " rabbet. You can do this with two cuts on the saw (see fence diagram on the next page). Screw the T-track into the rabbet through its countersunk holes. Then drill the pivot and stop holes on the fence that match

Complete the base by cutting a notch in the bed and attaching the stop block to the back right hand corner with screws and glue. The bolt in this stop block allows you to micro-adjust the squareness of the fence to your blade. Install a $\frac{1}{4}$ "-20 threaded insert into the stop block. Put in a $\frac{1}{4}$ "-20 x $1\frac{1}{2}$ " bolt with the head toward the fence. Place a wing nut on the other end to set the fence square. Mark where the bolt head touches the fence and place a screw centered there to reinforce the fence when it strikes the stop bolt. Now take the sled out for a test cut. If it trims off a little of the edge of the bed, that's OK. Use a test piece to check for square and set the stop block to keep it that way. Set and check the other angles, and you're finished with the sled.

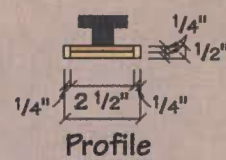
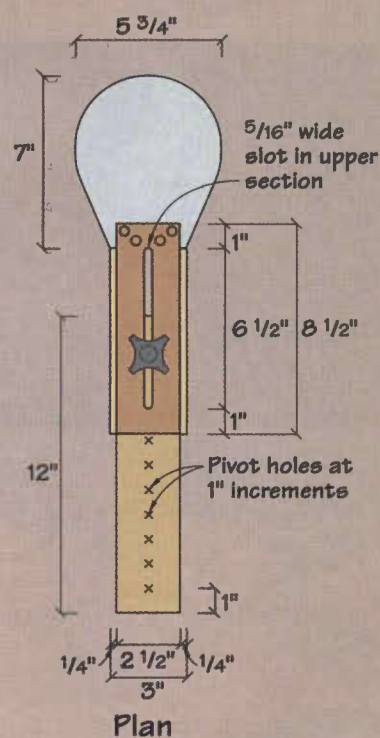
A Super Stop

Now make the sliding stop. Cut out the

A QUICK AND USEFUL RADIUS-CUTTING JIG



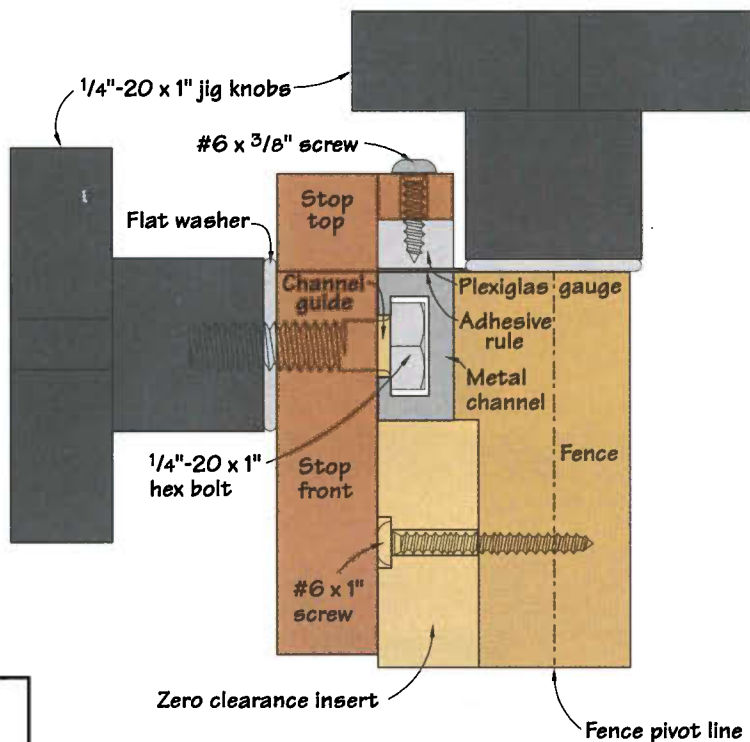
In order to mount the base on the jig accurately, use dividers to scribe a circle the diameter of the router base on the Plexiglas. Place the router base on the Plexiglas in position with the handles in line with the jig. Mark the locations of the screw holes in the base with a nail. Carefully drill and counter-sink the mounting holes. Mount the base, and you're ready to rout.



parts according to the Schedule of Materials. It's best to cut out long pieces of wood for the two different parts of the stop, then cut them to length later. One, it's safer. And two, you might want to make other jigs later, so keep some of this pre-made stop material on hand.

First glue the "channel guide" to the front piece of the stop. The channel guide is a piece of scrap measuring $\frac{3}{32}$ " x $\frac{5}{16}$ " x $2\frac{1}{2}$ " that runs in the opening of the T-track to guide the stop. See the diagram at right for its location. Now work on the top part of the stop. Cut the rabbet on the bottom side that accommodates the Plexiglas, which you'll use to set the length of your crosscuts. Nail both pieces of the stop together and make your first, official square cut on the sled by cutting the stop assembly square. Cut $2\frac{1}{2}$ " off the assembly to the left side of the blade and cut a $\frac{1}{2}$ "-long adjustment slot for the Plexiglas (this will allow you to adjust the Plexiglas to fine-tune your crosscuts). Attach the Plexiglas to the stop with a set screw through the adjustment slot you just cut.

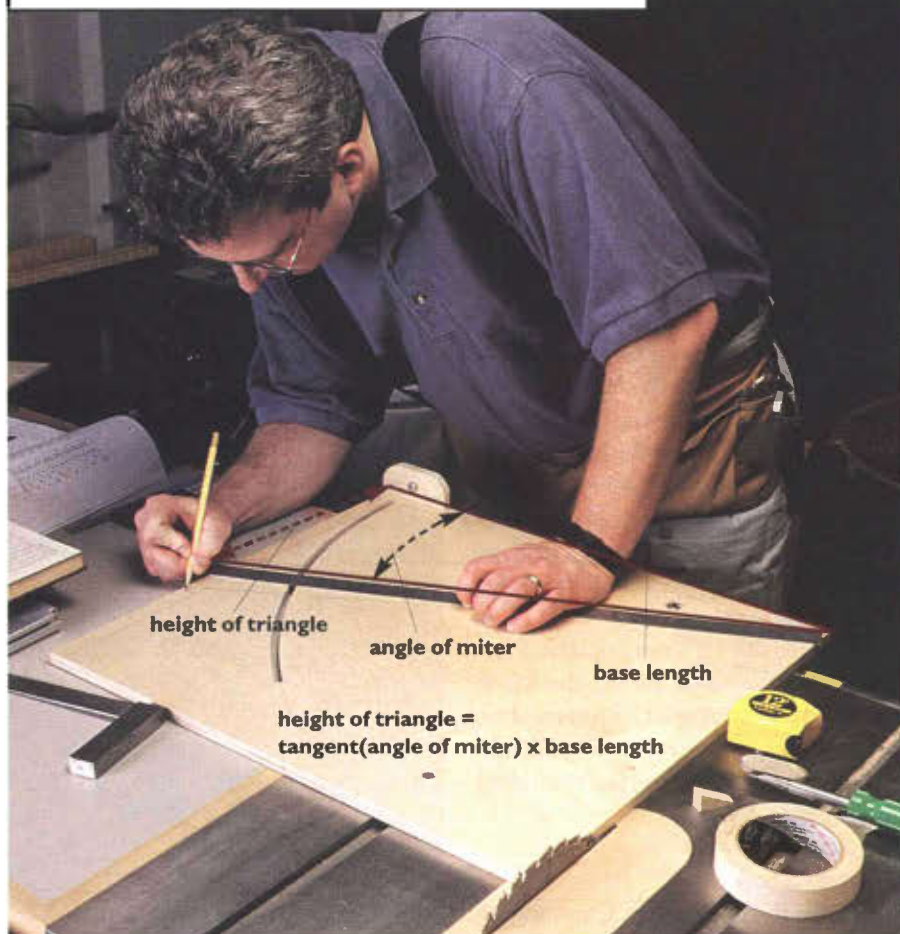
Finish the stop by making a final adjustment to the



Full-size profile of stop and fence

SCHEDULE OF MATERIALS • MITER SLED

No.	Ltr.	Item	Dimensions T W L	Material
A	I	Sled bed	$\frac{1}{2}$ " x 20" x 22"	Plywood
B	I	Fence	$1\frac{1}{4}$ " x 2" x $21\frac{1}{2}$ "	Plywood
C	I	Fence stop front	$\frac{1}{2}$ " x 2" x $2\frac{1}{2}$ "	Plywood
D	I	Fence stop top	$\frac{1}{2}$ " x $\frac{7}{8}$ " x $2\frac{1}{2}$ "	Plywood
E	I	Gauge	$\frac{1}{2}$ " x $\frac{3}{8}$ " x $2\frac{1}{2}$ "	Plexiglas
F	I	Clearance block	$\frac{1}{2}$ " x $1\frac{1}{4}$ " x $2\frac{5}{8}$ "	Plywood
G	I	Stop block	$\frac{1}{2}$ " x 2" x $3\frac{1}{2}$ "	Plywood
H	I	Channel guide	$\frac{3}{32}$ " x $\frac{5}{16}$ " x $2\frac{1}{2}$ "	Scrap



fence. Apply the tape measure mentioned in the Schedule of Materials. You'll have to cut off the first $\frac{1}{2}$ " of the tape and then, using a test piece, adjust the gauge to pin-point accuracy. To use the sled for longer cuts, clamp a gauge block to the rip fence. This keeps the part being cut from binding with the fence when you push it through. Add the thickness of the block to the measurement and you'll be ready to get to work on the next project for the Little Shop, a fully functional router table. **PW**

SUPPLIES

From Woodcraft, 800-225-1153
(www.woodcraft.com)
1 - 24" aluminum track, #128218, \$9.99
1 - Knob w/stud, #27R15, \$1.99
2 - Knobs w/insert, #27R14, \$1.99 each
1 - Tape rule (reads L to R), #08Y41, \$6.99

After the sled is finished, lay out the angles for miter cuts. First mark, on the outside end of the fence, a line that shows where the pivot point is on the fence. A calculator and simple trigonometry does the rest. This formula determines the height of a right triangle when you know the length of the base (the fence) and the angle of your miter. Formula: $\text{Tangent}(\text{desired angle}) \times \text{base length} = \text{height of the triangle}$. Once you mark the height of the triangle on your sled, set the fence to that point by lining up the mark on the sled with the mark on the end of the fence.

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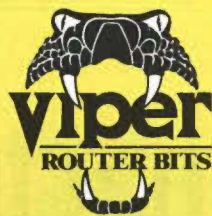
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16 pc

Set Includes:
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5/8", 3/4", 7/8",
1", 1-1/8",
1-1/4", 1-3/8",
1-1/2", 1-5/8",
1-3/4", 1-7/8",
2", & 2-1/8" bits
in a wood box.

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1-7/8", 2", 2-1/8", 2-1/4", 2-3/8", 2-1/2", 2-5/8",
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compact ENTERTAINMENT UNIT

A media center
doesn't have to
cover your entire
wall. Sometimes,
smaller is better.

It's all the rage to build entertainment centers that look like armoires. But sometimes an enormous cabinet is more than a room can handle. That was exactly the problem of the young couple I built this piece for.

They had purchased a large entertainment unit for their new home that overpowered the corner where it was supposed to stand. After looking at their living room and a few photos of traditional furniture they liked, we came up with this design for a compact entertainment unit that fit their spacious living room and their budget.

by Troy Sexton

Troy Sexton designs and builds custom 18th century furniture and is a private woodworking instructor in Sunbury, Ohio, for his company, Sexton Classic American Furniture.

Photography by Christopher Schwarz



This traditional-looking piece is made from solid hardwood, though you could substitute veneered plywood for the sides, bottom and back. There is no fancy joinery in this cabinet. The case is built using dados and screws. The face frame is put together using mortises and tenons. The raised-panel doors are built the same way. The top is screwed to the case.

That said, there are a few good tricks you can pick up here. One is the way I fit the face frame to the case. I'll show you how to make it perfect the first time by making it a bit oversized. And I'll also show you some tricks for fitting inset doors that I've developed during my years as a cabinetmaker.

Begin With the Case

If you are going to use solid wood for this project, first glue up the panels for the sides, bottom and top. Clamp and allow them to dry. Then start milling the parts. Cut a $\frac{3}{4}$ "-wide x $\frac{1}{8}$ "-deep dado in the sides to

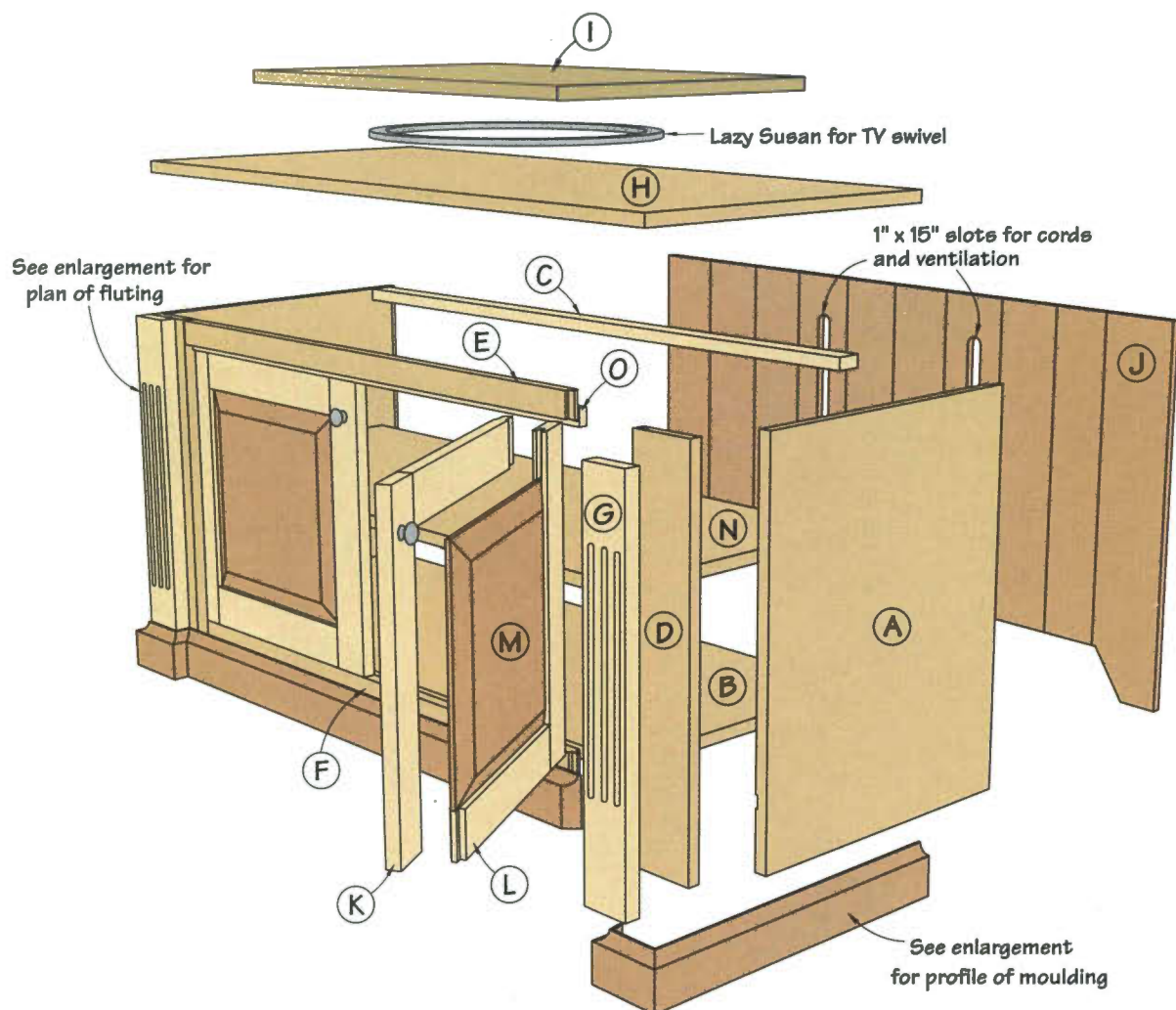
Glue and nail, yes nail, the face frame to the case. The nail holes will be covered by the fluted columns later. Here you can see how the face frame slightly overhangs the case. I'll trim that later for a perfect fit.

hold the bottom. For the back, cut a $\frac{1}{4}$ " x $\frac{1}{2}$ " rabbet on the back edge of the sides. Now is a good time to drill the holes for the adjustable shelf pins. There's only one adjustable shelf in this project; you could add a second if it suits your electronic components.

Now assemble the case. I glued the bottom into the dado and then ran pocket screws through the bottom and into the sides.

Make sure the bottom piece is flush to the front edge of the sides. Then screw a

stretcher between the sides. This stretcher is located at the rear of the cabinet and is flush to the top and the inside of the back rabbet on the sides. The back pieces



rest against this piece and the back edge of the bottom shelf when you install them at the end.

Face Frame

Face frames can be tricky to fit. If they shift the tiniest bit when you attach them, you can be in big trouble. Here's how to avoid that problem: when you rip the face frame stiles to their finished width, add $\frac{1}{16}$ " to the width. This will make your face frames overhang the sides slightly. So if the face frame shifts when it's attached, you can relax. Use your router and a flush trimming bit to flush the face frame with the case. It's a simple but effective trick.

Build the face frame using mortise-and-tenon joinery. My tenons are $\frac{3}{8}$ " thick and 1" long. I cut my tenons on the table saw using a stack dado. Here's an unusual trick to avoid blowing out the shoulder when cutting your tenons on your table saw. First cut the ends of the tenons with

the dado stack as you normally would, leaving about $\frac{1}{4}$ " before the shoulder. Then make the final shoulder cut by pulling the wood back over the blade toward you. It sounds scary, but if you're careful it's not difficult, and it really does minimize tearout.

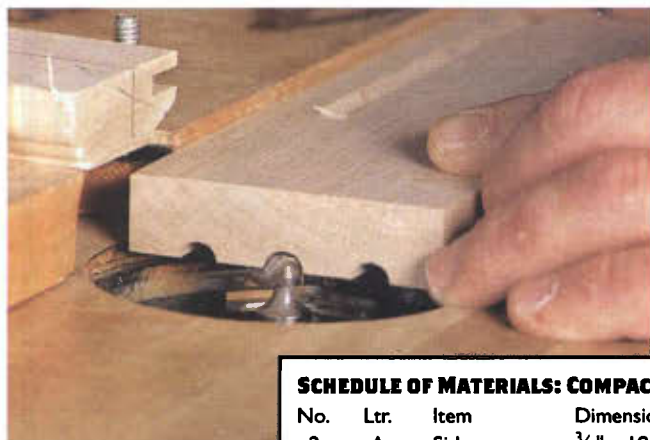
Glue and clamp the face frame and allow it to dry. Nail and glue the face frame to the carcass. The nail holes will be covered by the fluted faux columns you'll attach later. Nail the door stop to the back of the top rail.

Make the Doors

The raised-panel doors are built using haunched tenons. First cut the 1"-long tenons on the rails. I cut the $\frac{3}{8}$ " haunch on my table saw using a stack dado. Now cut the $\frac{3}{8}$ " x $\frac{3}{8}$ " groove on the inside

After I cut the grooves on the stiles and rails of the door, I cut the mortises. I use this monstrous General mortiser, which is a joy. A drill press and chisel will work just fine (left).

Here you can see how the haunched tenon fits into the mortise and groove in the door's stiles. This sound and traditional joint will last a long time (below).



Cut the flutes using a fluting bit in your router. If you think you'll ever make fluted columns again, make a template like this one to quickly set up your fence next time.

SCHEDULE OF MATERIALS: COMPACT ENTERTAINMENT UNIT

No.	Ltr.	Item	Dimensions T W L	Material
2	A	Sides	$\frac{3}{4}$ " x $18\frac{1}{2}$ " x $23\frac{1}{4}$ "	Cherry
1	B	Bottom	$\frac{3}{4}$ " x 18 " x $42\frac{1}{4}$ "	Maple
1	C	Stretcher	$\frac{3}{4}$ " x $1\frac{1}{2}$ " x 42 "	Maple
2	D	Face stiles	$\frac{3}{4}$ " x 4 " x $23\frac{1}{4}$ "	Cherry
1	E	Top rail	$\frac{3}{4}$ " x $1\frac{1}{2}$ " x $37\frac{1}{2}$ "	Cherry
1	F	Bot. rail	$\frac{3}{4}$ " x 4 " x $37\frac{1}{2}$ "	Cherry
2	G	Columns	1 " x 3 " x $23\frac{1}{4}$ "	Cherry
1	H	Top	$\frac{3}{4}$ " x 21 " x 45 "	Cherry
1	I	TV base	$\frac{3}{4}$ " x 17 " x $27\frac{3}{4}$ "	Cherry
1	J	Back boards	$\frac{1}{2}$ " x $23\frac{1}{4}$ " x $42\frac{1}{4}$ "	Maple
4	K	Door stiles	$\frac{3}{4}$ " x $2\frac{1}{2}$ " x $17\frac{3}{4}$ "	Cherry
4	L	Door rails	$\frac{3}{4}$ " x $2\frac{1}{2}$ " x $14\frac{3}{4}$ "	Cherry
2	M	Door panels	$\frac{5}{8}$ " x $13\frac{1}{4}$ " x $13\frac{1}{2}$ "	Cherry
1	N	Adj. shelf	$\frac{3}{4}$ " x $17\frac{3}{4}$ " x $41\frac{3}{4}$ "	Maple
1	O	Door stop	$\frac{1}{2}$ " x 1 " x $35\frac{1}{2}$ "	Cherry

8' of 3"-wide moulding

edge of the rails and stiles using a dado stack in your table saw. Cut the $\frac{3}{8}$ "-wide x 1"-deep mortises centered on the groove. Now raise the $\frac{5}{8}$ "-thick panel. I like to remove most of the wood with my table saw then finish the cut on my router or shaper with an 8-degree vertical panel-raising bit. This prevents me from having to reset the fence on my router table or shaper for two or more passes.

Now glue up the doors. Make sure you don't put any glue in the groove. You want the panels to float there.

Trim Out the Cabinet

First finish sand the entire cabinet inside and out. Then cut the $\frac{3}{8}$ "-wide x $\frac{3}{16}$ "-deep flutes in the columns using a fluting bit in your router table. Glue the columns to the case. Cut a $\frac{1}{2}$ " x $\frac{1}{2}$ " cove on the base moulding. Miter and attach it to the front and sides of the case.

Cut a roundover on the top and bottom edge of the top and attach it to the case using slotted screw pockets, cleats or whatever method you prefer.

Now add the $\frac{1}{2}$ "-thick back pieces. Each piece has a $\frac{1}{2}$ "-wide $\frac{1}{4}$ "-deep rabbet

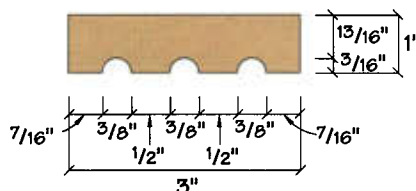


Use glue and clamps to attach the fluted columns to the face frame. I use little scraps of wood to prevent my bar clamps from marring the surface of my work.

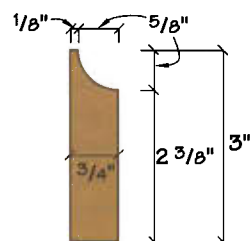
Here you can see my shims at work. These hold the door in place for final fitting. I highly recommend you make some of these.



on each side (except the two end pieces, which have a rabbet on only one edge). I also cut a small bead on the long edges using a beading bit in my router. This rabbet allows you to shiplap the pieces and allows for seasonal expansion and contraction. Sand the pieces and nail them into place.



Plan detail of column fluting



Detail profile of moulding

Fit the Doors and Finish

I build my doors the same size as their opening and then trim them down to size on my jointer. This assures a perfect fit if the face frame or door is slightly out of square. Here's how to do it. First fit the door's hinge stile against the face frame stile and note where the door's rails and face frame rails are not parallel. Mark this information on the door.

Now set your jointer to make a $\frac{1}{32}$ " cut. Cut the excess from the door by starting the cut in the middle of the door rail where the excess begins. Then clean up that cut by making a second pass on your jointer that runs the entire length of the door.

It's a good thing we eat a lot of popsicles at our house. I use them to space my back pieces. You can also see the stretcher in action in this photo.

Next fit the door using $\frac{1}{16}$ "-thick shims all around. You can make shims like this out of wood. Attach the doors to the face frame using non-mortise hinges.

One last detail before finishing. Attach the Lazy Susan to the board beneath the TV. I decided not to screw the Lazy Susan to the cabinet because who knows what this cabinet will become in its next life. Instead, I attached some of those clear adhesive door bumpers to the underside of the Lazy Susan and set the thing in place on top of the cabinet. It



works great.

The finish is simple. Apply three coats of clear lacquer, sanding between each coat. **PW**

SUPPLIES

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4 non-mortising hinges, item
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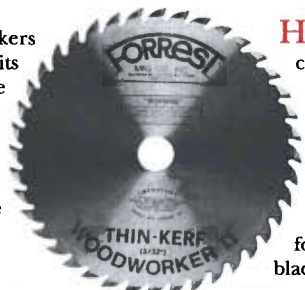
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12" x 80 T (1/2" or 1" hole, 1/2" K)	\$161	\$163	\$145
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10" x 80 T	\$139	\$125	\$111
12" x 80 T	\$149	\$134	\$119
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Use any of these blades for a month. If you are not completely satisfied, return the blade for a complete refund. No other blade company will make that kind of guarantee—because there's no other blade like a Forrest blade!

2-4 Days Sharpening
ON ALL MAKES OF CARBIDE BLADES



Photo by Mark Alexander Photography

Side Table

By changing a
couple of dimensions,
this side table
becomes a sofa table.

This design has become a staple of my business, and I'm almost embarrassed to admit that some of its details started as mistakes. The bow-tie apron started out as an apron with a chevron cut on the underside. One day I wasn't paying attention and marked the chevron on both sides of the apron. I stopped, looked at the piece, and said, "why not." Sometimes the best work is the adaptation of a fortuitous accident.

These simple tables use mortise-and-tenon joinery for strength and a mechanical fastener to attach the top. In fact, these tables are so simple, you could build them with a jigsaw, handplane, chisels and hammer. There isn't all that much wood invested in the project,

by Mark Kessler

Mark Kessler is a graduate of the Genoa Institute for Furniture Design and Construction and owns Furniture By Design in Cincinnati, Ohio, which specializes in custom contemporary designs.



By lengthening the long aprons and the top, the side table design becomes a perfect sofa table.



The two rabbets on the top of the leg add a simple but classy detail to the table. Use a sharp router bit and back the leg with a piece of scrap to guard against blowout.

SCHEDULE OF MATERIALS: SIDE TABLE

No.	Let.	Item	Dimensions T W L	Material
4	A	Legs	1 1/4" x 1 1/4" x 33 1/4"	Wenge
4	B	Aprons	3/4" x 1 1/2" x 12 1/2"	Zebra wood
1	C	Top	3/4" x 14" x 14"	Zebra wood

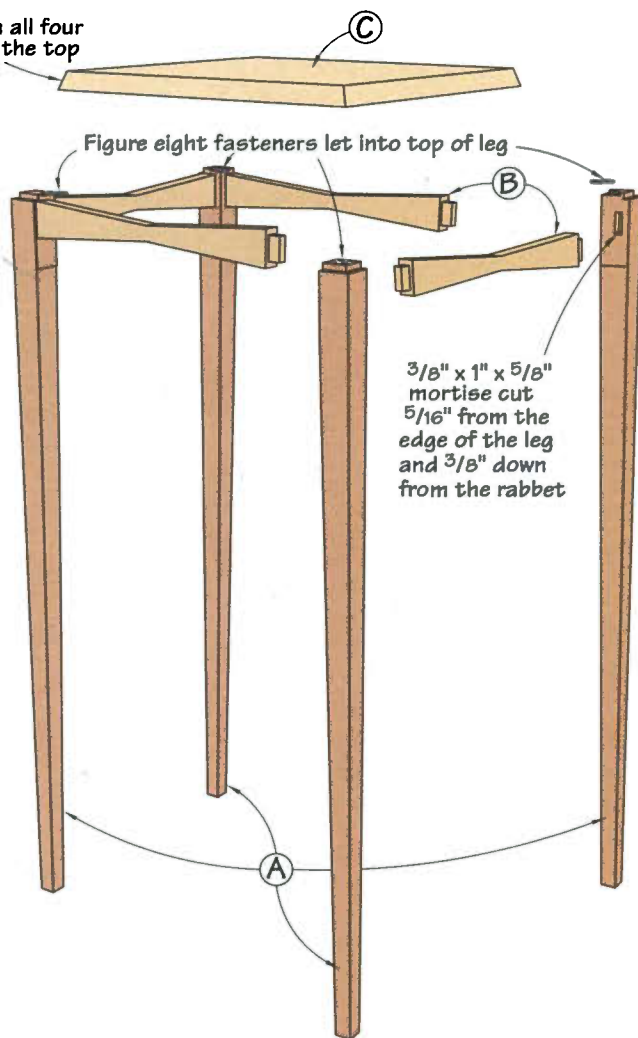
For optional sofa table:

No.	Item	Dimensions T W L	Material
4	Legs	1 1/4" x 1 1/4" x 33 1/4"	Wenge
2	Aprons	3/4" x 1 1/2" x 12 1/2"	Zebra wood
2	Long Apr	3/4" x 1 1/2" x 47 1/2"	Zebra wood
1	Top	3/4" x 14" x 49"	Zebra wood



A tapering jig makes this step fairly cut-and-dried, but don't get so comfortable that you don't pay attention to which face the mortises are on. It's easy to taper the wrong face.

10° bevel on all four edges of the top



so it's a great opportunity to experiment with some exotic woods. I chose Wenge (say "wen-gee") and Zebra wood, which creates a sleek and stylish side table. And by changing a couple of dimensions, it's easy to produce a sofa table. Choose either or both table designs and follow the instructions to create your own work of art.

Start the project by roughing the legs, aprons and top to size, then mark and cut the 3/8" x 1" x 5/8"-deep mortises on the two inside faces of each leg. The mortises are positioned to hold the top edge of the aprons 1/8" down from the rabbet cut on the leg. This also puts the outer face of the apron 1/8" in from the outside of the leg. Next cut the 3/8" x 1" x 1/2"-long tenons centered on the ends of the four aprons. While I mentioned this project could be completed with minimum tools, a table saw is useful for the tenoning.

The next step is possible with a jigsaw and chisel, but I used a router table to cut a 1/4" x 1/4" rabbet on the two top outside faces of all the legs. This detail gives a "floating" appearance to the top of the table.

With the rabbets cut, use a 1/2" Forstner bit to drill a 1/8" recess on the inside corner of each leg top. This recess hides a sim-



My template jig makes this type of router procedure safe because it keeps my hands away from the bit. If you don't have such a setup, take the slow and steady route of a handplane and sandpaper to keep yourself safe.

ple "figure-eight" top fastener and provides a strong assembly, while allowing the solid top to expand and contract during seasonal wood movement. If a Forstner bit isn't part of your tool collection, a chisel can be used to remove enough material to fit the fastener.

Now taper the two inside faces of each leg using a tapering jig on the table saw. The taper starts 3" down from the top of the leg and tapers to leave a $\frac{3}{4}$ " x $\frac{3}{4}$ " foot. No table saw or tapering jig? It's a lot more work, but a smoothing plane can create the same taper.

Turning to the aprons, mark the bow tie shape on one face of each apron. The bow tie starts full-width at either end of the apron and tapers to $\frac{5}{8}$ " wide in the center. After marking the shape, use a band saw to cut each apron to shape. Cut to the outside of the line to allow a little material to clean up with a router or handplane.

Again opting for a power tool here, I made a simple pattern template jig to hold each apron as I used a straight pattern-bearing bit to clean up the edges of each apron. The pattern jig makes sense for me because I make so many of these tables, but the edge can also be cleaned up with a plane and some sanding.

At this point there are only a couple of details to take care of before assembly. Finish sand all the table pieces, gently breaking the edges and corners to leave most of the edges crisp. To add another simple detail, you can plane a $\frac{1}{16}$ " flat on the outside corner edge of each leg. The base is now ready to glue and assemble.

While the base is drying, determine the upper face of your top and use the table saw to cut a 10-degree bevel on the edges of the top to give a sloping plateau appearance. Then finish sand the top and you're ready to put a clear finish on the piece and assemble.

Once you realize how simple this table is to create, try not to tell all your friends and relatives, or they'll be begging you to make one for them. **PW**



With the milling finished, the details of the corner joint come together in a pleasant mating of exotic woods and simple joinery (left).

A simple figure-eight fastener is used to attach the top and allows wood movement without damaging the base (above).

Hand Tools

FOR

\$100

If you're a beginner and money is tight, you can buy all the hand tools you'll need to start woodworking with just a C-note.

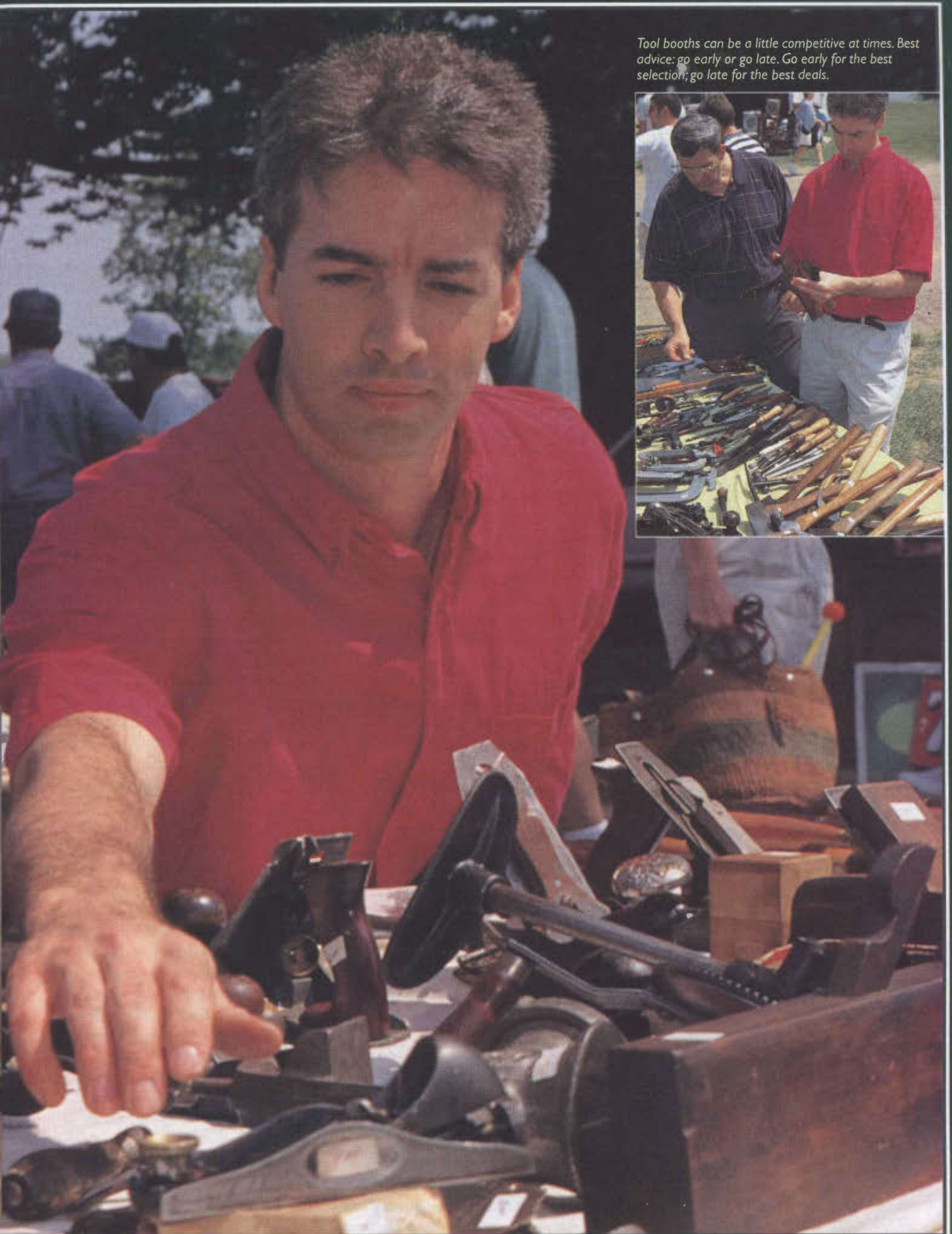
Beginning woodworkers have it bad when it comes to buying their first hand tools. First you have to figure out what tools you need to get started. Then you have a hard choice. You can buy the cheapest stuff at discount stores and risk being disappointed with the quality later. Or you can buy the nice stuff from catalogs and specialty woodworking stores that is considerably more expensive. However there's a third option that few beginning woodworkers consider: buy used hand tools.

Flea markets, garage sales and antique malls are usually awash with quality used hand tools at reasonable prices. A #4 Stanley smoothing plane that costs \$57.50 new in the box can be had for \$15 to \$20 used. Wooden handled chisels that average about \$10 each new can be bought for \$5. There are some downsides to buying used, though. If you're not happy with your purchase, it's unlikely you can get a refund. And some used tools need restoration before use. But if you follow the guidelines in this article, you can minimize the amount of time you'll spend fixing up your old tools and quick-

by Christopher Schwarz



Tool booths can be a little competitive at times. Best advice: go early or go late. Go early for the best selection; go late for the best deals.





Beginning woodworker Ed O'Connell checks out some of the tool bargains at an antiques market in Kentucky. While you can find used tools at garage sales and antique stores, open-air markets like this always seem to be the most fruitful.

ly put your new toys to work.

Let me first say that buying used isn't for everyone. It's unlikely you'll be able to go to one flea market on a Saturday morning and equip your entire shop. So you're going to have to shop around. And for many people there's something inexplicably appealing about owning a brand new tool. But if money is tight and you've got a few weekends free, it's entirely possible to equip your shop with all the basic hand tools for less than \$100.

Your Shopping List

First figure out what you need to get started. Even if you're a power tool junkie you're going to have to buy about 20 hand tools (until they invent an electric scratch awl). If you're inclined to do all your work with hand tools, this list is still a great place to start — you'll be able to do a lot of things with these tools. The chart below is a decent shopping list with some average flea market prices that we've seen in the Midwest, South and East. When you go shopping, be sure to take a list of the tools you need, a good-quality steel ruler marked in inches and a pencil.

There are four places to find good used tools: auctions, garage sales, antique malls and flea markets. Auctions are great because you can sometimes pick up an entire box of tools for \$20. The prices are reasonable because this is where many flea market vendors purchase tools to sell. But auctions are time consuming. You can sit

all day waiting for the tools you're interested in to come up for sale. And even then you might lose to a higher bidder and end up only with a few extra pounds from all those pimento cheese sandwiches you ate.

Garage sales are nice because the person running them might have no idea how to price the tools. I've found good hand planes at yard sales for \$5. Problem is you usually have to drive all over town to find a garage sale that may or may not have tools for sale. And most garage sales have just a few tools for sale. Antique malls, on the other hand, are nice because there are usually lots of tools to choose from. But you have to pay for that convenience. Prices can be higher than those listed here and there's little chance to bargain.

I prefer the flea markets. There are lots of tools to choose from, there's no waiting around and the prices are low, especially if you are willing to haggle.

Chisels

You've gotta have chisels. From squaring up rabbits cut with your router to paring dovetails, chisels are a necessity. Luckily, used chisels are easy to find and inexpensive. The nice thing about used chisels is that the majority of them have wooden handles, which I'm partial to. The downside to used chisels is you're going to have to grind the cutting edge back to square. I've never seen a used chisel that didn't need work.

But don't get too worked up about that. Many new chisels need to be reground

right out of the box, too. So when you're looking to buy a used chisel, here's what to keep in mind. First measure the chisel with your steel ruler to make sure it's a size you need. Look for chisels that aren't too rusty, especially on the back. Surface rust is OK, but if there are deep pits on the back of the chisel, you'll have a lot of flattening to do before you can get a decent cutting edge. Rust on the front isn't a big deal, as long as it's not too severe.

How much of the blade is left is also important. Unless the chisel is a butt

SHOPPING LIST

Tool	Low price	High price	New price ‡
Wooden-handled chisels			
1/4" chisel	\$4	\$7	\$7-\$11
3/8" chisel	\$4	\$7	\$7.25-\$11
1/2" chisel	\$4	\$7	\$7.50-\$11
5/8" chisel	\$4	\$7	\$7.50-\$11
3/4" chisel	\$4	\$7	\$8.50-\$11
1" chisel	\$4	\$7	\$9.50-\$11
Wooden-handled mortising chisels			
1/4" chisel	\$5	\$7	\$16
3/8" chisel	\$5	\$7	\$17
Backsaw*	\$5	\$15	\$19-\$50
Coping saw	\$5	\$7	\$6-\$10
Low-angle block plane	\$7	\$18	\$45
#4 Smoothing plane	\$15	\$20	\$54
Scraper †	\$5	\$5	\$5
Mill bastard file	\$1	\$2	\$6
Burnisher	\$3	\$5	\$10-\$20
Screwdrivers	\$2	\$3	\$3 each
Combination square	\$5	\$25	\$20-\$65
Scratch awl	\$2	\$7	\$5-10
Marking gauge	\$4	\$8	\$10-\$40
Sliding bevel gauge	\$5	\$8	\$16-\$20

* I recommend buying a new backsaw. Read why in the story.

† You're unlikely to find a used scraper. Buy a new one.

‡ Prices for "new tools" are for tools comparable in quality to what you'd find used.

Chisels are plentiful, so you can be picky about the quality and price. Here a couple chisels sit among some carving tools—another common item at shows (right).

Always take a ruler when buying tools. You need only one $\frac{3}{8}$ " chisel for your toolbox (below).



chisel (which is supposed to have a short blade) you should have at least 3" to 4" of blade remaining. If you've got less, you might not have any tempered steel left in the blade and the chisel won't hold an edge. Pass.

Now check out the handle. Can you pull the handle out of the socket? If you can, you'll need to fix that or turn a new handle. Follow the same rules with mortising chisels, which have considerably thicker blades and no bevel on the sides. In addition, make sure these look like they can take a lot more abuse, such as getting whacked by a hammer every day.

Backsaw and Coping Saw

You need a backsaw for cutting dovetails and tenons, and other small work. Backsaws are so named because they have a rigid spine clamped to the back of the blade that stiffens the blade during the cut. Larger backsaws are called tenon saws. Smaller ones are called dovetail saws. And little ones with a round handle are often called gent's saws. You'll find a lot of saws for sale, but they usually need a lot of work, such as fixing missing teeth and sharpening. Let a professional do this for you.

If you're not an old tool purist, I recommend you buy a new Japanese-style backsaw. Lee Valley Tools, for example, sells a great Korean-made Dozuki backsaw for \$18.95 (item# 60T55.01 • 800-871-8158). I like Japanese-style saws because they cut

on the pull stroke, instead of the push stroke, so they're easier to control. Plus the kerf is considerably thinner than Western saws.

Coping saws are simple tools that are great for cutting curves and cleaning out waste between dovetails. Make sure a used one is fully adjustable. That is, you can lock the blade at any angle. Buy some new blades for about 30 cents each at the hardware store that have 15 teeth per inch.

Planes

You'll need a low-angle block plane for lots of stuff. For example, when you've glued up two pieces of wood and one edge is slightly proud of the other, a low-angle block plane is great for leveling the joint.

You'll usually find two kinds of block planes for sale: one is your plain old block plane, the other is a low-angle block plane. Block planes have the blade set at about a 20-degree angle to the sole. The blade in the low-angles is set at 12 degrees. Low-angle planes will cut everything that a block plane will, and they work better on planing end grain and highly figured woods. So try to buy a low-angle version if you can.

You also want this tool to have an adjustable throat. The throat is the opening between the blade and plane body. It's important that this is adjustable because the thinner the opening you can create, the less tearout you'll get—especially in figured woods. To see if a block plane has an adjustable throat, unscrew the front knob on the plane and try to wiggle the piece of

metal on the sole in front of the blade. If it moves, your throat is adjustable.

Another issue with used block planes is the blade itself. Look for one that's not too rusty and has some life left in it. New block plane blades are about 4½" long. If yours is considerably smaller, you might be in for trouble. Replacement blades for some block planes can be tricky to find, especially for oddball brands. It's safe to pass on block planes with stubby blades.

Now check the plane bottom for flatness. Hold your straightedge—edge on—against the sole of the plane and up to a light. If you can see some significant gaps between the ruler and sole, you could be in for a lot of work. Flatter is better.

Another nice feature in block planes is called "lateral adjustment." This allows you to pivot the blade slightly to the left or right to get a perfectly square cut. Lateral adjustments aren't the same on all planes so look for a lever on the back of the plane that moves the blade left or right.

Smoothing planes are useful for heavy-duty planing. If you have a rough-sawn edge on a board, a smoothing plane can dress it. You also can use it for the final smoothing of rough-sawn lumber. Most smoothing planes, especially those made by Stanley, will have a #4 on them. If you can't find a #4 plane, a #3 or a #5 will also serve you well as a first all-purpose plane.

Many of the same rules for block planes apply to smoothing planes, except smoothing planes do not have adjustable throats.



A couple of decent block planes. The one on the left was tempting because it was a bargain; however it didn't have an adjustable throat and it was a standard block plane, not the low-angle version. The plane on the right was priced at \$18, which is OK for a low-angle block plane with an adjustable throat. The small shiny ring below the front knob of this plane moves the throat forward and back.



Ed checks the sole of a smoothing plane to see how flat it is. You can flatten plane bottoms using a slab of glass, some kerosene and 90-grit silicon carbide (available in many woodworking catalogs). However, the more light you can see under that ruler, the more work you'll have to do to flatten the sole.

Instead they have adjustable frogs. The frog is the piece of metal that the blade sits on. By moving it forward you can close the throat. Look for a frog screw at the back of the plane. Planes without this screw are still somewhat adjustable, but it's more of a pain to accomplish.

A WORD ABOUT WHITE ELEPHANTS

There is something magical about finding a mint-condition tool at a flea market that sends all reason into a tailspin. A few months ago I was looking at two #4 smoothing planes in a shop in Florida. Both were Stanleys. One was obviously very old but looked so sparkling new that it could have had robot dust on it. Price \$63. The other one was cruddy and used and only \$23. Like a crow that's drawn to bright and shiny objects, I was mesmerized by the pretty one, even though it was way too expensive.

Then I came to my senses. I checked the sole of each plane with a straightedge. The old plane was almost perfectly flat. The shiny one was horribly warped, twisted, you name it. It was unusable, except as a paperweight. So if you see a shiny tool at a flea market be careful. There's a reason that tool might never have been used. It could be that it was born a piece of junk.



Look for a frog adjustment screw when picking out a smoothing plane. This screw moves the frog forward and back, which opens and closes the throat of the plane.

Scrapers

Scrapers are simply a piece of hardened metal that have a special burr on them. These useful tools work like supercharged sandpaper and can flatten tabletops and remove glue squeeze-out. I have yet to see a used one for sale. Buy a new one. You'll also need to buy a mill bastard file and burnisher to sharpen your scraper. Mill bastard files will be marked as such. Burnishers look like a metal magic wand with a wooden handle.

Combination Squares

The combination square is a constant companion to the woodworker. It can lay out joints, draw lines parallel to the edge of a board, draw 45-degree miters and set up all your machinery. So be careful when you buy one. I usually look for a Starrett-brand square. They cost more (\$25 used; \$57 new), but they're worth every penny. Other squares are serviceable if money is tight. Here's what to look for.

First make sure your square is still square. Put the square against the edge of a piece of wood and mark a line. Now turn the square over and mark a second line very close to the first. If the lines are parallel, your square is square. Otherwise pass.

Make sure you can lock the blade down tightly. If you find one that passes all these tests, don't think about it, buy it. Good squares are hard to find.

Marking Gauge

The marking gauge lays out mortises, tenons and dovetails. A pin on one end of the gauge marks the wood while the head determines where that mark is made.

Look for a marking gauge with a pin that hasn't been ground out of existence. Some gauges have two pins. These are nice

for laying out mortises and tenons. If you find one of these, consider it a bonus. Also, make sure you can lock the fence tightly on the beam.

Sliding Bevel Gauge

These handy contraptions are useful for transferring angles from one place to another. Say you need to set your table saw's blade to a particular angle that matches a piece on your project. Adjust the bevel gauge to the angle on the project and lock the blade down. Now put the gauge against your table saw's blade and tilt it until it fits perfectly against the bevel gauge.

There are two things to look for. First make sure the blade isn't too rusted or warped. You want it to be as straight as possible. Second, make sure you can lock the blade down tightly so it won't move if you bump it slightly.

Bargaining

Some people love to haggle; others won't do it except when buying cars. I'm indifferent, but I can almost always get a better price one of two ways — without being



The rust on this sliding bevel gauge isn't much to worry about. Be more concerned with the gauge's ability to lock down.

rude. First, assume they'll come down about 15 to 20 percent on most items, then offer that much. If a plane is \$25, offer \$20. They'll almost always take it. Second, buy two or more items from the same dealer. Usually the price becomes more flexible. I once bought a \$25 plane, a \$25 combination square and an \$8 bevel gauge for \$40 — 31 percent off.

One more thing: prices at flea markets usually go down as it gets closer to quitting time. Sure the selection ain't as good, but if you're ready with cash, the dealer won't have to pack up the item for his next show. You just might get lucky. **PW**

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GREENE BROTHERS

Hall Bench



Arts & Crafts
furniture isn't all austere
and chunky.

This hall bench from the
Blacker House shows the movement
at its most graceful.

This will upset some of the purists out there, but I think that some of the best designs in the Arts & Crafts style came from the fringes of the movement. Instead of Gustav Stickley's massive and square forms, I prefer art nouveau-influenced furniture from Scotsman Charles Rennie Mackintosh. And instead of the squarish Lifetime furniture, I've always liked the Asian influence in the furniture and architecture of Charles and Henry Greene.

This bench from the Brothers Greene was designed and built in 1907 for the Robert R. Blacker house in Pasadena, Calif. The story behind this house is a sad one. As the furniture designed for the house went out of style, most of it was sold at a yard sale in

by Jim Stuard

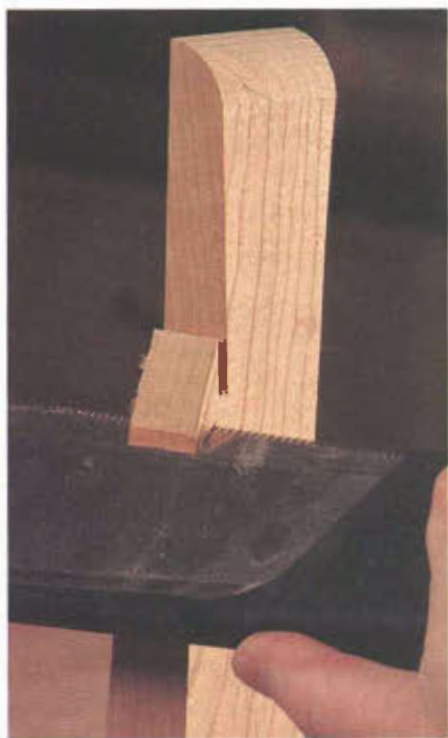




The templates for the slats are provided on the scaled-down grids. After enlarging them, lay out the templates on your wood, cut the tenons on the end of the board and band saw the slats to shape.



While the slats can be sanded smooth, I find that a spokeshave helps remove irregularities left by the band saw. It also gives the piece a hand-worked appearance.



Notching the back leg to fit the back rail is a little tricky, so take the time to do it right. This joint is one of the most noticed features of the piece.

1947. Then, in 1985, the house was purchased and within three days was stripped of most of its lighting fixtures, stained glass windows and door transoms. These were sold piecemeal to collectors all over the world, quickly recouping the \$1 million price of the house. Though new owners have taken possession of the house and a strong effort is being made to reclaim the original pieces, many can only be seen in photos, or as reproductions.

This bench is as faithful to the original as I could manage, including the reed-like design of the back slats that lend a lightness not often seen in the Arts & Crafts style. The construction is a blend of modern and traditional. And while the original was made of teak, I chose cherry.

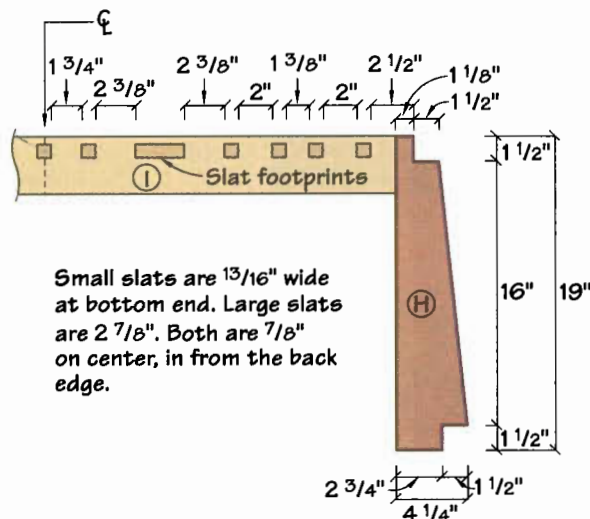
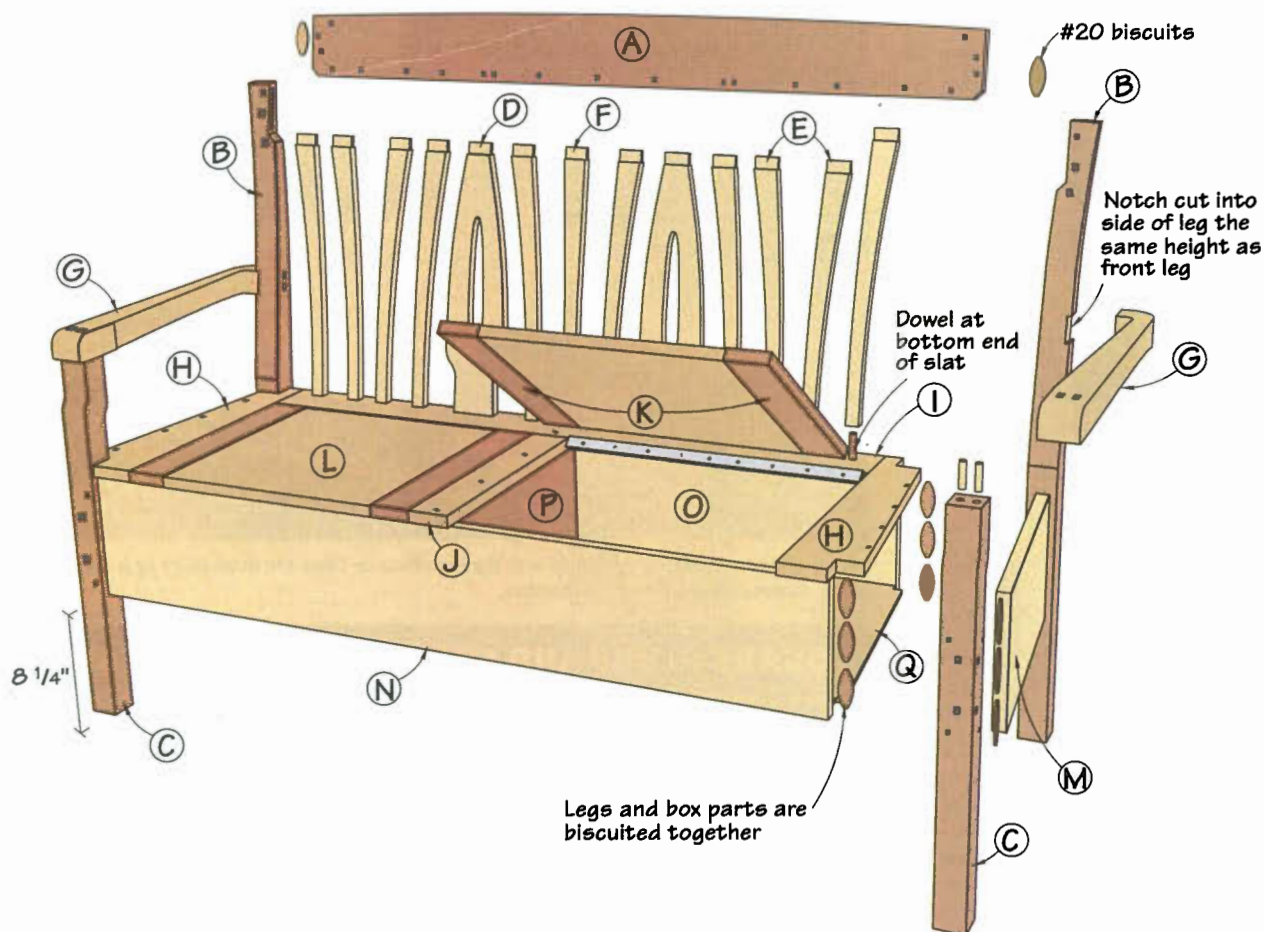
The Case of the Chair

Because this project is a mix of case construction and chair building, you'll use techniques from both disciplines. Begin construction by cutting the parts according to the Schedule of Materials. The most difficult step is getting the joint between

the back legs and top rail right. It's a specialized coped-miter that requires patience.

The front legs can be cut from $\frac{3}{4}$ " material, while the back legs are cut from a laminated blank glued up using scarf joints. I used three pieces of $\frac{3}{4}$ " cherry for each back leg, with the back section cut from the longest piece to avoid showing a visible seam. Start shaping the legs by cutting the profile first. Cut the top radius on the back leg after the back is assembled. Next cut the outside radius of each back leg on the elevation face. Before cutting the curve on the inside edge, lay out and cut the coped miter for the top rail according to the diagram. The straight inside edge gives a better reference for laying out the coped miter. Then rout a $\frac{1}{4}$ " radius on the visible corners of all the legs. Now cut out the arms on the band saw.

To form the storage area, the box ends need a 6-degree bevel on the front and back edges, and a $\frac{1}{4}$ " x $\frac{1}{4}$ " groove for the bottom that's cut $\frac{1}{2}$ " up from the lower inside edge. The same groove is necessary on the front and back box pieces. After



Plan of seat frame end "H" and slat layout on seat frame back "I"

SCHEDULE OF MATERIALS: GREENE BROTHERS HALL BENCH

No.	Ltr.	Item	Dimensions TW L	Material
1	A	Top rail	3/4" x 4 5/8" x 45 1/2"	Cherry
2	B	Back legs *	2 3/4" x 4 3/8" x 40"	Cherry
2	C	Front legs	1 3/4" x 2 1/8" x 23 3/4"	Cherry
2	D	Large slats	5/8" x 4 1/4" x 18 1/4"	Cherry
10	E	Small slats	5/8" x 2 1/4" x 18 1/4"	Cherry
1	F	Center slat	5/8" x 1 1/2" x 18 1/4"	Cherry
2	G	Arms	1 3/4" x 2" x 20 7/8"	Cherry
2	H	Seat frame ends	3/4" x 4 1/4" x 19"	Cherry
1	I	Seat frame back *	3/4" x 3 1/2" x 41 3/8"	Cherry
1	J	Seat frame center	3/4" x 2 1/2" x 15 1/2"	Cherry
4	K	Bread board ends †	3/4" x 2 1/2" x 15 1/2"	Cherry
2	L	Lids †	1 1/16" x 15 1/2" x 14 7/16"	Cherry
2	M	Box ends	3/4" x 8" x 16 3/16"	Cherry
1	N	Box front	3/4" x 8" x 46 7/8"	Cherry
1	O	Box back	3/4" x 8" x 43 5/8"	Cherry
1	P	Divider	3/4" x 7 1/4" x 17"	Cherry
1	Q	Bottom	1/4" x 17 1/2" x 48 1/2"	Plywood

* Rough length

† Requires fitting after assembly

5/16" x 5/16" x 30" and 7/16" x 7/16" x 20" of ebony plug material

1 - Antique-brass continuous hinge 1 1/2" x 48" cut into 19" lengths

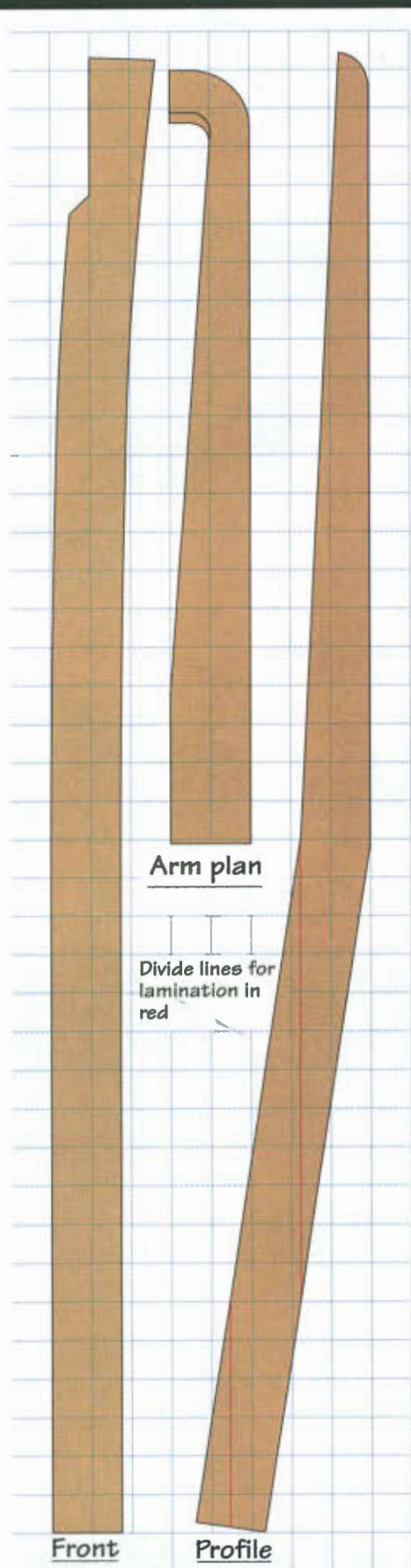
making these cuts, mark and cut biscuit slots to attach the front and back legs to the box ends. Make the slots to hold the end panels recessed 1/2" in from the outside of each leg.

The next step is to cut a 1/4" x 3/4" tenon on the top end of the boards from which the slats will be cut. On the bottom end

of the boards, cut a 7-degree bevel to allow the slats to lean to the back, so the long part of the bevel should face forward. Next, cut out the slat shapes on a band saw and use a scroll saw for the centers of the two spade-shaped slats. Then clean up the rough edges with a spokeshave.

Making Ends Meet

You're now ready to dry-assemble the bench frame. Use biscuits again to attach the box front and box back between the legs. Make sure the angles are correct and the bottom fits. Then cut the top rail to length and clip the corners at a 45-degree angle to fit between the legs and biscuit it in place.



Front/profile of back leg and arm plan

Each square = 1"



I made a simple mortising jig to help with the breadboards. Once the three-piece jig is done, a plunge router makes simple work of the mortises.

SQUARE PLUGS AND SQUARE HOLES MADE SIMPLE

There doesn't seem to be any rhyme or reason to the plug locations used by Greene and Greene, except that the plugs were symmetrical. Used ostensibly to hide screws, nails and other fasteners, there should be plugs at all of the major joint locations. There are two sizes of plugs, $\frac{5}{16}$ " square and $\frac{7}{16}$ " square. This is the fastest and easiest way to do this.



If there's a nail in the location of the plug, set it as deeply as you can.



Now drill a hole (either $\frac{3}{8}$ " or $\frac{1}{4}$ " in diameter) that's about $\frac{3}{8}$ " deep.



Now square the hole. I bought inexpensive steel bar stock from my local home center ($\frac{7}{16}$ " square and $\frac{5}{16}$ " square). Then I tapered one end on my grinder. Tap the bar stock into your round hole and it will become a square hole.



Put a small dot of glue in the hole and tap your ebony plug in place.



Use a piece of cardboard as a spacer between your work and a flush-cutting saw. Cut the plug and then sand it slightly so there's still a raised bump.

The next step is to notch the back legs for the arms. Use the front legs as a guide. The notch is $\frac{1}{4}$ " deep by the size of the arm's end. Mark and drill for dowels to attach the arms to the top of the front leg. Also drill clearance holes in the back legs to screw the rear of the arm to the back leg from the inside of the leg. With the bench still dry-assembled, go ahead and lay out and drill $\frac{3}{8}$ " dowel holes for the slats.

After resolving any fitting problems, cut a $\frac{1}{4}$ " x $\frac{3}{4}$ " groove into the center of the bottom edge on the top rail. This will hold the slats' tenons. Then glue the bench together for real. Start by nailing the divider in place between the box front and back, holding the top edges flush. Then put glue on the biscuits and fit the legs onto the box parts, fitting the slats and top rail in place at the same time. There are a lot of pieces to align, but the glue will allow you about five minutes to check the slats before it starts to set.

The next step is to assemble and attach the seat frame. Biscuit the back and center pieces together, and then nail the frame in place to the assembled box. After everything is dry, cut the radius on the top rail and leg ends. Rout a $\frac{1}{4}$ " radius on all the edges of the top rail and smooth it out.

Breadboards and Lift Lids

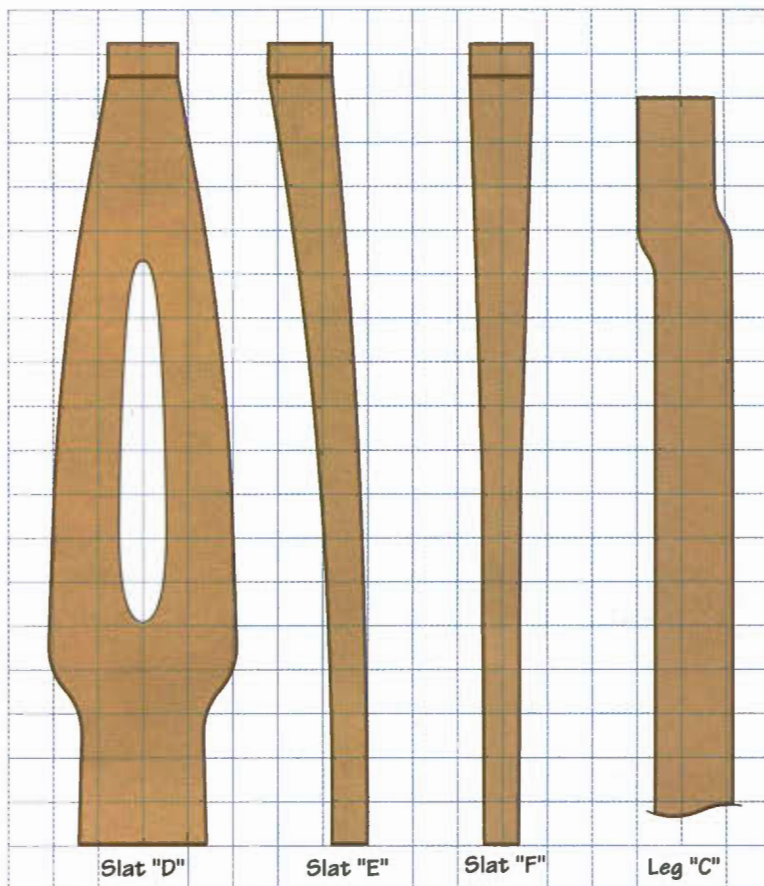
The last step in assembling the bench is to make the lift lids with breadboard ends. These provide a seat and lid for the storage area below. Begin by gluing up two panels for the lids. Breadboards have been around for hundreds of years as a means of stabilizing a panel as it goes through humidity changes each season. Breadboards can be made in many ways that involve complicated joinery. I chose a method that is simple, and gives an authentic

look. Rout three mortises in each breadboard 1" deep by $1\frac{1}{2}$ " long. Use a chisel to square out the mortises. The breadboard ends are a little long so cut them to length after attaching them to the panel with #10 x 3" pan head screws. When you're happy with the fit of the breadboards, tap fitted plugs in place with glue. Trim and sand the plugs flush. Attach the lids to the bench with continuous hinges.

Planting the Plugs

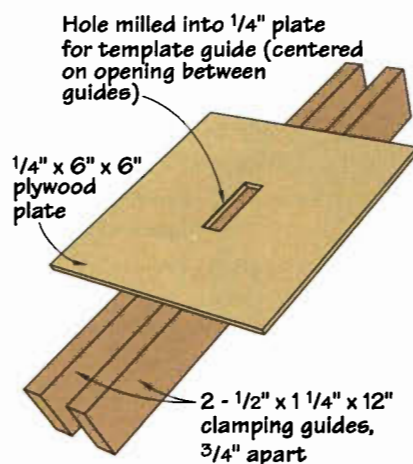
The finishing accent for this piece, and one that is a trademark of the Greene and Greene style, is to add ebony plugs to many of the bench joints. See the box on the previous page for a handy way to

With the mortises cut in the breadboard ends, an elongated clearance hole is cut at the bottom of the mortise. The breadboards are then screwed in place and capped with the rectangular plugs as shown.



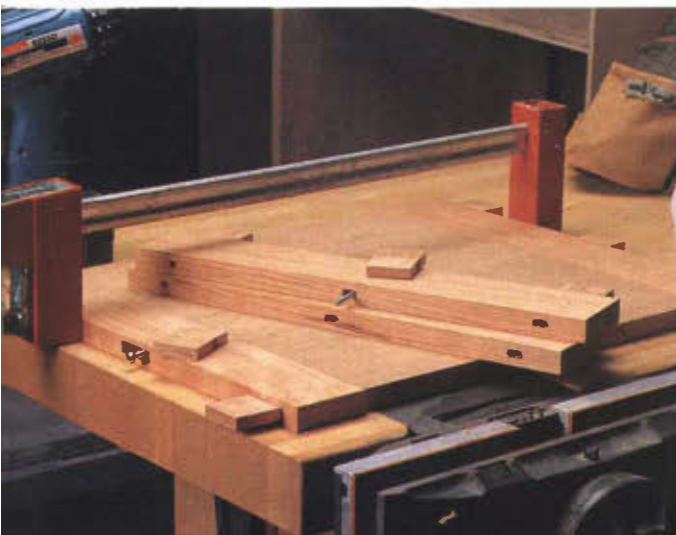
Back slats and leg profile

Each square = 1"



Routing jig

do this. Adding color to this bench isn't terribly difficult. It does take a little patience. First color the wood with Moser's Light Sheraton Mahogany dye (available from Woodworker's Supply 800-645-9292, item #W13304, \$11.90 for 4 ounces of powder). Allow it to dry. Apply one coat of clear finish. Then wipe on warm brown glaze (available at professional paint stores) and wipe the bench with your rag until most of the bench is colored evenly. Allow that to dry overnight. Then complete the process with two coats of a clear finish. **PW**





guest
room

Murphy Bed



Don't waste space
in your guest room.

Use it as an office or den
when company leaves.

My mother-in-law visits about twice a year. I happen to like her, so it was out of the question to make her sleep on a lumpy hide-a-bed. But I also didn't want to give up an entire room in my house to twice-a-year use. To compromise I opted for an idea born in the early 1900s — the Murphy bed. It's a handy guest bed when needed, but the bed folds into the wall and gives your house a bonus room.

The design of this piece is best described as "classic contemporary." To me it just looks nice. Probably the trickiest step is the columns. Everyone at *Popular Woodworking* knows I'm not a fan of the lathe (great tool, I just don't like to use it), and I went out of my way to build the columns without turning a thing. I'll show you how later.

The rest of the project is simple case construction. The "magic" of the bed is store-bought. There are a number of Murphy bed mechanism kits available, but I prefer the piston operation of this

unit. Though it's expensive at \$185, the kit includes a comprehensive set of instructions for building the center bed section of the unit.

Construction begins with the purchase and review of the bed mechanism kit. This center section determines the height and depth of the side cabinets. Once your dimensions are set, head to the saw. You'll need about five sheets of $\frac{3}{4}$ " plywood (two sides good), and two sheets of $\frac{1}{4}$ " plywood (which seems impossible to find two sides good, but if you can, great.) Choose the best pieces for the bed panel and the outside ends of the unit. Cut the panels to the sizes given in the Schedule of Materials, then go get your iron.

This piece uses a lot of iron-on veneer tape. The other option was solid wood edging, which is a lot more work.

First, cut and assemble the seven "L" braces and side frame rails that support the mattress. The location of one of the braces is critical to the hardware for the legs.

—Photo by Pam Monfort, Bronze Photography

by David Thiel & Gregory Crofton

NO LATHES FOR ME!

There is turning involved in the columns, and it was done by Midwest Dowel Works (800-555-0133), which sold me 2" x 4' poplar dowels (#LD-2000) for \$18.13 apiece. The rest took some thinking, a table saw, a band saw, a router table and some sanding. A disc sander is handy, but you can do without. The four column caps come from a piece of 1 1/2" thick maple. Cut blocks 3 1/2" x 3 1/2", then mark a point centered from left-to-right and 1 1/2" from one edge. Mark this edge as your reference edge. Drill a hole at the intersection, then make a simple circle jig by driving a nail into a board 1/4" from one edge. Clip off the nail head. By clamping the board to the band saw with the nail 1/2" from the 1/8" blade (leave a little extra room for sanding) you can turn fairly accurate circles. Repeat this step in 3/4"-thick maple for the eight column-base spacers. By using a 3/8" roundover bit chucked into by router table, I was able to turn a decent bead on the edges of the spacers. I then switched to a cove bit and ran a nice lifting detail to the underside of the caps. The octagonal pedestals were actually the easiest step. Starting with a 3" x 3" x 6" maple block, I set my table saw to a 45-degree angle and set the blade to cut a 13/16" chamfer face. By rotating each block four times, the octagonal pedestal formed quickly. After careful sanding (there were a couple of burn marks) I nailed the base spacers to the pedestals, then doweled the larger 2" dowels between the base assembly and the cap.

One of the base spacers is marked and drilled for circle-cutting. The jig is clamped in place on the band saw (first).

By turning the piece slowly and using an appropriately thin blade, which is tensioned correctly, fairly consistent circles can be achieved (second).

Using the same jig clamped to a combinations belt/disc sander, the band saw blade marks can be removed easily and the discs made even more uniform (third).

Using bearing-mounted bits and a clipped stop block clamped to the table, the spacers and caps can be shaped by slowly rotating the piece (counterclockwise) against the bit. Start slowly and increase the pressure as the cut deepens. I've moved the guard out of the way for the photo, but it should be right over the workpiece with 1/16" to spare (fourth).



Next, apply veneer tape to the four edges of the face panel, to the top edge and ends of the head rail and foot rail, and to the top edge of the two bed side rails and the headboard. While you're ironing, veneer the front edge of the two cabinet sides as well, then cut out the cabinet top and attach the top front and rear rails as shown in the diagram.

On this unit the poplar frame is screwed to the two bed side rails, then the frame is attached between the head and foot rails using a corner brace at the foot rail and screws through the head rail at the other end. Then I laid the frame on the face panel and screwed it in place through the braces.

Now you're ready to assemble the bed cabinet. Follow the hardware instructions provided by the manufacturer for accurate placement of the braces and hinges.

To mount the bed frame in the cabinet, first attach the cabinet top between the two sides, then slide the bed section between the sides, spreading the sides to allow the pivot hinges to slip into place. Now screw the bottom and headboard in place between the sides. Don't worry about the screws through the sides showing because the side cabinets will cover all of them except at the cabinet top, which will be visible for the front 6".

With the center section complete, the rest is face-frame cabinetry. Similar joinery is used on both the upper and lower cabinets, so cut out the pieces at the same time. The cabinet backs fit into 1/2" x 3/8"-wide rabbets cut on the back edge of the upper and lower sides. Also cut a 3/4" x 3/8" rabbet on the top edge of each lower side to attach the mounting strips.

Next, set up to run 3/8" x 3/4"-wide grooves for the tops in the upper cabinets and for the bottoms in the lower cabinets. The top grooves are located 1" down from the top of the sides, and the lower cabinet grooves are located 4 3/4" up from the floor.

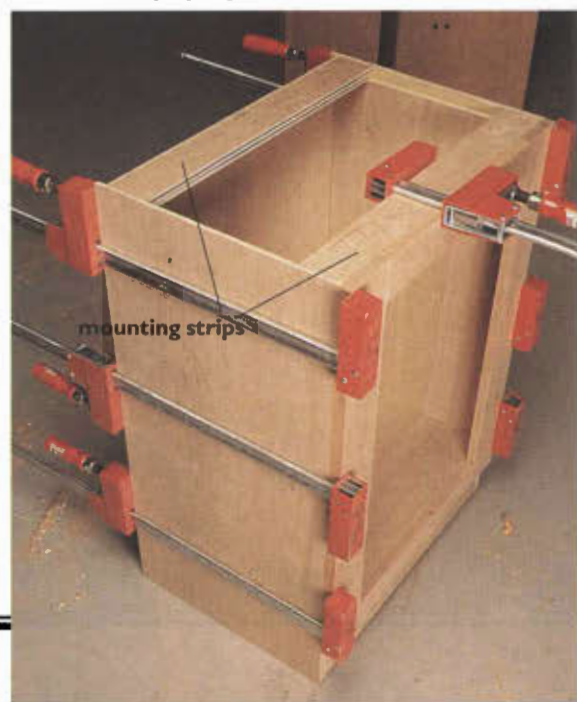
The face frame is glued to the front of the lower cabinets. The back is tacked in place to hold the cabinet square.



The foot end of the bed section shows the corner braces as well as the foot and locking hardware provided in the Murphy mechanism kit. When the feet are closed, the rods extend up into holes drilled in the cabinet top to hold the bed in place while stowed away.

When assembling the side cabinets, use screws through the inner sides into the top and bottom pieces, and glue and clamp the outer sides. Make sure to hold the tops and bottoms flush to the inside of the back rabbets. Use the backs to square the cabinets during assembly, tacking them in place with some brads that can be removed for finishing.

While the glue is drying, cut the two countertops and the solid wood edging for the front and outer side. Cut a 1/2" x 3/8" stopped rabbet on the back edge of each top to allow the upper cabinet back to attach to the tops. The front edging on each top is left 3/4" long on the inside corner to allow the edging to lip over the cabinet sides of the center section. Cut a 45-degree chamfer on the tops to form a 5/8" chamfer face, then miter the joint and glue the edging in place.



Next biscuit the face frames together and glue them to the upper and lower cabinets. The frames should flush up against the top surface in the upper cabinets and on the bottoms in the lower cabinets.

When the clamps are off, finish sand the cabinets and the countertops. Then attach the tops to the upper cabinets, screwing through the tops into the upper sides. Then attach the upper cabinets to the lower cabinets by screwing through the mounting strips.

Now put the side cabinets in place on either side of the center cabinet and attach them with 1 1/4" screws through the outer cabinet's inner sides. Hide the screws behind the face frame.

There are four doors for this unit, but only two function. The doors in the side cabinets are lipped doors, so only 1/2" of the frame extends beyond the cabinet front. To continue the facade of four actual doors, the two center doors are 1/2" thick and then

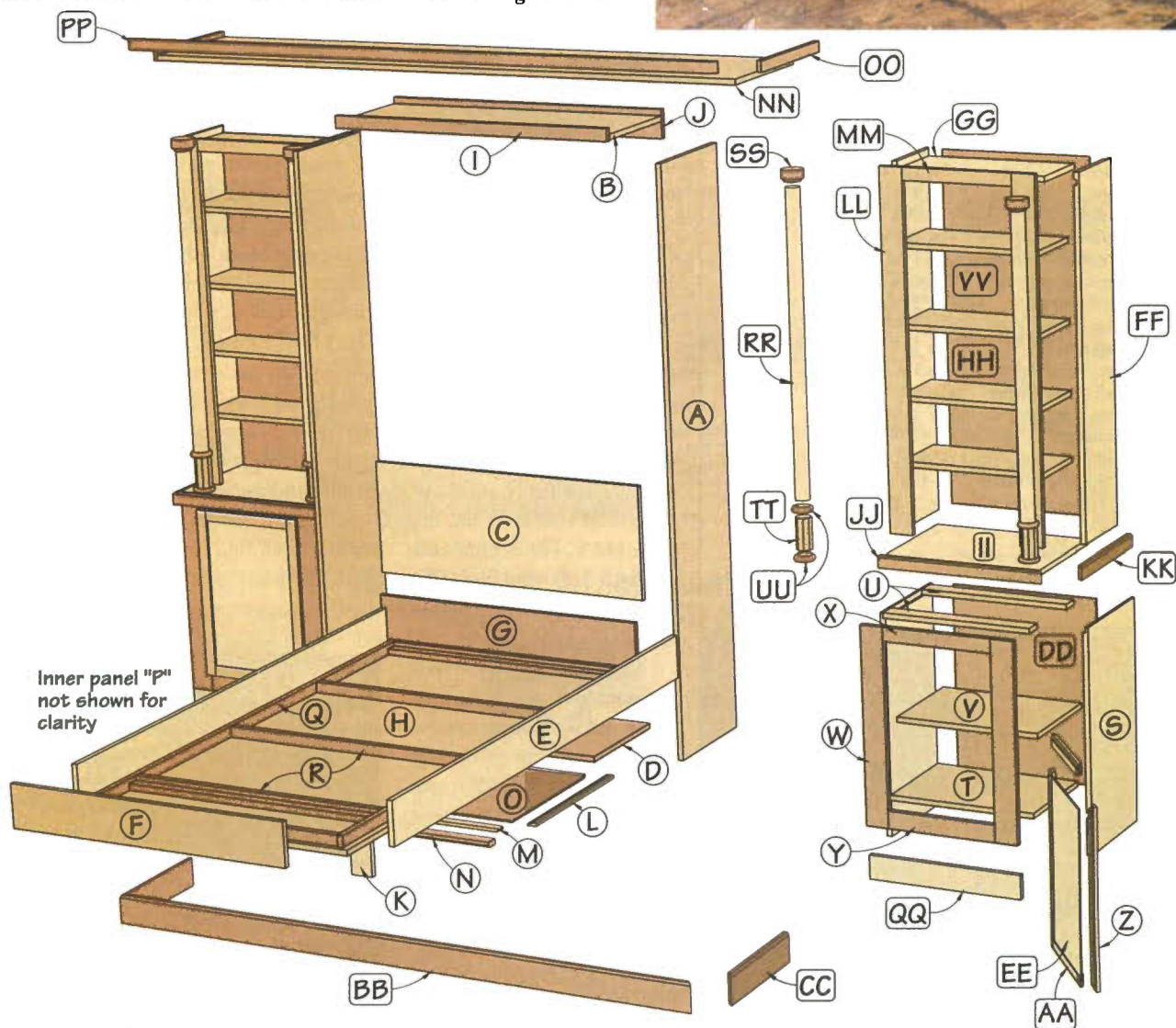
are nailed to the face panel.

I used stub tenons and grooves for the doors, allowing the 1/4" panels to float in the same groove used for the tenons. The same tenon-and-groove setup can be used on the 1/2" and 3/4" door frame pieces as long as the setups start from the outer face of each door, so the groove on the 1/2" doors actually becomes a rabbet.

To attach the center doors to the face panel, approach it as a moulding project and mount the doors in pieces as shown on the next page.

Assemble the outer doors and mount them to the cabinets. I used European hardware to hide the hinges and added

The completed countertops are attached to the assembled upper cabinets by screwing through the sides and into the face frame. Note the solid edging on the top that extends past the top to cover the center cabinet side.



SCHEDULE OF MATERIALS: MURPHY BED

Bed Center Section

No.	Letter	Item	Dimensions T W L	Materials
2	A	Cabinet sides	3/4" x 16" x 81 5/16"	CP
1	B	Cabinet top	3/4" x 14 1/2" x 41 3/8"	CP
1	C	Headboard	3/4" x 14 1/2" x 41 3/8"	CP
1	D	Bottom	3/4" x 16" x 41 3/8"	P
2	E	Bed side rails	3/4" x 6" x 75"	CP
1	F	Foot rail	3/4" x 6" x 40 1/2"	CP
1	G	Head rail	3/4" x 7 7/8" x 40 1/2"	CP
1	H	Face panel	3/4" x 41" x 76 3/4"	CP
1	I	Top front rail	3/4" x 1 3/4" x 41 3/8"	C
1	J	Top rear rail	3/4" x 4" x 41 3/8"	C
2	K	Legs	3/4" x 3" x 7"	C
4	L	Door stiles	1/2" x 1 1/2" x 24"	C
4	M	Door rails	1/2" x 1 1/2" x 14 1/8"	C
1	N	Chair rail	3/4" x 1 3/4" x 41"	C
2	O	Door panels	1/4" x 14 3/16" x 21 15/16"	CP
1	P	Inner panel	1/4" x 38 7/8" x 74 7/8"	P
2	Q	Frame side rails	7/8" x 1 1/2" x 75"	PP
10	R	'L' frame braces	7/8" x 1 1/2" x 37 1/2"	PP

Lower Cabinets

No.	Letter	Item	Dimensions T W L	Materials
4	S	Sides	3/4" x 15 1/4" x 31 1/4"	CP
2	T	Bottoms	3/4" x 14 1/2" x 21 1/4"	CP
4	U	Mounting strips	3/4" x 2 1/2" x 21 1/4"	P
2	V	Shelves	3/4" x 14 3/8" x 20 3/8"	CP
4	W	Face frame stiles	3/4" x 3 1/4" x 27 7/8"	C
2	X	Upper face rails	3/4" x 1 7/8" x 15 3/8"	C
2	Y	Lower face rails	3/4" x 2" x 15 3/8"	C
4	Z	Door stiles	3/4" x 1 1/2" x 24"	C
4	AA	Door rails	3/4" x 1 1/2" x 14 1/8"	C
1	BB	Base front	3/4" x 4" x 88 1/4"	C
2	CC	Base sides	3/4" x 4" x 16 3/4"	C
2	DD	Backs	1/4" x 21 5/16" x 26 1/2"	CP
2	EE	Door panels	1/4" x 14 3/16" x 21 15/16"	CP

Upper Cabinets

No.	Letter	Item	Dimensions T W L	Materials
4	FF	Sides	3/4" x 10 1/4" x 49 1/4"	CP
2	GG	Tops	3/4" x 9 1/2" x 21 1/4"	CP
8	HH	Shelves	3/4" x 9 3/8" x 20 3/8"	CP
2	II	Counter tops	3/4" x 16" x 22 1/8"	CP
2	JJ	Counter edging	3/4" x 1 3/4" x 23 5/8"	C
2	KK	Counter edging	3/4" x 1 3/4" x 16 3/4"	C
4	LL	Face frame	3/4" x 1 1/2" x 49 1/4"	C
2	MM	Face frame	3/4" x 1 3/4" x 15 7/16"	C
1	NN	Cap piece	3/4" x 16 3/4" x 88 1/4"	P
2	OO	Cap side edging	3/4" x 1 1/2" x 16 3/4"	PP
1	PP	Cap front edging	3/4" x 1 1/2" x 89 3/4"	PP
2	QQ	Base spacers	3/4" x 3 1/4" x 21 3/4"	CP
4	RR	Columns	2" x 4 1/4" Dowels	PP
4	SS	Column caps	1 1/2" x 3" Discs	M
4	TT	Column pedestals	3" x 4 3/8" Octagons	M
8	UU	Column spacers	3/4" x 3" Discs	M
2	VV	Backs	1/4" x 21 5/16" x 48 5/8"	CP

100 linear feet of 7/8" cherry veneer tape

CP= Cherry plywood C = Solid cherry P = Birch plywood
M = Maple PP=Poplar



The assembled upper cabinet is secured to the lower cabinet by screwing up through the mounting strips into the counter tops. Make sure you use the right length screw!

mounting blocks for the hinges to the back of the face frame. I also had to add a 1/4" x 1/2" strip to the inside of the door to support the hinge specified in the source box.

With the doors attached, cut, chamfer and attach the chair rail by screwing it from the inside of the face panel.

Now build the columns and the top cap. The cap is a piece of plywood with poplar edging nailed to the front and side edges. Round the corners at a 1 1/2" radius to soften to look, then sand and paint the piece black. The columns are explained in detail in the accompanying piece "No Lathes For Me!"

The 4" base across the front of the cabinets and on the sides of the outer cabinets has the same chamfer cut on the top edge as on the countertops. Add spacer blocks to the front of the lower cabinets below the face frame to support the

base pieces. The base should be fit and attached after finishing and installation of the cabinets to provide the best fit and to tie the cabinets together visually. Finally cut some shelves and get out the veneer tape again. I made adjustable shelves, drilling five holes per shelf at 1" intervals.

I knew that with this large a piece I didn't want a dark cherry finish. I was so pleased with this finish I want to pass it along to you. I used Pratt & Lambert's Tonetic's Eastern Red Cedar stain. It gives an even finish that makes the wood look aged but doesn't cover the intricacies of the grain. A couple of coats of a satin finish lacquer and the unit is ready to install.

The room works great as a library or reading room, and could easily become an office. But when "mom" stops by, she knows she'll be comfortable. **PW**

SUPPLIES

From Rockler, 800-279-4441

1 - halogen light set #44264, \$69.99

From Woodcraft, 800-225-1153

2 - bags of 1/4" shelf pins, #27111, \$1.99 each
1 - Murphy twin bed mechanism, #130708, \$184.99

From Woodworker's Supply, 800-645-9292

2 -pair hinges #937-086, \$4.50 a pair

From Spokane Hardware Supply, 800-708-6649, (www.spokane-hardware.com)

2 - handles #DP40-BL, \$5.46 each



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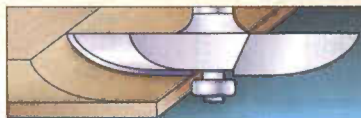
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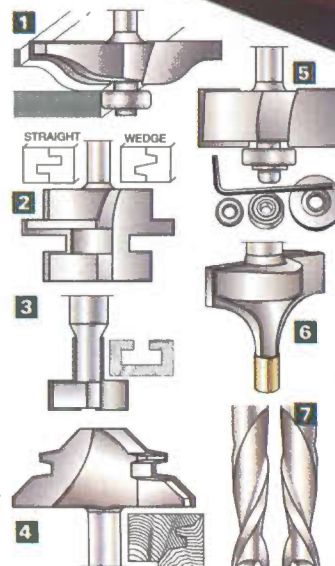
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4 LOCK MITRE BIT
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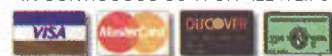
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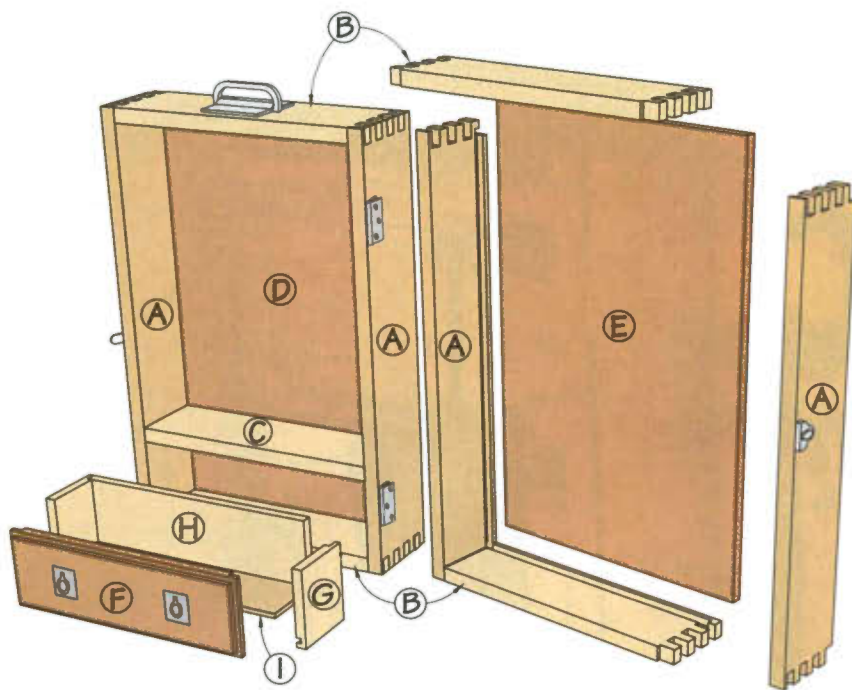
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by Christopher Schwarz



SCHEDULE OF MATERIALS: STANLEY TOOL CABINET

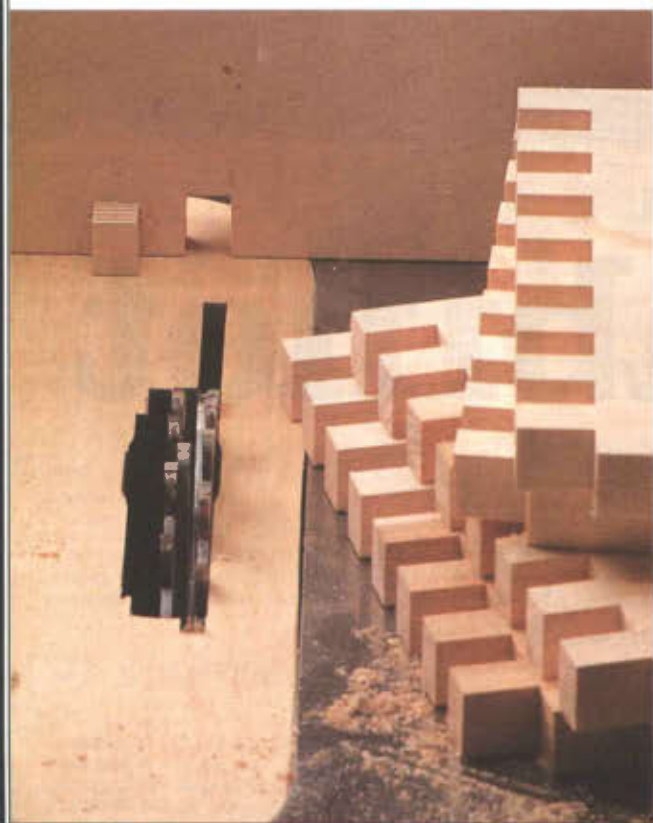
No.	Let.	Item	Dimensions TWL	Material
2	A	Sides	3/4" x 8" x 22"	M
2	B	Top & bot.	3/4" x 8" x 14"	M
1	C	Divider	3/4" x 3 3/4" x 12 1/2"	M
1	D	Back	1/2" x 13 1/2" x 21 1/2"	P
1	E	Frt. panel	1/2" x 13 1/4" x 21 1/4"	P
1	F	Drw. front	3/4" x 4" x 12 1/2"	M
2	G	Sides	1/2" x 4" x 3 1/4"	P
1	H	Back	1/2" x 3 1/2" x 12"	P
1	I	Bot.	1/4" x 3" x 12"	P

M=primary wood: maple • P=plywood

The man running the antiques booth was certain he'd found a sucker. I was fawning all over a well-preserved tool cabinet emblazoned with Stanley's "Sweetheart" logo — so called because it featured a heart with the initials "S.W." inside. As I examined the piece, the dealer dropped the price bit by bit.

Finally, I looked up at the dealer. He smiled because he smelled a sale — until I told him I'd rather build one and walked away. For the next couple weeks I tried to research the cabinet, but I couldn't find a photo or drawing of it in any of our old Stanley catalogs. The cabinet I examined looked similar to the old #862 from the early 1920s, but it wasn't quite right. So I gave up and built this one from memory and my notes. This cabinet is similar to the #862, but it's 1 3/4" deeper, has a small drawer at the bottom and is made from maple instead of a dark-stained oak. A great feature of this cabinet (and the #862)

Here's how to cut the finger joints. Put a dado stack in your table saw to make a 1/2"-wide cut. Raise your blade just a hair over 3/4". The jig is a piece of plywood screwed to the miter gauge. First attach the ply to your gauge, then make a cut in the ply using your dado stack. Now cut a small piece of plywood that's exactly 1/2" x 1/2" x 3/4". Glue and screw this block exactly 1/2" away from the cut on the plywood as shown in the photo. Cutting your finger joints is now simple (below).



is the large handle on top of the cabinet. This makes it portable when you need to take your tools on a job — or when you quit your job. Cabinetmakers are an itinerant bunch.

Construction

I built this cabinet and door as one box and then parted the front door off using my table saw. It's tricky to keep the blade from binding during this operation, but I'll show you a way to make this procedure safer. The case itself is assembled using rugged finger joints. The back panel rests in a rabbet. The front panel sits in a groove on all four sides, and the drawer divider is biscuited into place. Begin construction by cutting your parts to size according to the Schedule of Materials.

First cut the $\frac{1}{2}$ " finger joints on the ends of the top, bottom and sides. I use a homemade jig for my table saw like the one shown in the photo. Now cut the $\frac{1}{2}$ " x $\frac{1}{2}$ " stopped rabbet for the back panel on the back inside edge of the four sides. Then cut the groove to hold the front panel. The front panel rests in a $\frac{1}{2}$ "-wide by $\frac{3}{8}$ "-deep groove that's $\frac{1}{4}$ " in from the front edge of the sides. Now cut the biscuit slots for the drawer divider, which is $4\frac{3}{4}$ " up from the bottom edge of the sides. Make sure the divider is flush to the back panel when the case is assembled.

Get out your clamps and assemble the case without glue. The front panel should square up the case. Now assemble the case again, this time with glue.

Finally it's time to part the front door off the case. As I mentioned before, this can be tricky. Get out a hot melt glue gun and eight 6"-long blocks of wood. Glue two of these to the inside of each side of the box. These blocks will hold the box together, and the kerf open, as you cut the case on the table saw.

Now set your table saw's rip fence to $4\frac{1}{4}$ " and raise the blade to just over $\frac{3}{4}$ ". Make sure the back part of the cabinet is running against the fence. First cut along the top, then one side, then the bottom and the other side. Pry the blocks loose after the cut and remove the glue with a scraper.

Drawer Construction

The drawer is a simple thing that's great



Use hot melt glue to attach 6"-long blocks that keep the saw kerf open when you cut the front off the cabinet (inset). After that, ripping the cabinet is almost cake.

for holding hardware. Here's how I built it: the $\frac{1}{2}$ "-thick drawer sides rest in $\frac{1}{2}$ " x $\frac{1}{4}$ " rabbets on the ends of the drawer front. The back rests in $\frac{1}{2}$ " x $\frac{1}{4}$ " rabbets in the sides. And the $\frac{1}{4}$ "-thick drawer bottom rests in a $\frac{1}{4}$ " x $\frac{1}{4}$ " groove in the sides and front that's $\frac{1}{4}$ " up from the bottom edge. I also cut a $\frac{1}{4}$ " x $\frac{1}{4}$ " rabbet on the drawer front as a decorative detail.

Glue your drawer together, then nail the sides to the front and back. Nail the bottom in place to the back.

Now attach all the hardware. The drawer gets two finger pulls. Screw two cabinet hangers to the back so your cabinet can be hung on the wall. Don't forget the handle on the top. Also, put two screws at the bottom of the back piece to allow you to level it against the wall.

Finally, protect your cabinet with three coats of clear finish and nail the back in place. Hang it above your bench using wall



anchors, but don't make those screws too tight. You never know when you might have to change jobs. **PW**

SUPPLIES

2" butt hinges are available at any hardware store. The magnetic tool strip is available in most woodworking catalogs.

The rest of the hardware can be obtained from Lee Valley Tools (800-871-8158).

• Flush Ring Pulls (2 needed) item # 00L02.01. \$10.95 each.

• Chest Handle (1 needed) item # 06W02.01. \$11.75 a pair.

• Draw Catch (1 needed) item # 00S70.01. \$3.95 a pair.

Red Maple Rises From the Swamp

Once kept in check by seasonal burning, this species is now crowding out other hardwoods.

By Gregory Crofton

In the heyday of the American Indian, forest fires were deliberately set to clear land for hunting. These fires, and natural ones, consumed red maple, while other hardwoods with thicker bark and deeper roots, such as oak, survived and flourished.

But because of the popularity of fire suppression during most of the 20th century, red maple has been given a chance to thrive in places it never could.

Consequently, its growth has surged in eastern forests and begun to squeeze oak and pine off the land, which could have a dramatic impact on the price and availability of hardwood.

Red maple still grows in its native swamplands, but today it also lives on uplands and dry ridges. It has the greatest north-south distribution of any species in the eastern United States, from Florida to Canada.

"I think your woodcrafting people will be disappointed with the decreasing diversity of woods available to them," says Dr. Robert Peet, professor of biology at University of North Carolina at Chapel Hill. "There's no solution to this problem. You're not going to change the mindset of North Americans to be like Australians, who burn their woods every two or three years. And that's what it's going to take."

With fewer fires to abate its growth, the tree's traits have given it a leg up over other species. "Red maple is a 'super-generalist,'" says Dr. Marc Abrams, a forest ecologist and plant physiologist at Pennsylvania State University in State College, Penn. "It does many things reasonably well."



Red maple is taking control of forests it never before had a foothold in. In the photo above from a stand in northeastern Massachusetts, the large tree is an older red oak. The younger trees surrounding it are red maple, waiting to exploit a gap in the canopy.

Born in swamps, red maple is tolerant of shade. When canopies of oak and pine are cut, many times young red maples are waiting to replace the harvested trees and dominate the land.

The data gathered from a 5-acre study plot run by Duke University outside Durham, N.C., reveals the progress made by red maple. On the plot, the number of red maple trees increased from 42 to 221 in 42 years, while the number of oak trees decreased from 155 to 76.

Red maple also reproduces easily. "It's a real prolific seeder," says Dr. Kurt Pregitzer, professor of forest ecology at Michigan Technological University. "Once seedlings get established, they can persist and wait for an opening to occur in the canopy."

Red maples seed in the spring, while other hardwoods wait until the fall. It drops thousands of red and green whirlybirds, beating oak's acorns to the soil by months. These "flying" seeds are especially aggres-

Continued on page 70

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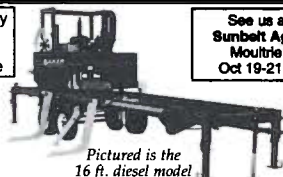
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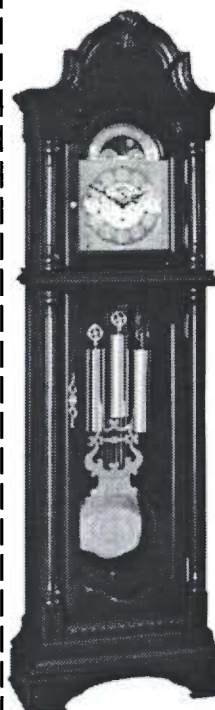
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Continued from page 68

sive on disturbed land, Abrams says.

Red maple also is a resilient tree because of its resistance to disease and insects that decimate other species. Gypsy moths love to eat oak leaves, but avoid red maple because their leaves contain alkaloid chemicals.

"I talked to some foresters in Pennsylvania, who because the gypsy moth favors oak so much, decided red maple was not a bad species to plant," says Dr. Craig Lorimer, professor of forestry at the Uni-

The most recent data from the USDA Forest Service reports red oak is the most harvested sawtimber in the eastern United States at more than 200 billion board feet per year, while approximately 65 billion board feet of soft maple, and 55 billion board feet of hard maple, are harvested.

When logging, many cutters prefer curly or wormy red maple because it sells at a higher price. "Right now there's quite a bit of interest in the wormy maple be-

RED MAPLE

(*Acer rubrum*)

OTHER COMMON NAMES:

Carolina red maple
Drummond red maple
Maple
Scarlet maple
Soft maple
Swamp maple
Water maple

GROWING REGIONS:

Red maple has the greatest north-south distribution of all species along the east coast of Canada and the United States. It is commonly found in mixed hardwood forests thriving in wet or moist soils of stream banks, valleys, swamps. Red maple can also grow in uplands and occasionally on dry ridges.

CHARACTERISTICS OF TREE:

Red maple grows rapidly the first 20 to 30 years. Once mature, it can reach a height of 60 to 90 feet and a diameter of about 30 inches.

CHARACTERISTICS OF WOOD:

The wide sapwood is white in color. The heartwood is light-brown and may on occasion show a grayish or greenish tinge or a faint purplish hue. The grain is fine textured, closed and straight, but can sometimes be curly or wavy.

FINISHING CHARACTERISTICS:

Red maple can be difficult to sand, but stains and polishes well.

WORKABILITY:

Because the wood is soft, red maple is easy to work with hand and power tools. However, it is difficult to glue and can have a dulling effect on cutters. Also, red maple is good for steam-bending.

COMMON USES:

Gunstocks, casks, kitchen cabinets, truck bodies, flooring, instruments, furniture, floor lamps and boxes and crates. It should not be used in exterior applications because it will decay and become a home for fungi and insects. In the past, the wood was burned in kilns to produce charcoal, and the bark was used to make ink and cinnamon-brown and black dyes by pioneers, according to *Woods of the World*.

AVAILABILITY:

Red maple is widespread, abundant and secure and faces no major threats. It has the greatest natural distribution of maple species in the United States.

SPECIAL FEATURES:

Although red maple is considered a soft maple, it is about 5 to 7 percent heavier than other soft maples. Its density is slightly higher than black cherry, but much lower than sugar maple. Bird's-eye figure is rare in red maple. Often markings in the wood are created by impurities that enter the wood through worm holes. This wormy wood is popular for making furniture and wall paneling.

MIDWEST PRICE:

1/4 surfaced - \$3.75 a board foot



A brilliantly colored bunch of red maple invades a 100-year-old forest of oak in central Pennsylvania.

versity of Wisconsin.

These chemicals may also be unappealing to deer who eat oak leaves all summer, only turning to red maple as a last resort in the fall.

A deer might know red maple when it sees it, but do you? As with many woods, it has a variety of names. Some call it swamp or soft maple, others call it water or scarlet maple. But when classifying maple, one distinction must be made for woodworkers. Is it hard or soft?

"Red maple as a wood is a soft maple," says Alex Wiedenhoft, research support botanist at the Center for Wood Anatomy Research at the Forest Products Laboratory in Madison, Wis. "Hard maple is really sugar maple and black maple. The soft maples east of the Mississippi, are red and silver."

Typically, red maple is not as desirable for woodworkers as other hardwoods. Its weight is comparable to others, but it's only three-quarters as strong. According to the National Hardwood Lumber Association, hard maple reaches its breaking point at 1,450 pounds, while soft maple breaks at 950 pounds.

cause character-marked wood is popular in the furniture industry," says Joe Lyle, sales manager at Western North Carolina Pallet and Forest Products. "The curly maple, the stuff that gets the figure in it, there's a strong demand for that for musical instruments."

The mill Lyle works at harvests red maples that are 75 to 120 years old, 20 to 30 feet tall and at least 12 inches in diameter. According to Lyle, the price of red maple is volatile.

"The market swings all the time," Lyle says. "It's mostly style, fashion that goes in and out, in the furniture industry. Soft maple has gone down recently in price. It's gone down 15 to 20 percent in the last six months."

Fashionable or not, it seems forests in the East won't be saying goodbye to red maple anytime soon. **PW**

Photos courtesy of Marc Abrams

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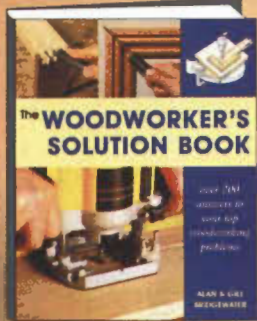
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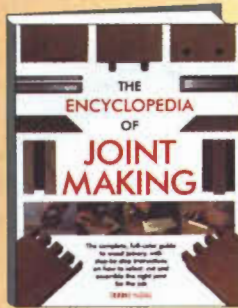
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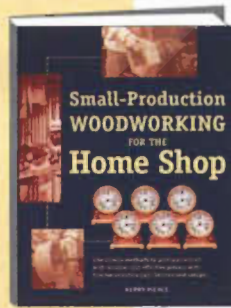
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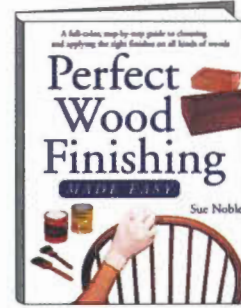
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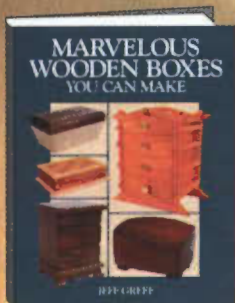
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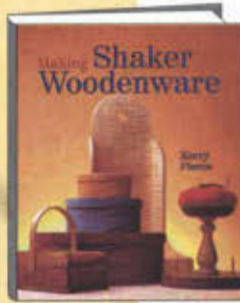
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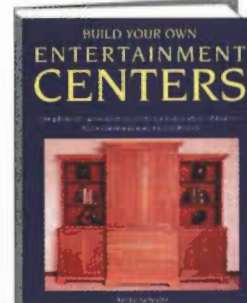
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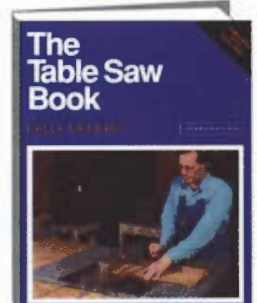
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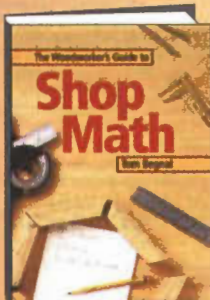
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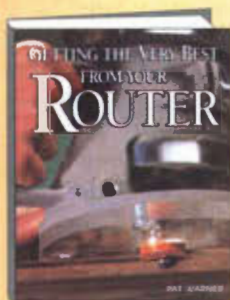
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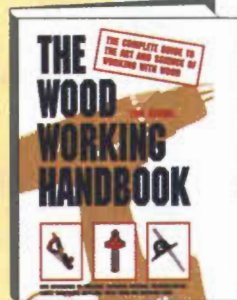
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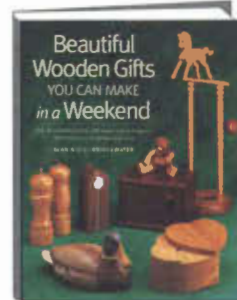
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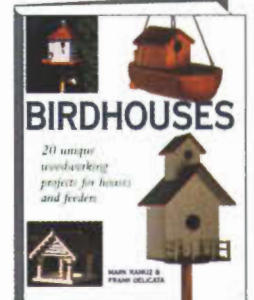
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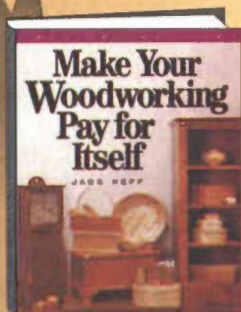
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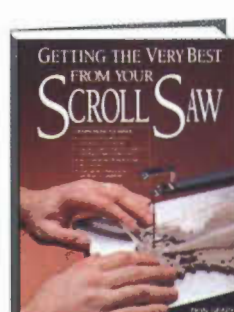
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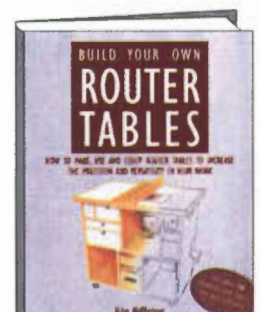
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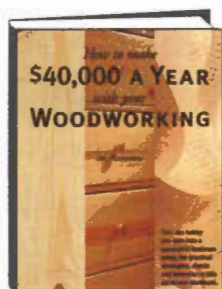
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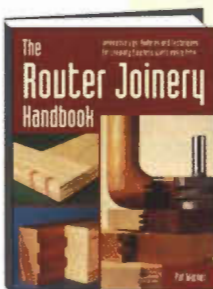
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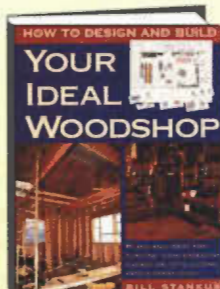
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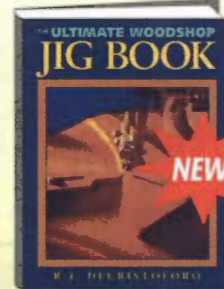
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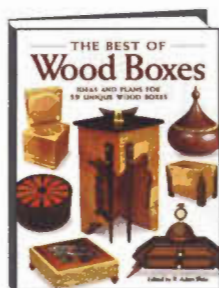
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The Wrong Way to Get a Breeze Going in Your Workshop

After many weeks of research, my son and I selected a lathe for our Christmas present. We got it home, set it up and decided we would make a wooden mallet for our first project. We glued up a block of hard maple about 12" x 12" x 20" and let it dry for 24 hours.

We set the very heavy block of maple on the lathe between the centers and checked it for balance by hand turning. My son asked if we should use an adze or something to take the edges off the rectangle before we started turning. "No," I said, "we will set the belts for the slowest speed until the block is fairly round and then change them to the fastest speed."

He had a different opinion than I did of what belt setting constituted the slowest speed so we called an engineer neighbor for help. He set the belts to about 400 rpm and had to leave.

As I reached to turn the lathe on, I told my son to be sure to put his safety glasses on, and as an afterthought we decided to stand back a little in case the block wiggled loose and fell off the lathe.

I hit the switch, and the lathe quickly ran up to 4,000 rpm. The maple flew off the lathe, breaking the $\frac{3}{4}$ " tool rest in half and creating an unsolicited window in the cinder block wall of our garage.

My son's only comment was, "The safety glasses wouldn't have helped, Dad."

Charles Kent
Carrollton, Texas

Kickbacks, Olympics-Style

Do you remember the days in high school woodshop when the instructor advised you about the possibility of "kickbacks" on the table saw. We all listened and thought, "Yeah, right." Well, if you continued woodworking as a hobby or career, you certainly experienced a kickback or two. Little 12" sticks flying just fast enough to make you glad you were standing to one side.

Well recently I experienced the "king of kickbacks." I had my 10" table saw set up in the driveway. While ripping $\frac{3}{4}$ " off a 1" x 6" x 8' board, I thought about the possibility of a kickback. I was standing to one side as I pushed the board, holding it against the fence. As I completed the cut, the board got caught by the blade and was sent hurtling. I watched in horror as the javelin-like board flew across the street and into the neighbor's driveway.

I stood in amazement and could not believe my luck. First, no cars were passing on the street. Second, the neighbor did not have his car parked in the driveway. And third, no one was in the path of this lethal weapon. As for me not being hit, there was no luck involved. I look back to my high school days and thank my shop teacher for being concerned about safety.

I measured the distance later and was astonished to discover the board traveled 105 feet. Please believe that kickbacks do occur, and that the size of the board makes no difference. All table saw rips can kickback, if the right set of circumstances occur.

John Accardo
Napa, California

You Never Know When Your Kids Are Actually Listening

While visiting my daughter in New England in her 200-year-old sea captain's home, I watched bemused as she washed and dried all the utensils she had just used to create a couple of handsome pies. She then walked from one cupboard to another, carefully putting them all away.

Then, without a pause, she opened the cupboards and drawers again to take out a new collection of equipment, including some things that she had just put away. I couldn't resist asking what was going on.

"I'm going to start dinner," she says.

"But why did you put away half the stuff you've just taken out again?" I ask.

"Because you taught me not to be lazy, Dad," she replies. When I looked at her befuddled, she says, "Down in your workshop when I was about 5, I watched you do the same thing with your tools, putting them away and sweeping up, then starting right in on another project."

"What's that got to do with being lazy?" I ask.

With a withering look she delivers the punch line. "You said you were too lazy to have to search for a tool amongst the clutter around the shop, so you put everything in its place before starting a new job. And you said that's a lesson in laziness I should never forget."

I couldn't think of any smart rejoinder, so I just asked for another beer. **PW**

R. Edward Balfour
San Angelo, Texas

FAREWELL TO TALES FROM THE WOOD

This issue's winner of our Tales From the Wood contest receives a \$150 gift certificate from Lee Valley Tools, the catalog company that features an impressive array of quality woodworking tools, supplies and accessories. The runners-up receive a Veritas Marking Gauge (shown at right) from Lee Valley Tools.

We're putting this contest on hold for now to make space in *Popular Woodworking* for more projects, techniques and tool reviews. Thanks to Lee Valley for its support and all the woodworkers who shared some pretty amazing tales with us.

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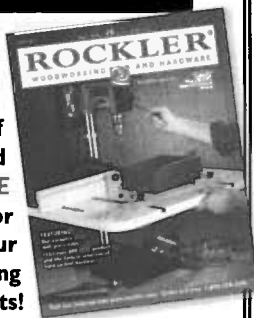


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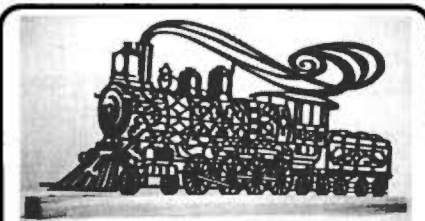
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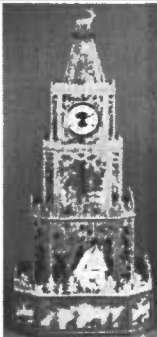


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CARTOON

Illustrated by
Bob Rech



John Kessinger, from Polo, Illinois, is the winner of our Cartoon Contest from the July issue and recipient of the Makita 20th anniversary cordless drill kit. The runners-up each receive a one-year subscription to *Popular Woodworking*:

"Lucky me! Newspaper says more rain tomorrow."

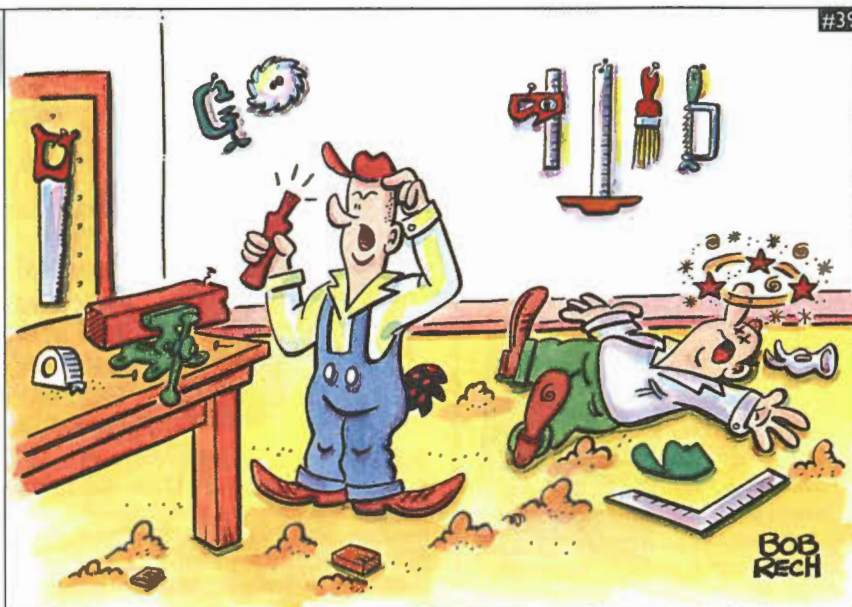
Roger Cate, Auburn, California

"This job's not near as 'rough' now that Spot is 'paper' trained."

Danny Hawks, Greensboro, North Carolina

"Sparky, because of the rain we'll do indoor exercises today. After running the belt sander you can bench press my pipe clamps."

Dan Gindling, San Diego, California



Submit your caption(s) for this issue's cartoon on a postcard to *Popular Woodworking*, Cartoon Caption #39, 1507 Dana Ave., Cincinnati, OH 45207 by October 22, 1999. Winners will be chosen by the editorial staff.

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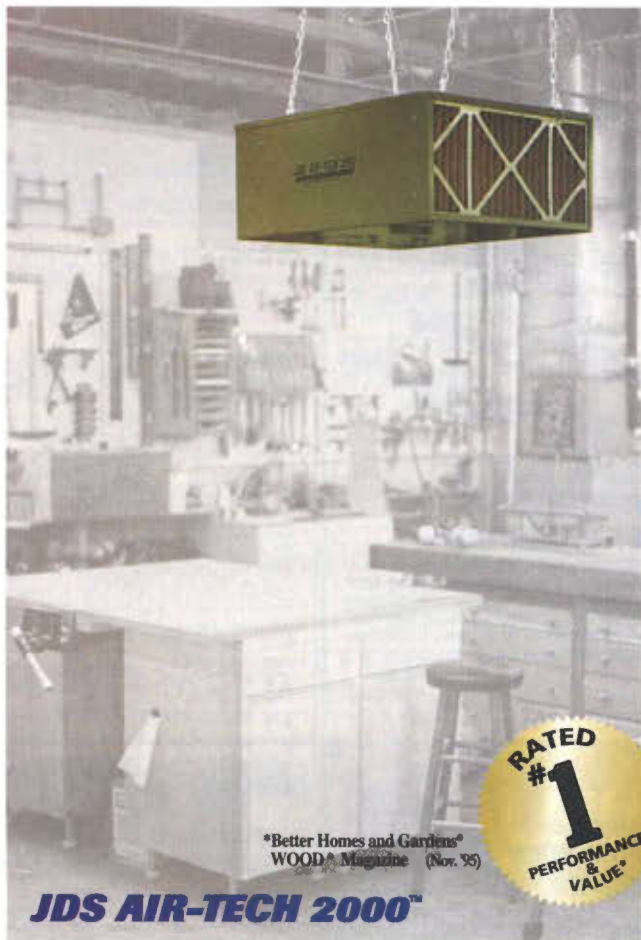
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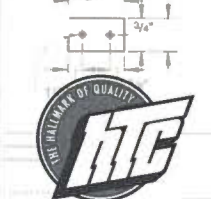
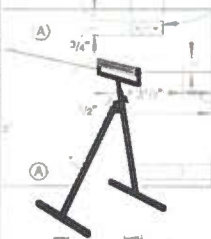
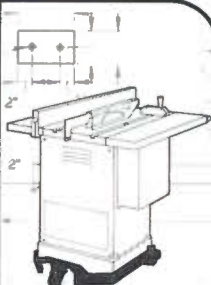
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- Tool weight: 2 lbs.

~~\$599~~ **\$3999**
ITEM 38308-2SPA

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Electric Power Tools

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- 300 SPM to 2400 SPM
- 1-1/4" stroke
- 600 watts
- Overall length: 17"
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- Tool weight: 7-1/4 lbs.

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ITEM 36595-6SPA

RECIPROCATING SAW BLADES

- 5 metal cutting 24 TPI, 5 wood cutting 7 TPI, 5 wood cutting 10 TPI
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PK. OF 15 \$399
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10", 2 HP, BENCH TABLE SAW

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- Blade capacity: 10" with 5/8" arbor
- Miter gauge adjusts 0° - 60° left and right
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- Shipping weight: 36 lbs.
- Blade and stand sold separately

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ITEM 38533-1SPA

10" 40 TOOTH CARBIDE TIP SAW BLADE

Resharpenable precision ground tips; 5/8" arbor
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~~\$649~~ **\$499**
ITEM 40432-1SPA

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1/2" SQUARE HOLES

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~~\$169~~ **\$149**
ITEM 35570-5SPA

CHICAGO Electric Power Tools

4" PLATE JOINER

- Fence adjusts to a maximum depth of up to 1-1/8"
- Maximum angle of up to 45°
- Preset depth stops: 0, 10, and 20
- Includes 4" carbide tipped blade, dust bag, high impact base and fence, carbon brush set, 4mm hex wrench, arbor wrench, glue bottle, assorted biscuits (10 each of 0, 10, and 20 gauge)
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~~\$599~~ **\$499**

ITEM 38437-2SPA

CARBIDE TIP PLATE JOINER REPLACEMENT BLADE

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- Blade diameter: 4"
- Maximum RPM: 12,000

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~~\$199~~ **\$179**
ITEM 40463-1SPA

10 GAUGE FRAMING NAILS

\$1999
ITEM 40535-0SPA

10 GAUGE GALVANIZED FRAMING NAILS

\$2499
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~~\$329~~ **\$299**
ITEM 36727-1SPA

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Resharpenable precision ground tips; Molybdenum carbide M2 tips; 5/8" arbor

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ITEM 38536-0SPA

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- High powered 10,000 RPM

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TOOL TEST

HOW WE RATE TOOLS

We test a lot of tools at *Popular Woodworking*, and while we don't often test tools until they fall apart, we do give them an honest, real-world workout. Each issue we share the results of our hands-on experience with you and offer insights to help guide your shopping decisions. The ratings reflect the opinion of the magazine's editorial staff.

Here's how our rating system works. **Performance:** A rating of "five" indicates we think this tool is a leader in its category — for now. (You won't likely see performance ratings of "one" or "two" in these reviews because we wouldn't publicize an inferior tool.) **Value:** "Five" is a great tool for the money; "one" isn't the mark of a value. However, a low "value" rating shouldn't prevent you from buying that tool. Some tools might be worth a little more because they're one-of-a-kind or just a really great tool.

If you have a question about a tool — whether it's been reviewed or not — you can contact me at (513) 531-2690, ext. 255, or by e-mail at DavidT@FWPubs.com.

And by the way, many of our past tool reviews appear on our website at www.popwood.com, including data on entire categories of tools (such as table saws). Check it out.

—David Thiel, senior editor

Two Tools In One From Craftsman

Craftsman has added an 18-gauge pneumatic nailer/stapler to its line of tools made with lightweight polymers. Able to accept 1/4" crown staples in 1/2", 3/4", 7/8" and 1 1/4" lengths, as well as 3/8", 1" and 1 1/4" brad nails, this is a fairly versatile tool. Changing from staples to brads is as simple as changing out the fasteners — no tools required. But you will need to change the pressure settings on your compressor. Brads fired well at 70psi, but at higher levels the broad plunger required for the staples left a rectangular indentation.

Reducing the psi solved that problem. On the other hand, firing staples worked well in softer woods, but when we tested the tool on ash and white oak (even at an un-recommended 110 psi) the tool couldn't sink the staple head below the surface of the wood. This is a problem we've seen in other combination pneumatic tools. The tool is oilless, with a directional exhaust port to provide stain-free work. Selling for \$99, we were generally pleased with the performance of this tool, except for the stapling limitations in harder woods. The tool is balanced, comfortable and lightweight, which makes it easy to use above your head or for extended periods of time. The 1 1/4" maximum length fastener is adequate for much woodworking, though 1 7/8" or 2" would be better, but obviously more problematic for depth of drive. Sold with a carrying case and fasteners, this is a great gift for the home woodworker.

For more information, circle #175 on the Resource Directory Coupon.



Performance: ●●●○○
Value: ●●●○○

Holiday Shopping Made Easy From Porter-Cable

About a year and a half ago, Porter-Cable made a lot of woodworkers happy by offering its venerable 690 router in a package that included both a fixed base and a plunge base for less than \$200. Last year's Christmas present has been upgraded, and what a deal!

Porter-Cable is offering the 10-amp, 1 1/2hp 690 router with a fixed base, plunge base and D-handle base, plus they're throwing in the 698 router table — all for about \$300! You can't get a much better deal or a more versatile router system. The 690 motor offers both 1/4" and 1/2" collets, uses 100-percent sealed ball bearings and for years has provided outstanding performance for home and commercial woodworkers. The three bases offer a versatility usually only provided by three separate routers. The fixed base can stay in the router table, the D-handle can be used for hand routing and the plunge base for plunge cuts. The 698 router table offers a separate on/off switch, a hole capable of accepting 3 1/2" diameter bits, a split-fence design and attachments for dust collection. This is a great deal. If you bought the two-base kit last year, sell it to a friend and buy this one.

For more information, circle #176 on the Resource Directory Coupon.



Performance: ●●●●●
Value: ●●●●●



Always Welcome on the Christmas List— Ryobi Cordless Kits

Ryobi continues to offer affordable, reliable cordless drill/drivers that have all the features of the more expensive models. Now Ryobi is bundling two of its models that will be great under the tree. Both a 9.6- and 12-volt center-handle drill/driver are offered in an oversized canvas carrying bag. The drills offer $\frac{3}{8}$ " keyless chucks, 24 clutch positions, two batteries and three-hour chargers. The 12-volt kit (RY1201K2B pictured) will sell

Performance: ●●●●○
Value: ●●●●●

for about \$89, and the 9.6-volt kit (RY961K2B) will be ready to wrap for only \$79. The kit bags hold a

couple of extra tools and work well as job-specific traveling tool boxes to the backyard or jobsite, or in the trunk of your car for emergencies.

For more info., circle #177 (9.6v) or #178 (12v) on the Resource Directory Coupon.

Japanese Planes that Deserve a Home in Your Tool Box

Of all the traditional Japanese wood-working tools available in the United States, the Japanese plane is perhaps the most foreign to Western hands. Instead of pushing the plane away from you, you pull the plane toward you to make your cut.

Despite the fact that Japanese craftsmen say you get more control of your cut this way, we've always been reluctant to try these planes because they were very expensive. However, Woodcraft (800-225-1153) has just introduced three new Japanese planes from Kakuri that are inexpensive (less than \$35) and work quite well.

When using Japanese planes there are three things to get used to. First, as mentioned earlier, pulling the plane toward you. Second, adjusting the cutting depth of the blade by tapping on the front and back of the plane body — much like using a Western wooden-bodied plane. Third, the throat is not adjustable. Once you get used to these differences, though, the planes are quite useful. The block plane works well on hard and soft woods. Our only complaint was the blade was a bit narrow ($1\frac{3}{16}$ "). The radius plane cuts either a $\frac{1}{4}$ " or $\frac{1}{8}$ " radius on edges. Once it's set up correctly, you might start reaching for this tool instead of your router for small jobs. The chamfer plane lets you cut 30-, 45- and 60-degree bevels on edges. You change the angle by moving the adjustable wooden fence. The chamfer plane is perhaps the best bargain at \$35 because if you remove the wooden fence, it works like a block plane. The blades in all three planes are sharpened and ready to use out of the box. Replacement blades are available. **PW**

For more information, circle #179 on the Resource Directory Coupon.



Performance: ●●●●○
Value: ●●●●○

TOOL SCOOP RYOBI UPGRADES ITS PORTABLE PLANER

For those woodworkers who discovered the joys of planing their own wood on an AP10 from Ryobi (the first affordable home shop alternative), Ryobi is ready to introduce the AP124 in early 2000. Not ready for testing yet, the tool offers a four-column design with a single-bar cutterhead lock. The machine has two disposable, double-sided knives for quick blade changes, and the knives are laterally adjustable to extend their life and avoid nicks. The 15-amp tool offers 16,000 cuts per minute with a $1\frac{5}{16}$ "-width cut. Price? About \$380. We will have a full review of the tool in an upcoming issue.

CORDLESS MITER SAW? MAKITA SAYS — YES!

Available in early October, Makita will offer an 18-volt sliding compound miter saw (model LS071 IDWBKE). Operating off a single Nickel Metal Hydride battery (two included). The $7\frac{1}{2}$ ", 40-tooth carbide blade moves on a dual-pole sliding mechanism to offer bevel cuts up to 45 degrees to the left, and miter cuts 47 degrees to the left and 57 degrees to the right. With cutting capacities of $5\frac{7}{8}$ " with the base set at zero degrees, and $3\frac{13}{16}$ " with the base at 45 degrees, maximum cut height is $2\frac{3}{8}$ ". Run time is reported at about 90 pieces of 6" crown moulding. Selling for about \$550, the saw features an electronic brake, externally accessible brushes, dust bag and carrying case with space for an 18-volt cordless drill.

DEWALT OFFERS NEW CONTRACTOR'S SAW

Available by the end of the year, DeWalt's newest table saw (DW746) sports a number of features that should please home woodworkers. The saw is a contractor style, but the $1\frac{3}{4}$ hp induction motor is mounted in-board and is spring-loaded in addition to using the motor's weight for belt tensioning. This reduces vibration and moves the motor out of the way of the rear of the saw. The motor is also mounted to allow the blade to tilt to the left, making it a safer tool. Priced between \$900 and \$1,000, the saw offers a standard integrated blade shroud to channel sawdust to a dust collection port, an oversized switch for knee-capable shutoff, a lowered blade-elevation crank for better hand clearance and a precision fence system. As an accessory, DeWalt will offer a sliding table (\$400) that delivers 30" cross-cutting capacity. The sliding table is designed to store folded so it doesn't interfere with other saw operations. Check here next issue for a full report of this saw's capabilities. **PW**

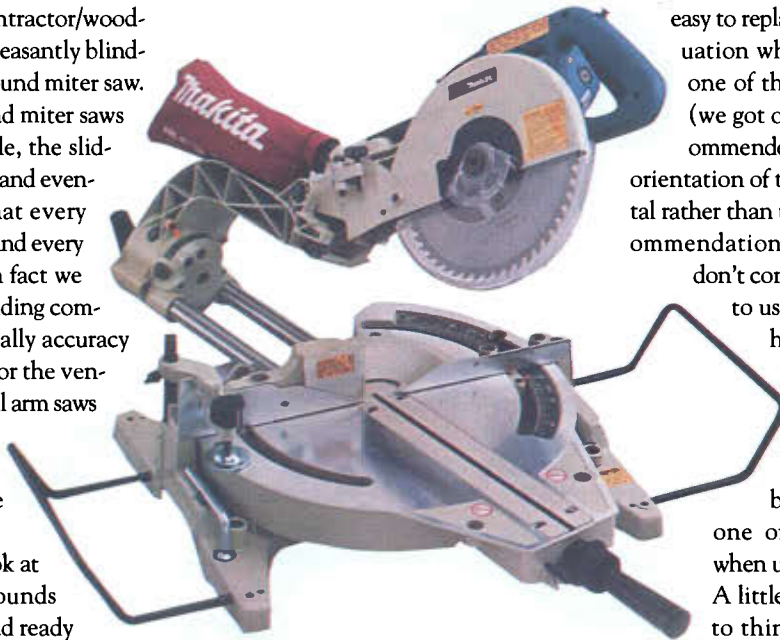
Makita LS1013 Sliding Compound Miter Saw

A few years ago the contractor/woodworker market was pleasantly blindsided by the sliding compound miter saw. While miter and compound miter saws had been around for awhile, the sliding model appeared quietly and eventually became the tool that every manufacturer had to offer, and every tool owner had to own. In fact we think the benefits of the sliding compound miter saw — especially accuracy — make it a replacement for the venerable radial arm saw. Radial arm saws can cut wider boards, however, and they also can rip lumber, a feature we're not keen on.

We had a chance to look at all of the sliding compounds (with four or five set up and ready to use in our shop at any one time) — poor us. Once we got through the testing, we had to choose a keeper. After some cussin' and discussing the Makita LS1013 was tapped as the tool to remain in the shop. That was two years ago, and the 1013 still holds its position of prominence.

The LS1013 was a stand-out when we first tested it. The dual-rail design and single-piece table offer smooth operation, and with the slide release and table adjustment controls at the front of the machine (where they belong), this tool is a pleasure to use.

The clear guard offers an unobstructed view of the cut and moves out of the way easily during use. The saw's ability to bevel cut from zero to 45 degrees to both the left and right is more capacity than offered by most competitors. Speaking of competitors, many of the sliding compound saws tip over when the slide mechanism is



pushed all the way to the rear. Makita solved this problem by mounting the slide bearing mechanism under the table, moving the center of gravity forward, which created a more stable saw.

The milled aluminum fence is big enough to support most work and has a flip-up auxiliary fence that quickly clears the path of a compound cut. When lowered, it returns the fence to a solid, flat plane. If the fence height is not adequate for your task, the fence is pre-drilled to accept an auxiliary fence. An added benefit is the saw's hold-down clamp — it's one of the best we've tested.

RECOMMENDATION: We continue to enjoy the LS1013. An inexperienced user (we won't name names) managed to trim off part of the aluminum auxiliary fence during a compound cut, but it was

easy to replace. During an earlier evaluation when we chose this tool as one of the best new tools of 1998 (we got ours in late 1997), we recommended that Makita change the orientation of the handle to the horizontal rather than the vertical axis. That recommendation still stands, though we don't consider the handle awkward to use. One problem did arise, however, when we had to square the fence to the blade. We've only had to do this a couple of times in the last two years, but when we did, we found one of the bolts inaccessible when using the on-board wrench. A little picky maybe, but we had to think of something to complain about.

All in all, we're still very comfortable in recommending the LS1013 as an excellent tool that rates at the top of its category. **PW**

RESULTS

MAKITA LS1013 (\$500 - \$550)

NICE FEATURES

- Best performance and smoothness of operation over any competitor
- Very accessible controls
- Reliable accuracy and repeatability
- No tipping problems

RECOMMENDED MODIFICATIONS

- Horizontal handle
- Easier fence adjustment

For more information about the LS1013 or other Makita tools, call 800-462-5482, or visit their website at www.ukindustry.co.uk/makita/

ABOUT OUR ENDURANCE TESTS

When a new tool hits the market we do our best to tell you that tool's benefits and pitfalls. While this is good information, we know that the question you really want answered is, "How long will the tool last?" That's what this column is all about. Each issue we pick a tool we've used in our shop for at least a year and has stood up to our regular use. We make sure the tools we've tested are virtually unchanged from the versions in the store today. So when you see a tool written up here, it has passed the *Popular Woodworking* Endurance Test. —David Thiel, senior editor

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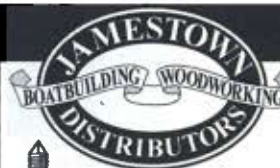


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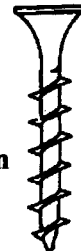
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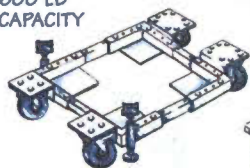
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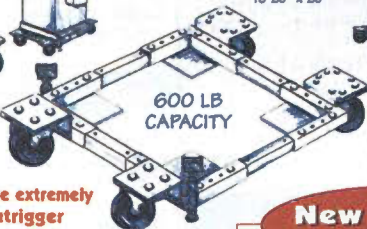
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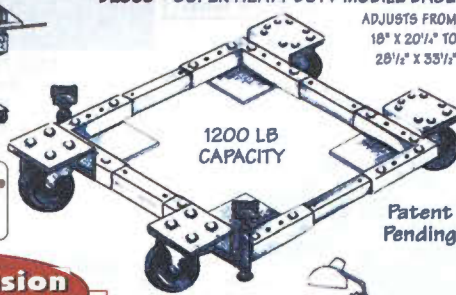
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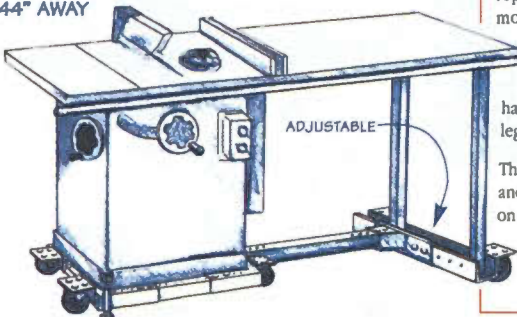


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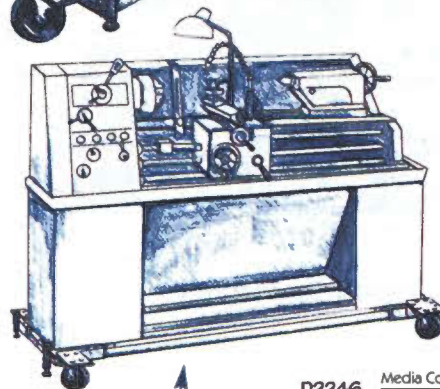
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Burchwood

You might think it an honor to have a type of wood named after you. For me, it was a mark of shame.

Well, my credibility is shot. You can spend months and years learning the feel of wood. The texture. The weights. The densities. The end grain. You learn to look through stains and finishes and age to determine what wood you are looking at. You analyze the grain patterns, the rings, the size and distribution of the pores. Even the smell. You build a reputation as “one who knows what he’s talking about.”

Then, in one crashing, humiliating minute, you blow it. All this time, you’d been the so-called-expert. You were the one who was looked upon as the guy who knew. The learned one. People talked about your identification skills even when you weren’t around. “OI’ Todd, yeah, he knows his woods. Ask Todd, he’ll know.”

A friend I work with, Chuck, has a wife who works as a teacher. School just got out, and she was bombarded with gifts from students. One of those gifts, a round, wooden box, made it to my desk. Chuck knows I like wood and could find a use for the nice little painted box. It was about 6" in diameter with a height of about 2", and had an overlapping loose-fitting lid to boot.

Another guy I work with had asked me some time back to make a box for him so he could keep headphones he uses at his health club safe. Being the clever guy I am, I walk down to Jay’s office to give him his new wooden headphone box.

Jay takes it and looks at it closely. I was telling Jay about the box when another co-worker, Jeff, walks in the room to join the conversation. Jay asks, “What kind of wood is this, Todd?” I wasn’t sure, because it was covered in paint, and the box smelled of chocolate, as if there had been some melting of its contents prior to its presentation to me, so my sense of smell was worthless in determining the type of wood.

Because the box was painted, I couldn’t see the grain or color, and it was thick



paint, so I couldn’t see any pores. I also couldn’t see any tacks or overlapping wood that is common for a round or oval box. What type of wood was it? “Well Jay, I’m not sure, but it’s wood.” I take the box and beat the corner of the lid against the bottom of the box. “See, listen, it’s wood.”

Jeff wants to look at it. He takes the box, gets out his pocketknife and removes a little paint. “This is not wood, it’s CARDBOARD!” he exclaims. The sweat starts. “No it’s not,” I retort. “Let me see it.”

Well, the damage had been done. No taking it back. I was busted. While it turned out to not actually be cardboard, it was a composite material, but that didn’t matter. It wasn’t wood. I try a quick and desperate attempt to swing my result from wood to wood-product, but I was not heard through all the laughter.

So the comments start flying. “Hey, it’s Burchwood! Did you know that we’ve got some Burchwood boxes over there in the trash, too.” Then, doubt in my skills spread like wildfire. “Hey, if Todd thinks this is wood, what about all those other times we asked him about wood?”

Zero credibility. Total humiliation. Go back to the bottom. Do not pass go. Do not collect \$200.

Well, it will take me a long time to crawl out of this one, at least with the guys I work with. But we all got a good laugh at my expense. But that’s OK. They’ll still come to me when they want something made. But not out of Burchwood. **PW**

Todd Burch, a woodworker in Houston, is president of the Woodworker’s Club of Houston. He makes boxes of all sorts, harvests his lumber and uses and collects antique tools.



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