

11
PROJECTS
INSIDE!

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July 1999 #109

Popular Woodworking

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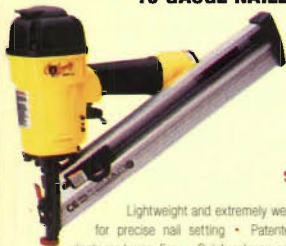
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34

FEATURES & PROJECTS

Burlington Farmers' Desk

26

It looks like an oversized end table. But instead of a drawer, the top of this project swings open to reveal a well-organized writing area with three drawers and cubbyholes.



26

Titanic Deck Chair

30

Only two of the super-comfortable folding deck chairs survived the sinking of this famous oceanliner. You can buy a replica for \$1,000. Or build your own for a fraction of the cost. You'll have a terrific chair and a great story to go with it.

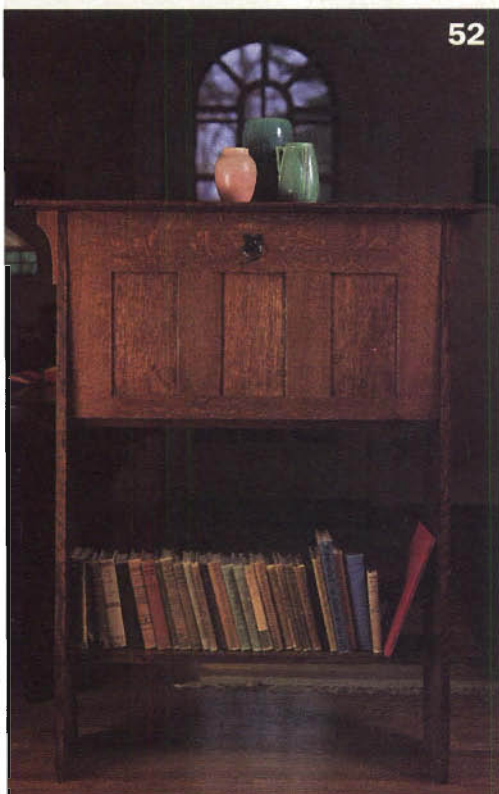


30

Greene & Greene Garden Table

34

The Arts & Crafts furniture built by the Greene brothers combined American forms with Asian style. This coffee table is a perfect companion to our Greene & Greene Garden Bench from the May 1997 issue (#96).



52



45

Bauhaus Jewelry Box

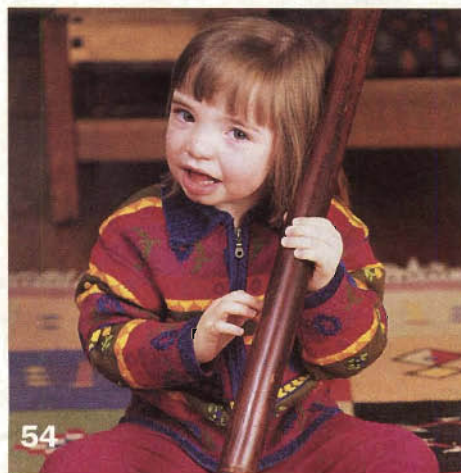
45

The clean, modern architecture of Mies van der Rohe and le Corbusier is suggested in this ingenious and spacious jewelry box. To build it, you don't need a lot of wood, just a steady hand and the ability to work to tight tolerances.

Arts & Crafts Cellarette

52

Liquor cabinets were a hot item at the turn of the century (before Prohibition, that is). If alcohol isn't your thing, this Arts & Crafts version doubles as a handsome fall-front desk.



54

Here Comes the Rain **54**

When your next luau is over, soothe your senses by building a rainstick using a Tiki torch, shish kebab skewers and dry goods from your kitchen. A great project for kids and beginning woodworkers.

Woven Clock **56**

When your neighbors see this clock, they're going to think you've found a place to buy spaghetti wood. You don't have to tell them your secret is a scroll saw.

Garden Windmill **58**

Turn your back yard into a little piece of the Dutch countryside. Building this garden windmill will teach you how to cut compound miters on your table saw and how to glue up irregular-shaped objects with band clamps.

Chair-Side Reading Table **66**

Americans never have enough room for all their magazines. This end table does its part by holding all the things you need to read: a lamp, books and a big stack of mags.

Endurance Test **75**

Find out how Ryobi's specially designed woodworking drill press fared in *Popular Woodworking's* shop after two years of hard use.

COLUMNS

Out On a Limb **6**

Why you're paying too much for lumber

Letters **8**

Mail from readers

Tool Test **12**

Cris Cuts **14**

Band Saw Master Jig

Tales From the Wood **22**

Flexner on Finishing **24**

Protecting Exterior Wood

Projects From the Past **50**

Glider Bench

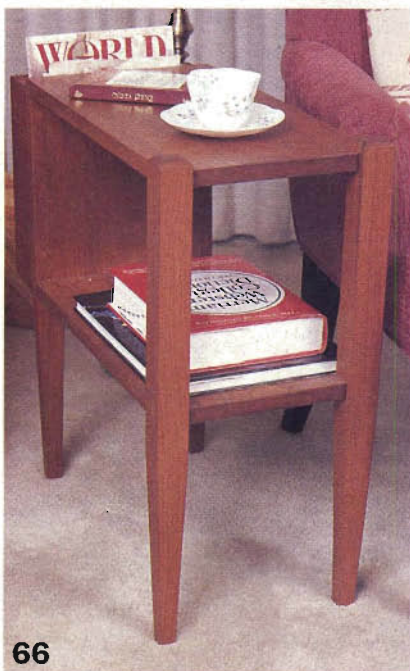
Caption the Cartoon **74**

Tricks of the Trade **76**

Classifieds **78**

Out of the Woodwork **80**

Wooden Wonderland



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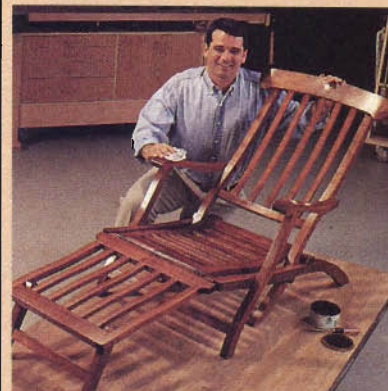


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On the Cover



Cover photo: Al Parrish, Parrish Photography

Built from a combination of historical references and modern variations, our version of the *Titanic's* deck chair offers the comfort and elegance of an age lost in time and in this case, historical disaster. These chairs started the ill-fated voyage as loungers on the first class decks, and many of them served as makeshift life-rafts for a short while before heading to the bottom of the Atlantic with the ship itself. While we've included a nod to the carved White Star Line logo (owners of the *Titanic*) on the crest rail. You can personalize your chairs with your family initials or crest.

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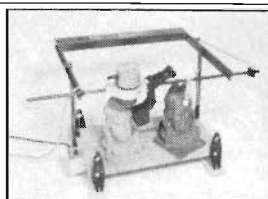
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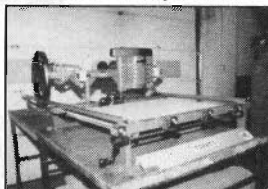
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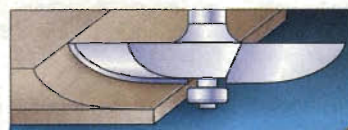
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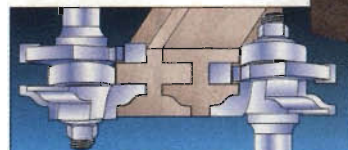
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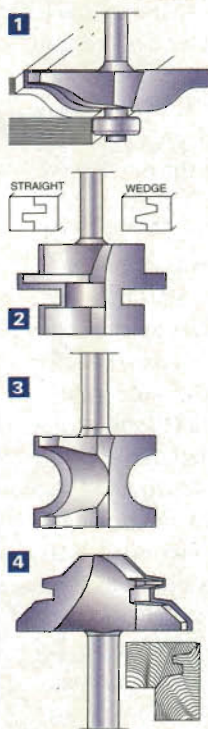


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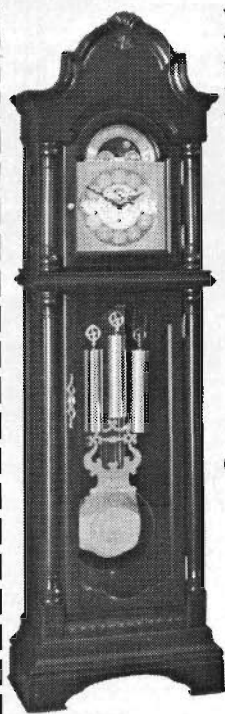


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6 Popular Woodworking

OUT ON A LIMB

Why you're paying TOO MUCH FOR LUMBER



When I left the woodworking business five years ago and entered the parallel universe of hobby woodworking I was shocked at the prices Mr. Garage Woodworker was paying for materials. Of course, during the 15 years I'd spent in the trade, the price of wood and hardware had gone up. But all of a sudden it was as if these same products had been caught in a Third-World inflationary spiral. You know, bread today 20 cents, bread tomorrow \$6.

The price of a board foot of black cherry went from \$3 and some change to \$4.50 or \$5. Same with maple. Poplar jumped from \$1.25 to \$2. A sheet of cabinet-grade plywood leaped from \$37 to \$48. A hinge that was less than a dollar was now almost \$2. A gallon of glue that was \$18 now cost \$25. Had I gone to bed one night and slept for years, awakening to a changed world?

Well, years hadn't passed, but the world had sure changed. I had landed in the world of retail pricing.

Lumberyards have several price levels for the same wood, the variable being how much wood you buy in a year. Buy a gazillion board feet, and you get the best price. Heck, they even deliver it free. Same thing happens with specialty hardware suppliers that sell to commercial shops. But for the schmo who walks in with a friendly smile and cash money, most lumber yards have an extra special price category just for him — retail. For the privilege of buying "cash and carry," Mr. Garage Woodworker gets to pay an extra 30 to 50 percent.

Now to be fair, I understand that the cost of sale for a \$50 order is the same as a \$500 order, but is the mark-up justified? In some cases, the lumber yard has a showroom, and the wood is planed and has a straight edge, which adds to the cost. But does it add that much? Do the retail woodworking supply stores have that much extra overhead than the

commercial shop jobber? I know of a supply catalog that has a wholesale/retail pricing structure. I accidentally got on their wholesale list last year. You'd be amazed at the difference in prices.

So what can you do? Short of having a brother-in-law in the business, you're going to have to do your homework. Avoid buying hardwood lumber at home centers, the most expensive option around. If you have a planer and jointer, buy material in the rough. Look for small lumber outlets, such as owners of portable saw mills who saw, dry and sell lumber without the middleman. One of our editors here buys wood from a guy in Indiana (Carrier's 765-544-2275). Ash, maple and hickory are a buck a board foot. Walnut is \$2. Of course, the sawyer doesn't deliver to us, but the 100-mile trip is worth it. Also, look for large sawmills that sell to the public. One sawmill in Indiana (Frank Miller 765-964-7705) sells quartersawn white oak for about \$4.50 a board foot. We also stumble on people who are retiring or getting out of the woodworking business. As a result, we've bought some beautiful wood at prices too low to mention here. So check your local paper. For a break on hardware, look for a commercial hardware supplier in your area and go see the sales manager about purchasing from him.

Personally, I see the cost of materials as the biggest obstacle to people discovering the joy of working wood. When it's a matter of how you buy it, rather than what it really costs, it's an obstacle that need not be there. I'm reminded of a line from a Woody Allen film when he explained that the only cardinal sin in his family was paying retail. So Mr. Woodworker, get shopping! **PW**

Steve Shanesy
Editor & publisher

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Circle #120 on Resource Directory Coupon



LETTERS

We welcome your comments about *PW* or anything related to woodworking. We'd also like to see color pictures of what you're building. Send your input to: Letters, *Popular Woodworking*, 1507 Dana Ave., Cincinnati, OH 45207. Our e-mail address is: PopWood@FWPubs.com. Letters may be edited for publication.

—Steve Shanesy, editor, *PW*

Is the Porringer Table as Delicate as it Looks?

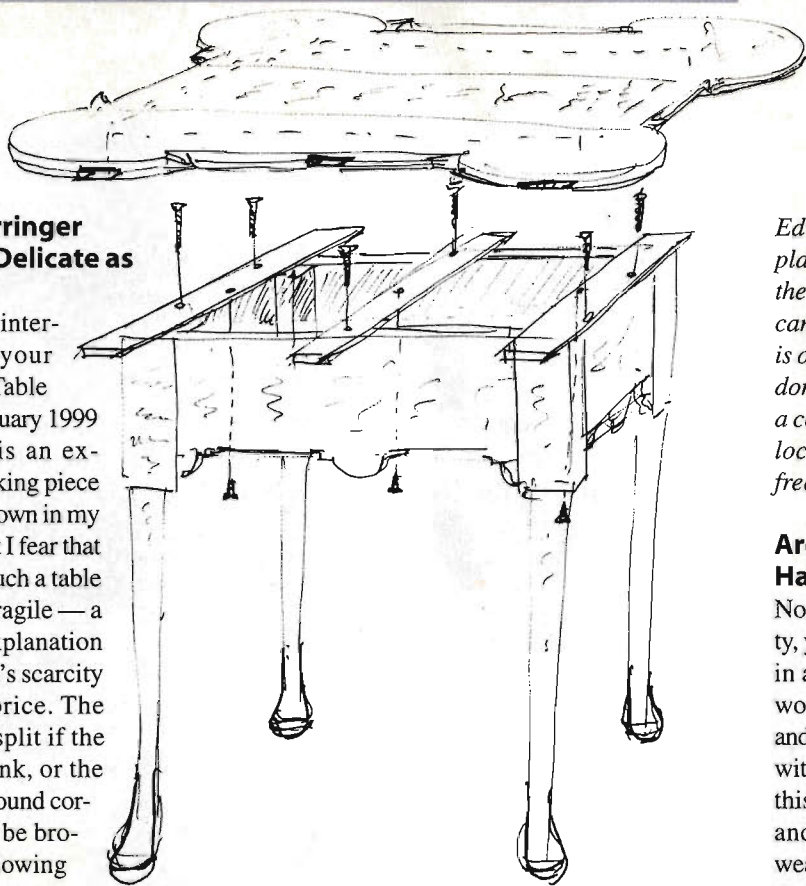
I was very interested in your Porringer Table project (January 1999 #106). It is an exquisite-looking piece that is unknown in my country. Yet I fear that the top of such a table would be fragile — a possible explanation of the table's scarcity and high price. The top could split if the wood shrank, or the oversized round corners could be broken off following the grain.

In your opinion, could I modify the top to deal with these problems without altering the "spirit" of this simple and beautiful American piece? Perhaps the top could be reinforced with three slats that rested in three sliding dovetails that run across the width of the top. The slats would be attached to the base with screws.

Vincent Lavarenne
Brunoy, France

Vincent, this piece is an acquired taste for people who aren't familiar with the genre. It's considered folk furniture, and there just wasn't much of it that was made very well. That (more than anything) contributes to a porringer's rarity. Don't worry about the durability of the piece. When I worked for a reproduction furniture maker, we made hundreds of these tables. We used highly figured wood, which isn't the most stable. I never saw one of these tables come back due to excess wood movement or the fragility of the porringer corner. As a matter of fact, I had to repair only one. It fell off the back of a truck going 35 mph. The only damage was to one of the feet. Make this table in the simple traditional way, and you will get a lifetime of use from it.

—Jim Stuard, associate editor



Please Publish an Index for the Magazine

I really enjoy your publication. I also enjoy other woodworking magazines, one of which publishes an index of past projects and articles.

It would be of great help in locating a project in a back issue of *Popular Woodworking* if you would consider printing an index periodically. This way I could spend more time working on projects instead of looking for them in my files.

Larry Balducci
New Lenox, Illinois

Editor's note: We're working on it. We plan to publish a full index sometime in the next few issues. For those of you who cannot wait, our entire index of articles is online at www.popwood.com. If you don't have a computer (or a friend with a computer), you might want to try your local library, many of which now offer free internet access for patrons.

Are Shop Aprons Hazardous to Your Health?

Norm Abram talks a lot about shop safety, yet he wears the most hazardous thing in a workshop: a leather apron. I have worked in machine shops for 55 years, and we were not allowed to wear a smock with pockets. The only people who wear this garment are construction workers, and I have never seen a cabinetmaker wear one. In my opinion, there is no need to wear one of these in a shop if everything is close at hand.

Fred J. Johnson
Oil Springs, Ontario

Editor's note: I don't consider a shop apron inherently dangerous as long as it's not loose-fitting or has tie strings dangling. I wore one for years while managing a larger woodworking shop, as did other cabinetmakers. The pockets are great for tapes (or folding rules), pencils and other measuring devices. While it's true the home shop is smaller with tools closer at hand, I always find my pencil or tape is always on the other side of the room when I want it.

—Steve Shanesy, editor & publisher

How Can a 6.3 hp Shop Vac Work on a 15-amp Circuit?

Just a note to tell you how much I appreciated "What You Absolutely Must Know About Motors" (March 1999 #107). Unfortunately, I read it after I had bought a new miter saw, thinking my old one was getting too noisy. My new saw turned out to be as noisy as the old one. After I read your article, I learned that all universal motors are noisy. I have a suggestion: In future rankings of power tools, particularly those with universal motors, give a ranking of the noise level of each machine. I hate wearing earmuffs.

I also have a question. I recently bought a new shop vac, which has a label saying it produces 6.3 peak horsepower. I don't see how this is possible as by my calculation the maximum horsepower produced by a 110-volt circuit with a 15-amp breaker is just over 2 horsepower. How is this possible?

Tom Mueller
Orinda, California

Editor's note: We'll look into gauging the noise level on power tools, though most universal motors on woodworking power tools are loud enough to require ear protection (routers especially).

As to your shop vacuum dilemma, it's fair to say that "peak" horsepower in a shop vacuum is a lot like "developed" horsepower in a woodworking machine. It's the absolute maximum power the motor achieves in a laboratory — right before it self-destructs or stalls. We talked to the manufacturer of a high-quality line of shop vacuums, and the engineers there say they test their motors on a dynamometer, in a laboratory, unattached to the rest of the vacuum apparatus. The result is a horsepower rating that the motor could never achieve in your basement on a 15-amp circuit.

Why do they do this? Chalk it up to a marketplace where shoppers want power — and lots of it.

—Chris Schwarz, managing editor

So Much for Tool Reviews, Indeed

I find tool reviews interesting. I do nice work, and when people look at it they often say I must have a nicely equipped shop. That always brings to mind an incident from the mid-1970s when I was working maintenance for a winery in Northern California.

The maintenance department was divided into two sections: those in the winery proper and those in the field. The winery section took care of the pumps, tanks, refrigeration, plumbing, heating and other things related to the production of wine. The field personnel were concerned with the equipment to grow grapes. I worked in the winery, and one day my duties took me to the field section where I was introduced to two chaps that had been working for the winery for about two weeks.

They had just arrived from Portugal and had considerable difficulty with

Continued on page 10

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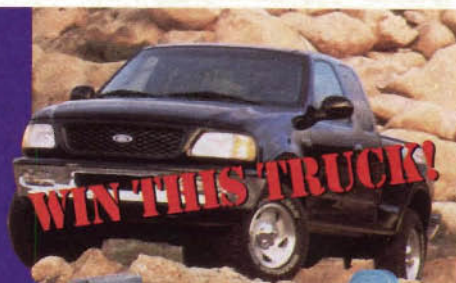
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LETTERS

Continued from page 9

English. But they proudly showed me a beat-up rusty jack plane and what I believe was a very rusty 10-point hand saw with about half the teeth missing. Then they showed me a bunch of 2 x 8s they had pulled from the burn pile. I asked what they proposed to do with these things, and they said they were going to make a work bench needed for their area. To myself I said, "You bet."

Several weeks passed, and I had to return to the field section. The chaps proudly showed me the work bench, and it was the most gorgeous bench I have ever seen. I examined it closely. The joints were perfect, the 2-bys smooth and nicely finished. And to top it off, the sparkling jack plane and the shiny saw with all its teeth were on the shelf and peg respectively.

So much for tool reviews.

Ralph Woodward
Olympia, Washington

More Ways to Stop Your Poly Glue From Curing

In the letters column in issue #107 (March 1999), Ordean Grant passed along a tip to store polyurethane glue in the freezer. You also suggested storing it upside down so the glue cures in the bottom of the bottle.

Actually, both solutions are necessary. The moisture in the air cures a layer of glue on top of the bottle. So why put it in the freezer? Have you noticed that the glue cures on both the top (or bottom) of the bottle and from the sides in? This is because moisture in the air migrates through the bottle. This could be solved by putting the glue in a glass jar (messy!) or by storing the glue in a low-moisture environment: a frost-free freezer. Another suggestion that seems to work is to displace the air in the bottle by pouring a small amount of mineral spirits in the bottle or by shooting some dry gas, such as "Bloxygen" into the container. **PW**

Andrew Beals

San Jose, California

You can read our original article about polyurethane glue that explains when and how to use it at:

www.popwood.com/features/fea5.html

Safety Note

SAFETY IS YOUR RESPONSIBILITY. Manufacturers place safety devices on their equipment for a reason. In many photos you see in *Popular Woodworking*, these have been removed to provide clarity. In some cases we'll use an awkward body position so you can better see what's being demonstrated. Don't copy us. Think about each procedure you're going to perform beforehand. Think ahead. **SAFETY FIRST!**

Clarifications

SCROLLSAW SILVERWARE BASKET • In the "Scrollsaw Silverware Basket" article from the March 1999 issue (#107), some readers have been wondering what thickness material the sides are and if the thickness is critical. The sides are cut from 1/2" material, and the woven basket won't work with other thicknesses.

TAVERN TABLE • We neglected to include the full-size diagram for the leg in the "Tavern Table" article (March 1999). You can download an image of the leg from our website at:
www.popwood.com/fixes/leg.html

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TOOL TEST

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 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 specific tool — whether it has been reviewed or not — 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. Check it out.

— David Thiel, senior editor

Delta International Adds Swanky Upgrades to its Jointers

If you're on the fence about which new jointer to buy, we suggest you take a good look at the fence on Delta's new jointers. Delta International (www.deltawoodworking.com) has upgraded some features on both their 6" and 8" jointers and turned out two very nice machines. Both offer an improved rack-and-pinion fence-adjustment system that moves very easily, an enclosed steel base with integral dust collection port, a new infeed table height-adjustment system that uses a lever with a trigger (which is quicker than loosening a knob and turning a hand wheel), and a power switch mounted above the table for easy and safe access. The 6" model 37-195 (selling for \$550) sports a 1hp motor and 46" table length with a 4⁷/₈" x 35¹/₄" fence. The 8" model 37-380 (selling for \$999 and available in early July) features a 1¹/₂hp motor, 76" table length and a 5" x 40¹/₂" fence.

Neither of these tools is the most affordable in its category (the 8" is a better deal than the 6"), but the new fence, height-adjustment lever and switch are worth the extra cash. Delta has taken a machine that many of us take for granted and made it more user friendly and safer. Good work, Delta. Thanks for paying attention to the basics.

For more info., circle #151 or 152 on the Resource Directory Coupon.

Porter-Cable's 2hp Micro-Adjustable Plunge Router

With the introduction of Porter-Cable's new model 7529 plunge router, the competition in the market for precision plunge routers just got stiffer.

The 2hp, 12-amp router has a micro-height adjustment so you can fine tune the depth of your cut within 1/128". To make sure you can see the difference that micro adjustment makes, the router offers an integrated dust collection system that pulls dust through an opening in the base. You can even fine-tune the router bit's depth while the router is in the "locked" position, which makes it well-suited for router table use. Another indication that the router is built for both free-hand or table-mounted use is that Porter-Cable (www.porter-cable.com) has put power switches on both the top of the router (for router table use) and on the handle. With variable speeds between 10,000 and 23,000 rpm, the router also includes a soft-start feature, an electric brake and a spindle lock for convenient one-wrench bit changing using either the 1/4" or 1/2" collet. Other pleasant surprises were how quiet the router's motor was and how little it vibrated.

The 7529 fills out Porter-Cable's extensive router line with a precision plunge that has cutting-edge features and will stand up to the rigors of hard use. The 7529 sells by itself for about \$210, or as a kit with an edge guide, an edge-routing dust cap and case for about \$245. So if you're in the market for a plunge router, make sure you check out the 7529 before you buy.

For more information, circle #150 on the Resource Directory Coupon.



Performance: ●●●●●
Value: ●●●○○

Performance: ●●●●●
Value: ●●●○○



Wrenchless Router Collet Now Available

We've been waiting anxiously to put Jacob's PowerCollet to work, and the revolutionary tool is now available for several popular routers as an aftermarket accessory. The PowerCollet lets you change 1/4"- and 1/2"-shank router bits without wrenches. The PowerCollet replaces the router's existing collet and nut, and this extends the length of the collet assembly. As a result, you need to add some metal extenders (included with the PowerCollet) that look a bit like stilts between the router's base plate and base.

After these modifications, we marveled at the ease of wrenchless bit changing. The base-plate extenders add a little to the overall height of the tool, but aren't problematic. We did notice a little extra vibration during operation on a Porter-Cable 690, but in testing the Power Collet on a DeWalt 625 noticed almost no change in vibration. This may be due to the shorter one-wrench collet on the DeWalt router, rather than

the Porter-Cable collet that needs two wrenches — neither of which we'll worry about again. All in all, the minor vibration didn't seem to affect the cut. And with the accessory retailing for \$50, the PowerCollet offers a vast improvement in convenience for router users.

For more information, circle #153 on the Resource Directory Coupon.

PowerCollet is now available for the following routers:

- Makita 3612
- Bosch 1615
- DeWalt 625
- Porter Cable 690 series
- Porter Cable 7500 series



Performance: ●●●●○
Value: ●●●○



Performance: ●●●●○
Value: ●●○●○

Finally, Japanese Plane Irons Made for Western Planes

Now you can buy laminated Japanese-style plane irons for Record and Stanley planes through Woodcraft (www.woodcraft.com • 800-225-1153). These blades, which cost between \$30 and \$37 each, are superior to the iron that came with your plane in two ways. They are thicker (resulting in less chatter), and the iron keeps a sharp edge much longer because of its laminated steel construction that bonds a layer of high-carbon cutting steel (Rc62-64) to a layer of softer, shock-absorbing steel. The irons take a nice edge and seemed comparable to the excellent replacement irons made by Hock, which cost about \$5 less. The laminated plane irons come honed from the factory and make a decent cut right out of the wrapper. However, like almost every other plane iron, these weren't ground square. After a little grinding and honing, though, we made some sweet shavings.

For more information, circle #155 on the Resource Directory Coupon. PW

TOOL SCOOP

Makita Celebrates 20 Cordless Years

To celebrate its 20-year anniversary as a cordless tool manufacturer, Makita is offering two of its top-of-the-line cordless drill kits at great prices. Both the 12-volt model 6213DWBLE and the 14.4-volt model 6233DWBLE Nickel-Metal Hydride tools are available in kits including two batteries, case, charger and flashlight. The 12-volt model, which usually sells without the flashlight for \$239, is only \$159. The 14.4 volt, usually selling for \$259, is \$179 with flashlight. One fine deal.

What Type of Table Saw is Ryobi's BT3000? And Should I Buy It?

In our 1999 Tool Report (March, '99, issue #107) we looked at a wide range of contractor-style table saws, providing specifications and suggestions on buying. Since then, several readers have asked why we didn't include the Ryobi BT3000 Wood Cutting System in our report. This wasn't a slight to the saw, but rather a decision based on its design. Traditionally, contractor saws are defined by their rear-mounted, belt-suspended induction motors. The BT3000 uses a universal motor mounted inside the saw's cabinet — which makes it a benchtop.

That said, the BT3000 is different than other benchtop saws on the market. Its features include a sliding crosscut table, a table board designed to work as a router table, a steel stand, a clever blade beveling feature and a rip fence that is better than those on most benchtop models. Optional accessories include table extensions, a vacuum table and a dust collection system. With the base model costing less than \$400, the BT3000 should be considered more as an inexpensive alternative to a contractor saw, rather than an expensive benchtop model.

To sum up, we're pretty comfortable recommending the BT3000 to woodworkers with a small shop and those who are on a budget. While the saw's universal motor will not last as long as the induction motor on a contractor saw, the BT3000 we've set up in our shop seems a versatile and useful tool.

Band Saw Master Jig

This versatile and inexpensive jig is guaranteed to spiff up your saw.

IF YOU USE THE BAND SAW merely for freehand sawing of curved components and an occasional resaw chore, you're selling short one of your shop's most versatile machines. Just adding an oversized table will improve your work. Add accessories to that table, and you can split cylinders or turnings, saw parallel curves, saw patterns, cut accurate circles and crosscut round stock. Tricked out, the band saw gains the status it deserves.

My Master Jig was designed for the average "small" machine. If your unit has a 12" to 14" cutting capacity from the blade to the post and your table measures about 12" to 14" square, you should be able to make it with a few alterations.

Before building this jig, check two things on your saw. With the trunnion at zero, make sure the angle between the saw blade and the table is 90 degrees. Also, verify the saw blade and the miter-gauge slot are parallel.

Start With the Table

Cut a piece of cabinet-grade plywood for the jig's table to size for your saw, then use the table saw to form the $\frac{1}{8}$ " kerf for the blade (see diagram). Next, form the T-slot for the pivot slide centered on the table. Cut the 1"-wide x 9"-slot using your table saw to define the width of the slot (stop short of the final length). Extend the cuts with a handsaw. Remove the waste with a chisel. Now widen the bottom half of the slot to 2" with a dado or by repeated passes with a saw blade. The cuts make $\frac{3}{8}$ " deep x

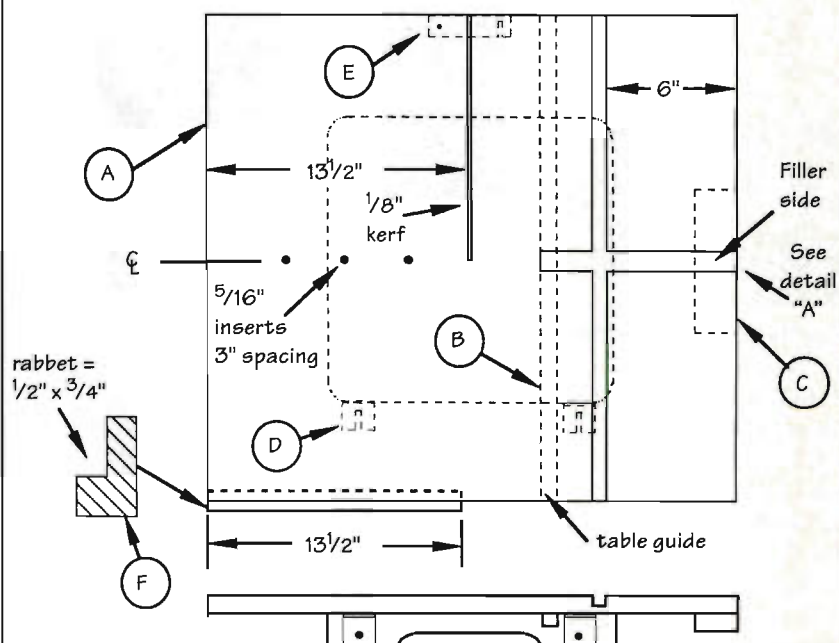
Continued on page 16

R.J. DeCristoforo is a contributing editor to Popular Woodworking.



The Table

Plan view of table





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Continued from page 14

$\frac{1}{2}$ " wide rabbets (detail A).

Next, use your table saw to cut the slot for the miter gauge. Locate it 6" away from the outside edge of the table. Its depth and width must match the bar of your miter gauge.

Drill holes for the three $\frac{5}{16}$ " threaded inserts as shown and install them through the bottom of the table until they are almost flush with the table's surface.

Table Guide

On the underside of the table, attach a table guide (B) that slides in the machine's miter slot. Here's how: put the table guide in the saw's miter slot, then position the jig's table so its right edge and the guide are parallel. Secure the guide by tacking through the table, then attach the guide permanently with four $\#4 \times \frac{3}{4}$ " fh screws from the bottom of the guide and glue. Drill shank and pilot holes for the screws so they won't split or spread the guide when installed.

Add the Braces

Prepare the part for the fence brace (F) and then cut the $\frac{1}{2}$ " $\times \frac{3}{4}$ " rabbet. Attach the brace to the table with glue and 4d finishing nails. Now cut the table brace (C) to size and install the $\frac{1}{4}$ " threaded insert as shown, then glue and clamp the brace in place until the glue sets.

Table Locks and Tie

Use aluminum angle with $1\frac{1}{4}$ " legs for the table locks. Because some pivot-guided work requires good alignment between blade teeth and pivot point, a slot in the top leg of the angle is needed. This allows the jig's table to be moved to allow for blade width and tracking adjustment.

Drill holes through the vertical leg of the locks to match the holes that are in the table for adding after-market accessories. Use bolts to secure the locks to the saw's table and put the jig's table in place. Use an awl to pierce the underside of the table at the front end of the slot in the lock and then install the $\frac{5}{8}$ " rh screws.

Make the table tie from aluminum strap. Attach it to the underside of the table so it spans the kerf. The tie keeps the table level on both sides of the kerf.

The Slides

Detail A

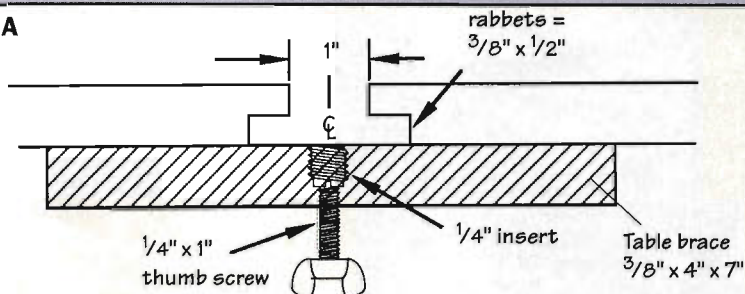


Table tie (PART E)

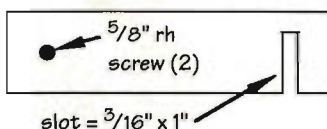
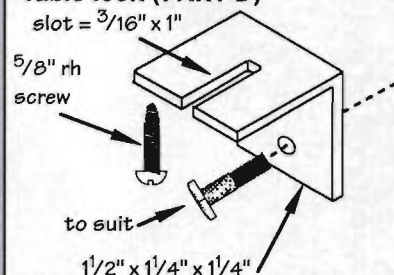
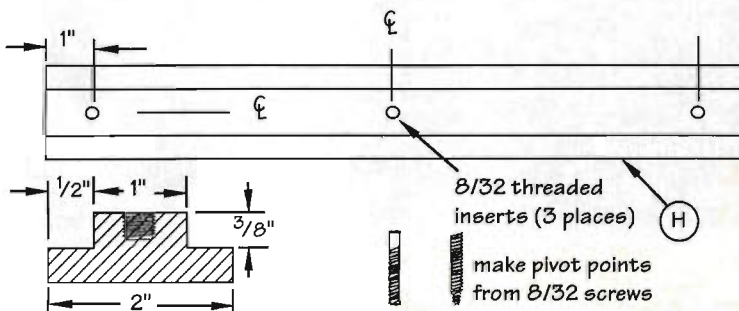


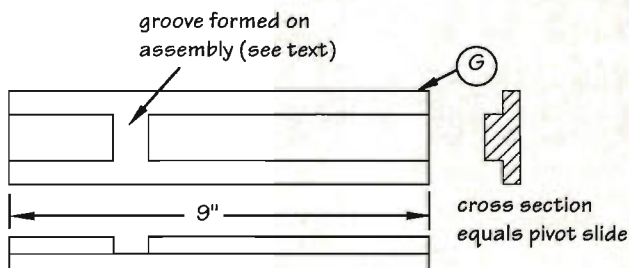
Table lock (PART D)



Pivot slide



Filler slide



The Pivot and Filler Slides

The filler slide (G) and pivot slide (H) have the same T-shaped cross-section and dimensions, so a good procedure is to start with parent stock that is 25" long and cut pieces to length after rabbeting the edges of the material. When the filler slide is in place, you'll see that it runs across the miter-gauge groove in the jig's table. So mark the location of the groove

on the slide and then notch it so it won't interfere when using a miter gauge.

Mark the locations of the three $\#8 \times 32$ tpi threaded inserts that are needed in the pivot slide. Install the inserts so they're flush with the top surface of the slide. Make the pivot points by removing the head from $\#8$ screws. Chuck one of them in a drill press and form a

Continued on page 18

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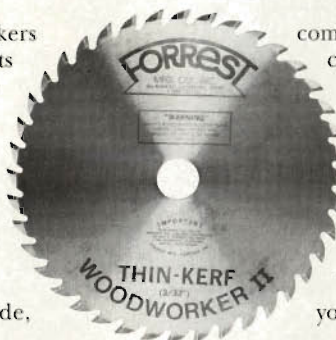
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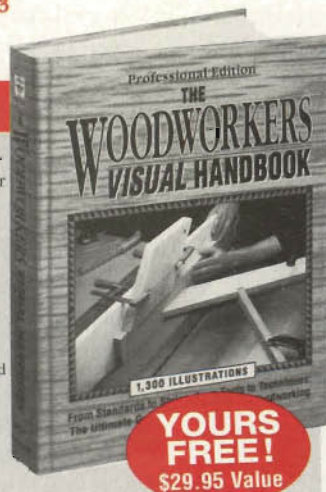
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Continued from page 16

point with a file, or grip the screw in a portable drill and spin it against a turning grinding wheel.

Making the Fence

Cut stock for the fence body (I) to overall size. Shape the top edge on the band saw and smooth it with a drum sander. Next, cut the ends (J) to size and install the rear one with glue and four #10 x 3" fh screws. Be sure to drill adequate shank and body holes and to countersink carefully before driving the screws. Before installing the front end-piece, carefully locate and drill the hole that is needed for the fence lock (K).

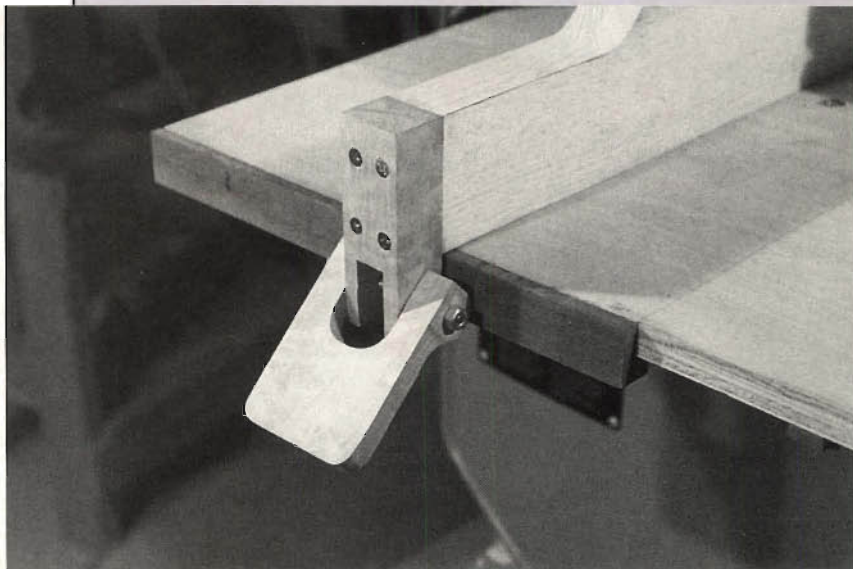
Now cut the fence lock to size, and accurately locate and drill the 1/4" hole. Lay out the shape of the centered opening and saw away the waste with a band saw. Then use the band saw to shape the lock's edge-profile but don't try to shape the rounded end exactly at this point. Instead, work by hand with sandpaper to "dress" the end so that, when the lock is pivoted downward, the rounded end will bear firmly against the fence brace to secure the fence's position.

Accessories

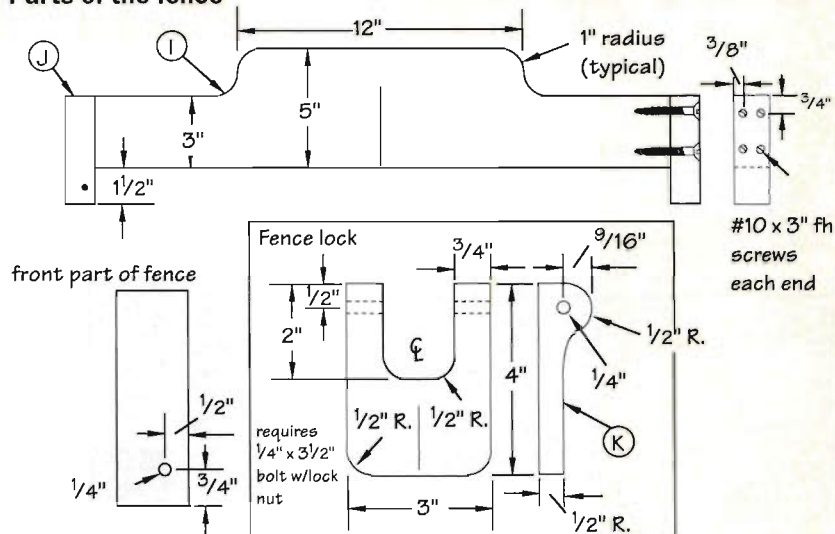
Cut material for the V-blocks to size (M & P). Form the V-shaped trough by making a 45-degree bevel cut along one edge of stock that is 24" long and then halve the piece. For the parallel V-block, use glue and brads to attach the two pieces to the base so they form a V-trough.

Continued on page 20

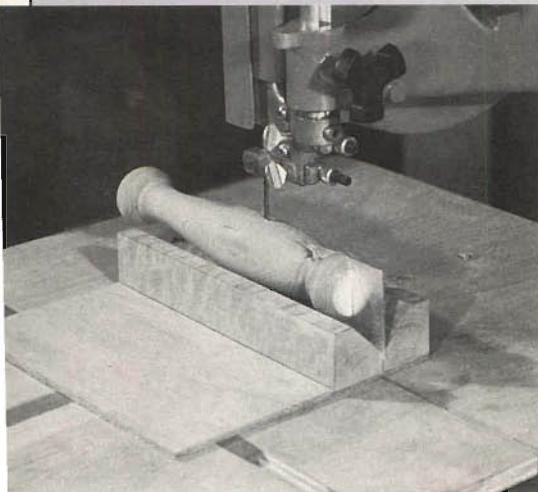
The Fence



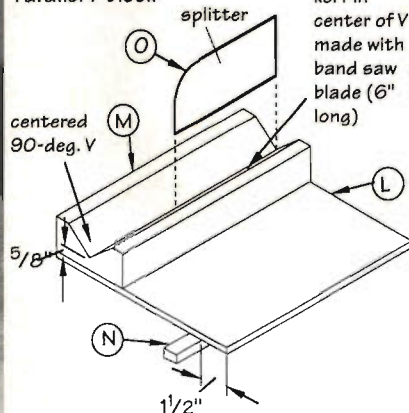
Parts of the fence



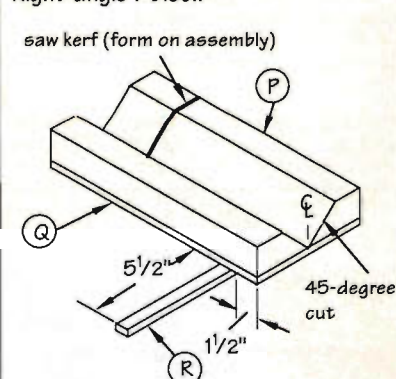
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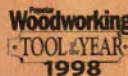
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Continued from page 18

Prepare the base (L) and attach it to the bottom of the block with glue and brads. Size the guide (N) so it will fit snugly in the table's miter gauge slot. A little on the snug side is good so the accessory won't move.

To set up the parallel V-block, put the guide in place in the table groove and position the block/base assembly so the cut-path of the saw blade will be on the center of the V-cut. Mark the position of the guide and attach it to the underside of the base using glue and brads. Place the accessory in position and, with a fine saw blade mounted, saw a kerf about 6" long.

Make the splitter (O) by rounding off the top, forward edge and smoothing the edge. The splitter should fit tightly in the kerf. If not, cover the bottom edge with plastic tape to thicken it.

For the right-angle V-block, shape the guide (R) so it will ride smoothly in the table slot. Put the guide in the slot and position the V assembly (P & Q) so the angle between its forward edge and the side of the saw is 90 degrees. Mark the position of the guide and then attach it to the block with glue and small nails.

Two Sawing Guides

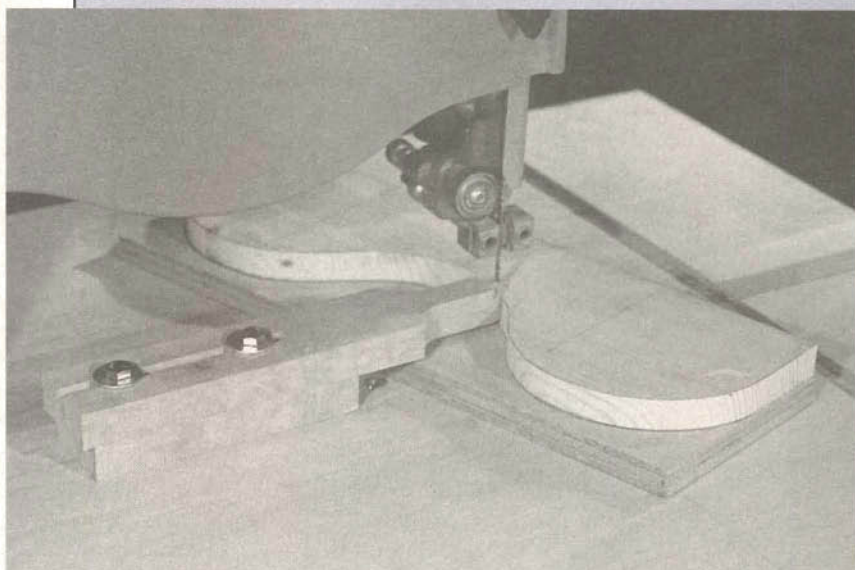
Shape the front end of the guide (S & U) on the band saw and smooth the sawed edges with a drum sander. Drill a $\frac{5}{16}$ " end-hole for the slot and saw out the waste. The guide is secured to the jig's table with $\frac{5}{16}$ " bolts that thread into the inserts installed in the table. The pattern sawing guide is shaped like the one made for parallel curves except that the slot is shorter and the business end is notched to fit the saw blade that is used. The riser (T) is needed so the guide will be elevated above the workpiece. **PW**

Excerpted from:

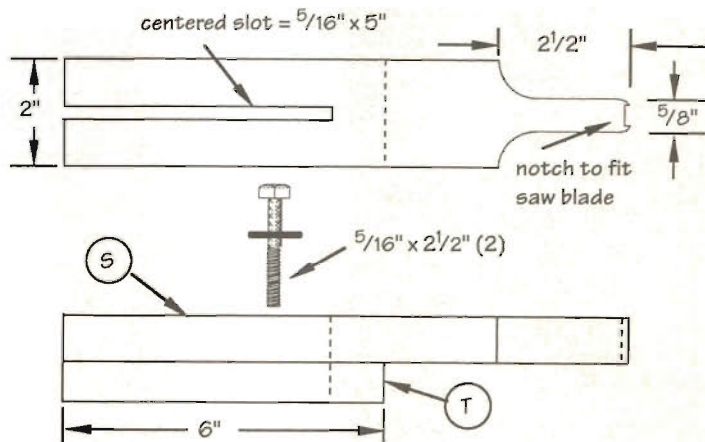
The Ultimate Woodshop Jig Book
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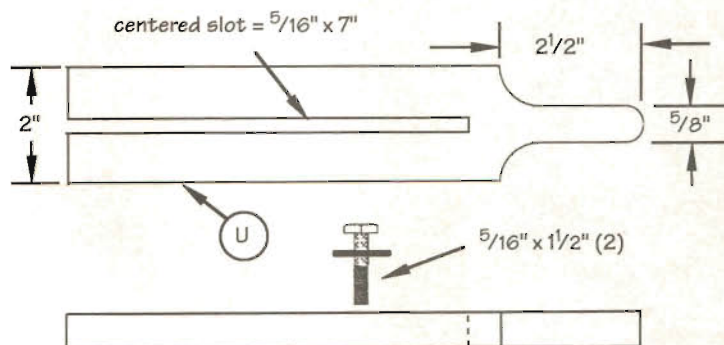
The Guides



Pattern-sawing guide



Parallel curves guide



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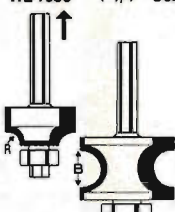
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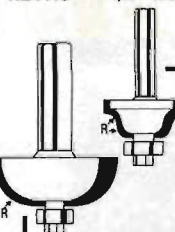
Roundover Bits with Bearing

1/4" Shank	Radius	
WL-1040	1/16"	*9.
WL-1041	1/8"	*9.
WL-1042	3/16"	*9.
WL-1043	1/4"	*9.
WL-1044	5/16"	*10.
WL-1045	3/8"	*11.
WL-1046	1/2"	*13.
1/2" Shank		
WL-1049	1/8"	*9.
WL-1042-5	3/16"	*9.
WL-1050	1/4"	*9.
WL-1044-5	5/16"	*10.
WL-1051	3/8"	*12.
WL-1052	1/2"	*13.
WL-1053	5/8"	*16.
WL-1054	3/4"	*18.
WL-1055	7/8"	*25.
WL-1056	1"	*27.
WL-1057	1-1/8"	*30.
WL-1058	1-1/4"	*30.



Bullnose Bits with Bearing

1/4" Shank • Bead	
Opening	
WL-1100	1/4" *12.
WL-1101	3/8" *14.
WL-1102	1/2" *16.
WL-1103	5/8" *18.
WL-1104	3/4" *19.
1/2" Shank	
WL-1110	1/4" *12.
WL-1111	3/8" *14.
WL-1112	1/2" *16.
WL-1113	5/8" *18.
WL-1114	3/4" *19.
WL-1115	1" *22.
WL-1116	1-1/8" *25.
WL-1117	1-1/4" *28.
WL-1118	1-1/2" *32.



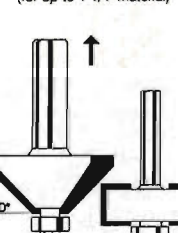
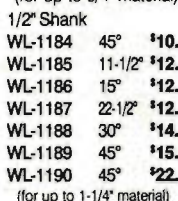
1/4" Shank • Radius	
WL-1159	1/8" *10.
WL-1160	3/16" *10.
WL-1161	1/4" *11.
WL-1162	3/8" *13.
WL-1163	1/2" *14.

Cove Bits (continued)

1/2" Shank	
WL-1169	1/8" *10.
WL-1170	1/4" *11.
WL-1171	3/8" *13.
WL-1172	1/2" *14.
WL-1173	5/8" *18.
WL-1174	3/4" *20.

Chamfer Bits

1/4" Shank • Degree	
WL-1180	15° *10.
WL-1181	25° *10.
WL-1182	45° *12.
WL-1183	45° *14.
(for up to 3/4" material)	
1/2" Shank	
WL-1184	45° *10.
WL-1185	11-1/2° *12.
WL-1186	15° *12.
WL-1187	22-1/2° *12.
WL-1188	30° *14.
WL-1189	45° *15.
WL-1190	45° *22.
(for up to 1-1/4" material)	



1/4" Shank • Kerf	
WL-1220	1/2" *11.
WL-1220-2	1/16" *10.
WL-1220-3	1/8" *10.
WL-1220-4	1/4" *10.
WL-1220-5	3/8" *10.
1/2" Shank	
WL-1225	1/2" *11.
WL-1225-2	1/16" *10.
WL-1225-3	1/8" *10.
WL-1225-4	1/4" *10.
WL-1225-5	3/8" *10.
WL-1225-6	3/4" *12.

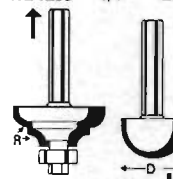
1/4" Shank • Radius	
WL-1230	5/32" *13.
WL-1231	1/4" *15.
1/2" Shank	
WL-1235	5/32" *13.
WL-1236	1/4" *15.

1/4" Shank • Radius	
WL-1240	5/32" *18.
WL-1241	1/4" *20.
1/2" Shank	
WL-1245	5/32" *18.
WL-1246	1/4" *20.

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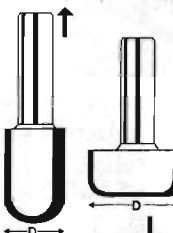
Classical Ogee Bits

1/4" Shank • Radius	
WL-1250	5/32" *18.
WL-1251	1/4" *20.
1/2" Shank	
WL-1252	5/32" *18.
WL-1253	1/4" *20.



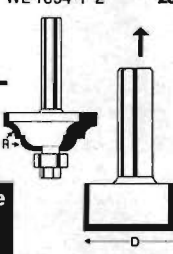
1/4" Shank • Diameter	
WL-1370	1/8" *10.
WL-1371	1/4" *8.
WL-1371-1	3/8" *9.
WL-1372	1/2" *10.
WL-1373	3/4" *12.

1/2" Shank • Diameter	
WL-1375	1/4" *8.
WL-1375-1	3/8" *11.
WL-1376	1/2" *12.
WL-1377	3/4" *14.
WL-1378	1" *16.



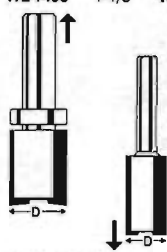
1/4" Shank • Diameter	
WL-1380	7/16" *13.
WL-1381	3/4" *15.
1/2" Shank	
WL-1385	3/4" *15.
WL-1386	1-1/4" *18.

1/4" Shank • Diameter	
WL-1390	3/4" *12.
1/2" Shank	
WL-1391	3/4" *12.
WL-1392	1" *14.
WL-1393	1-1/4" *15.
WL-1394	1-1/2" *16.
WL-1394-1	2" *28.

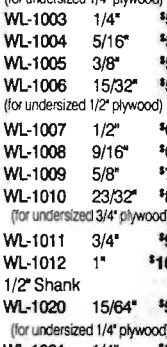


Pattern Cutting Bit

1/4" Shank • Diameter	
WL-1400	1/2" *12.
WL-1401	5/8" *12.
WL-1402	3/4" *12.
1/2" Shank	
WL-1405	3/4" *15.
WL-1406	1-1/8" *16.



1/4" Shank • Diameter	
WL-1001	1/8" *10.
WL-1002	3/16" *5.
WL-1002-5.5	5.5mm *5.
(for undersized 1/4" plywood)	
WL-1003	1/4" *5.
WL-1004	5/16" *5.
WL-1005	3/8" *5.
WL-1006	15/32" *5.
(for undersized 1/2" plywood)	
WL-1007	1/2" *6.
WL-1008	9/16" *6.
WL-1009	5/8" *7.
WL-1010	23/32" *8.
(for undersized 3/4" plywood)	
WL-1011	3/4" *9.
WL-1012	1" *10.
1/2" Shank	
WL-1020	15/64" *5.
(for undersized 1/4" plywood)	
WL-1021	1/4" *5.
WL-1019	5/16" *5.
WL-1022	3/8" *5.
WL-1023	7/16" *5.
WL-1024	15/32" *5.
(for undersized 1/2" plywood)	
WL-1025	1/2" *6.
WL-1027	5/8" *8.
WL-1028	23/32" *8.
(for undersized 3/4" plywood)	
WL-1029	3/4" *9.

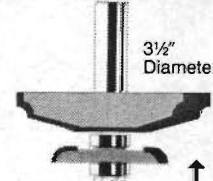


1/4" Shank • Diameter	
WL-1001	1/8" *10.
WL-1002	3/16" *5.
WL-1002-5.5	5.5mm *5.
(for undersized 1/4" plywood)	
WL-1003	1/4" *5.
WL-1004	5/16" *5.
WL-1005	3/8" *5.
WL-1006	15/32" *5.
(for undersized 1/2" plywood)	
WL-1007	1/2" *6.
WL-1008	9/16" *6.
WL-1009	5/8" *7.
WL-1010	23/32" *8.
(for undersized 3/4" plywood)	
WL-1011	3/4" *9.
WL-1012	1" *10.
1/2" Shank	
WL-1020	15/64" *5.
(for undersized 1/4" plywood)	
WL-1021	1/4" *5.
WL-1019	5/16" *5.
WL-1022	3/8" *5.
WL-1023	7/16" *5.
WL-1024	15/32" *5.
(for undersized 1/2" plywood)	
WL-1025	1/2" *6.
WL-1027	5/8" *8.
WL-1028	23/32" *8.
(for undersized 3/4" plywood)	
WL-1029	3/4" *9.

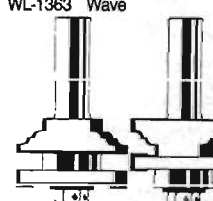


1/4" Shank • Radius	
WL-1250	5/32" *18.
WL-1251	1/4" *20.
1/2" Shank	
WL-1252	5/32" *18.
WL-1253	1/4" *20.

For the Shaper
Lock Mitre WL-1581 *40.

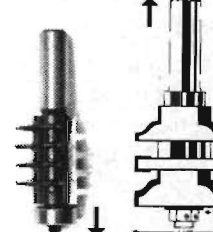


Horizontal Panel Raiser with Undercutter • 1/2" Shank	
WL-1346	Ogee *49.
WL-1347	Traditional *49.
WL-1348	Convex (Cove) *49.
WL-1359	12° Facecut with Quarter Round *49.
WL-1363	Wave *49.



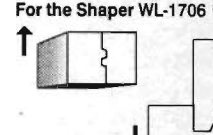
2-piece Rail & Stile Cutter Sets	
1/2" Shank	Set
WL-1360	Ogee Profile *59.
WL-1361	Roundover *59.
WL-1362	Cove & Bead *59.

1-piece Rail & Stile Cutter Sets	
Just raise the cutter to make the matching cut. No changing or reversing.	
1/2" Shank	
WL-1365	Ogee Profile *49.
WL-1366	Roundover *49.
WL-1367	Cove & Bead *49.
WL-1368	Wedge *49.
WL-1374	Dbt Roundover *49.



Finger Joiner Router Bit	WL-1429 *39.
For the Shaper WL-1580 *89.	

Reversible Glue Joint	WL-1430 1-3/4" Diam *35.
For the Shaper WL-1706 *35.	



Drawer Corner Lock	
Makes drawer side separation virtually impossible	
1/2" Shank	
WL-1435	For 1/2" material *30.

SHAPER CUTTERS

3/4" BORE	
Corner Round	
WL-1509	1/8" *22.
WL-1510	1/4" *24.
WL-1511	3/8" *26.
WL-1512	1/2" *26.
WL-1513	3/4" *30.
WL-1514	1" *32.
WL-1515	1-1/4" *38.

Bead	
WL-1520	1/4" *24.
WL-1521	3/8" *26.
WL-1522	1/2" *26.
WL-1523	3/4" *28.
WL-1524	1" *30.

Flute	
WL-1530	1/4" *24.
WL-1531	3/8" *26.
WL-1532	1/2" *26.
WL-1533	3/4" *28.
WL-1534	1" *30.

Rabbeting/Straight	
WL-1540	1/4" *24.
WL-1541	3/8" *26.
WL-1542	1/2" *26.
WL-1543	3/4" *28.
WL-1544	1" *30.
WL-1545	1-1/2" *32.
WL-1546	2" *48.



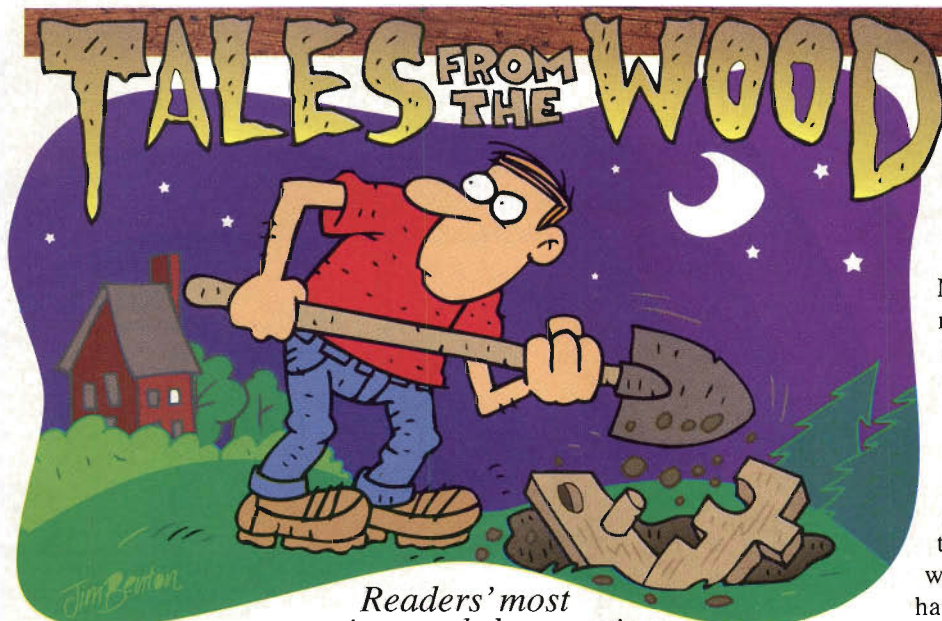
SHAPER CUTTERS 3/4" BORE	
1-piece Rail & Stile	
Just raise the cutter to make the matching cut. No changing or reversing.	
WL-1500	Roman Ogee *89.
WL-1501	Roundover *89.
WL-1502	Cove & Bead *89.
WL-1503	Dbt Roundover *89.

WL-1600	
WL-1601	
WL-1602	
WL-1603	
WL-1604	
WL-1605	

Panel Raisers (Shaper Cutter)	
3/4" Bore	
WL-1600	Ogee *59.
WL-1601	15° Facecut *59.
WL-1602	18° Traditional *59.
WL-1603	Convex (Cove) *59.
WL-1604	12° Facecut with Quarter Round *59.
WL-1605	Wave *59.

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Keep Your Hewn Huon Safe

The sun had just set as I neared our home in Adelaide in South Australia. As I walked our dog I thought about the great project on which I was about to embark. I was about to start building a small chest for our newborn son out of huon pine.

Now for those who may not be immediately familiar with this rare timber I had better fill you in. It grows only in Tasmania and the mature trees grow to over a thousand years of age. It is extremely slow growing with over 60 growth rings to an inch not being uncommon. The rarity of the wood, its wonderful fragrance and the almost non-renewable nature of the tree make it very expensive, and I had just paid \$40 for a piece that was 2" x 4" x 20".

I had spent the previous day resawing the small plank and jointing the pieces in readiness for the fancy dovetails and other fiddly bits that I thought the project deserved. I had placed the sawn components in a cardboard box in the garden shed, which was our hold-all for everything from garden tools, to paint, to firewood.

As I approached the house I was brought out of my reverie by the sight of smoke coming out of our home's chimney. "That's jolly nice of her," I fondly thought of my wife, as lighting the fire in the evening was usually one of my chores. I wasn't even concerned when my next muse was, "I wonder what she used for kindling?"

I'm sure you can guess the rest. As I entered the living room, my heart sank to see a half-full box of beautifully machined huon pine components and the most beautifully aromatic (if expensive) fire I ever wish to behold!

*Matthew Cook
Ann Arbor, Michigan*

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Turn your favorite tale from the woodshop into a \$150 gift certificate from Lee Valley Tools in *Popular Woodworking's* "Tales from the Wood" contest. We're looking for your funniest, most embarrassing or incredible story. And if we can learn something from your yarn — even better.

Each issue, our editors choose the best tale and print it here. Runners-up receive a Veritas Marking Gauge (shown at right) from Lee Valley Tools, the catalog company that features an impressive array of quality woodworking tools, supplies and accessories. One final rule: Please, no stories about people getting hurt. That's not funny.

To make things easier, you can e-mail your tale and daytime phone number to us at PopWood@FWPubs.com or mail it to: Tales from the Wood • *Popular Woodworking* • 1507 Dana Ave. • Cincinnati, OH 45207. All entries become the property of *Popular Woodworking*.

Measure Twice — Then Subtract 1/2"

My wife and I make custom cabinets in New York City, where deliveries often involve a fight with small elevators. A few years (and many headaches) ago we built a 10'-tall cherry bookcase with an 83³/₄" upper case. The client's elevator door measured 84" exactly. When it came time to deliver, it was pouring rain and we were worried about damaging the hand-rubbed oil finish. However, we wrestled the case down our narrow stairwell from our third-story shop to the U-Haul parked across the street. At the client's building, we braved two more narrow cement stairwells to get it to the basement and then squeezed it into the elevator.

When we reached the 19th floor, however, the case wouldn't fit out the door! The elevator stopped 1/2" above the hallway floor.

After trying the 19th floor several times to no avail, we prepared to cut the case down in the basement laundry room. As we were looking for a place to plug in our jigsaw, an old elevator repairman approached us. He told us to load the elevator and pack in as many people as possible. We rounded up five strangers to ride with us to the 19th floor. With the extra weight, the elevator cable stretched 1/4" — just enough to fit the case through!

*Orin Zelenak
Brooklyn, New York*



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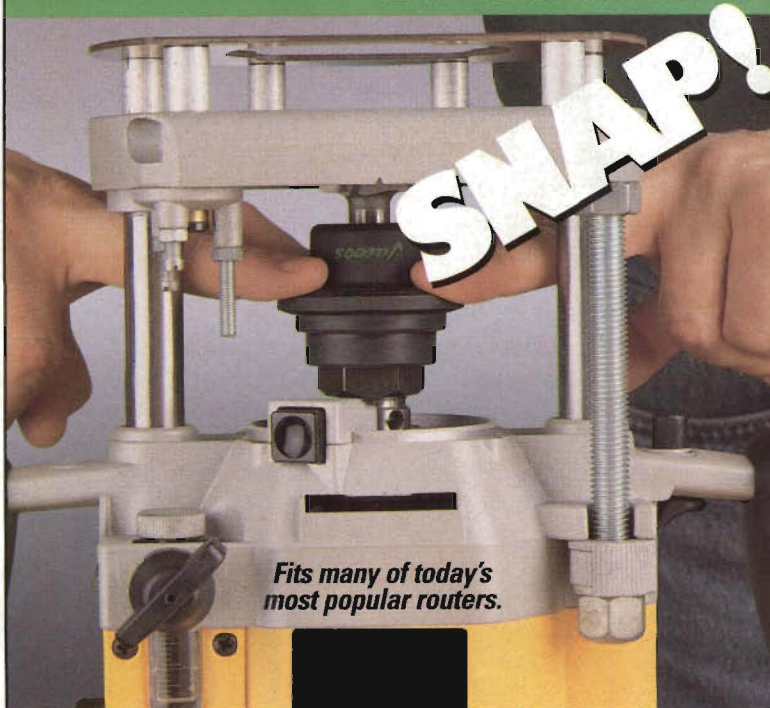


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Protecting Exterior Wood

Weapons in the battle to preserve your outdoor projects and property.

There is probably more misunderstanding about how to protect wood outdoors than about any other aspect of wood finishing. The need for a coating to protect exterior wood is much greater than for interior wood because objects outdoors are subjected to the ravages of sun and rain. When sunlight or water come into frequent contact with wood, they cause the wood to lose its color, split, warp and often rot.

The best way to protect wood exposed to sun and rain is to apply a paint or finish that blocks sunlight and moisture and holds up itself to these destructive elements.

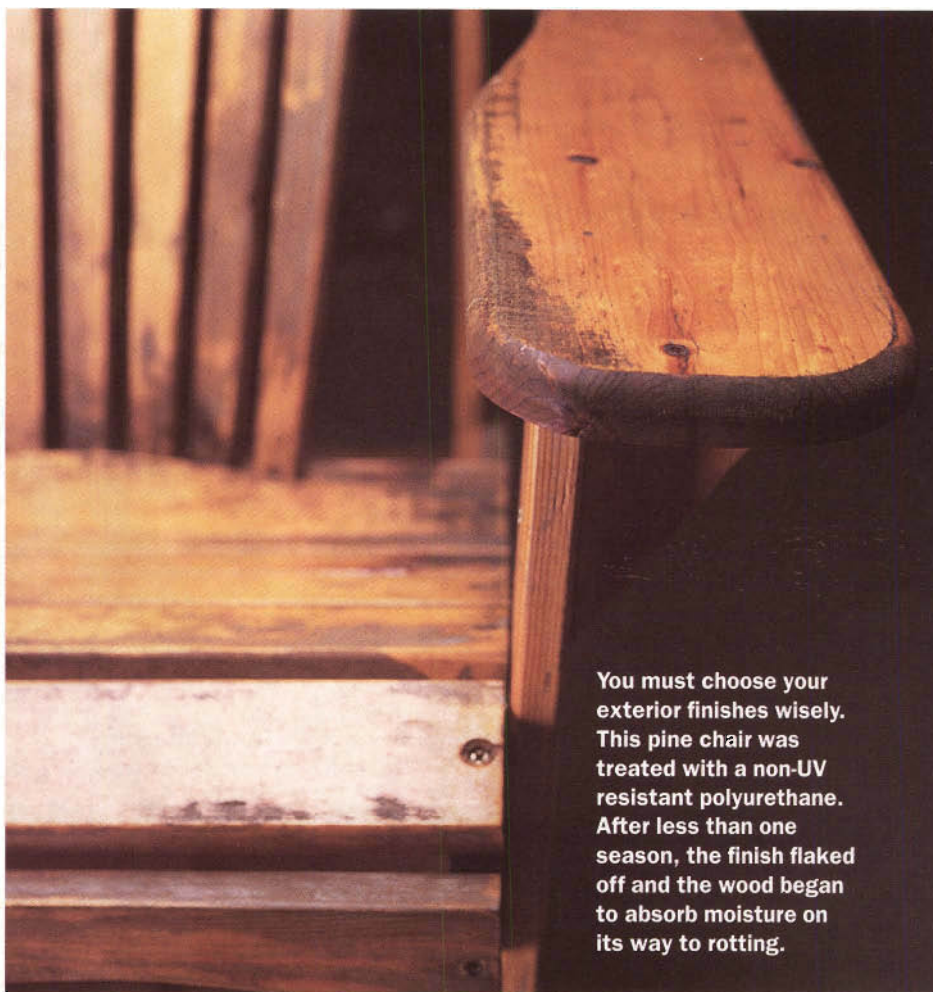
Effects of the Sun

Light is the principal enemy of paints and finishes. Over time, ultraviolet rays, which are strongest from direct sunlight, break down paints. The dull and sometimes chalky result is visible on cars and buildings that have been exposed to the sun for many years. If you catch the problem before the paint is damaged all the way through, you often can rub off the dullness with abrasives (contained in many car polishes, for example) and expose paint that looks shiny and new.

UV rays also break down clear finishes, but most peel before dulling and chalking become problems. Clear finishes peel because the UV rays penetrate the film and destroy the lignin that glues the cellulose cells of wood fiber together. The surface cells separate, and the finish bonded to these cells peels.

The best sun-blocking agents, and thus the best protection for finishes applied outdoors, are pigments (contained in paints and stains). But pigments hide the wood, and many people would rather have it visible. The next best sun-blocking agents are UV absorbers, which are similar to sunscreen agents used in suntan lotions. They convert ultraviolet light energy to heat energy, which dissipates.

UV absorbers don't hide wood, and they are fairly effective



You must choose your exterior finishes wisely. This pine chair was treated with a non-UV resistant polyurethane. After less than one season, the finish flaked off and the wood began to absorb moisture on its way to rotting.

at preventing wood deterioration underneath a finish. But they are expensive, and a significant amount — 1 to 3 percent by weight — has to be in the finish to be effective. It isn't enough to add just a few drops to a vat so it can be claimed, as many manufacturers do, that the product contains UV absorbers.

The most common finishes that contain sufficient UV absorbers are marine varnishes, which cost more than \$50 a gallon and are difficult to find except at marinas.

Effects of Moisture

Moisture causes paints and finishes to peel when it gets between the coating and the wood. Paints resist moisture penetration well, but most clear finishes don't. Water repellents, which contain a low-surface-tension waxy substance (manufacturers use different types), cause water to bead but don't totally keep it out of the wood.

The best moisture-resistant, clear finishes are varnishes called spar or marine varnish that are made very flexible so they can keep up with extreme wood movement. Varnishes made with phenolic resin and tung oil are best because they don't crack as quickly as those made with polyurethane resin.

Bob Flexner operates a woodworking and refinish shop in Norman, Oklahoma. He teaches classes on finishing and furniture restoration each summer at Marc Adams School of Woodworking in Indiana 317-535-4013 and at the Center for Furniture Craftsmanship in Maine 207-594-5611.

How to Choose

The best way to protect wood outdoors is to paint it. Paint repels water and blocks UV rays very effectively. There are two major categories of paint: oil-base and water-base (latex). Oil-base paints are best for objects such as chairs and picnic tables because latex paints don't wear as well.

Oil-base primer is also best on wood that has been exposed to the weather for a month or more because it penetrates deeper than latex primers. (As mentioned, UV light breaks down the lignin near the wood's surface, making it difficult for paint to get a good hold.) If the wood is freshly milled or sanded, acrylic-latex primers perform well.

Latex paint offers the best protection for wood siding because it allows moisture vapor, which is generated inside from cooking, showers, etc., to pass through better than oil-base paint. If the moisture vapor can't get through the paint, it builds up behind the paint and causes it to peel. A primer coat of oil-base paint is not thick enough to stop the penetration.

No clear finishes work as well as paint if exposed to bright light, but expensive marine varnishes come closest. Keep in mind, however, that these finishes are very glossy and relatively soft (for flexibility), and you need to apply eight or nine coats to reach maximum UV resistance. Because the UV absorbers don't prevent the finish itself from deteriorating, you need to sand off surface deterioration and apply a few additional coats whenever the finish begins to dull, which could be as often as once a year in Southern exposures.

Commonly available spar varnishes that don't contain sufficient UV absorbers won't hold their bond to wood that is exposed to sunlight. Interior/exterior polyurethanes have an even shorter life.

Deck Finishes

Decks present a special case because paints and clear finishes are so difficult to repair when they peel, which occurs fairly rapidly because there are so many places where water can get in and work its way behind the coating. Most people who have applied paint or clear finish to a deck have regretted it.

Unfortunately, there are no good alternatives. The best solution is to use high-quality redwood heartwood and leave it unfinished. The wood will turn gray in a few years, but it won't rot. Because it is cut on the radius (quartersawn), the boards are stable and resist splitting. Heartwood cedar performs almost as well as redwood.

Pressure-treated pine, hemlock and fir are the most widely used woods for decks because they are less expensive than redwood or cedar and even more resistant to rot. But pressure-treated wood is not cut on the radius, so it splits severely when exposed to sun and rain. Water repellents often claim to retard this deterioration, but none works well because they don't block UV rays.

The best way to protect a deck made of pressure-treated wood, assuming you've ruled out paint, is to apply deck stain. Stains contain enough pigment to partially block UV rays and

Right:

Left unfinished, white oak and other weather-resistant woods will turn a silvery-gray. This adirondack chair has survived seven seasons outside with little deterioration.



Left

Pressure-treated decks are resistant to rot, but they split when exposed to the elements. The best way to stop this is a deck stain.



Below

UV rays break down clear finishes, such as the polyurethane on this front door. Clear finishes peel because the UV rays penetrate the film and destroy the lignin that glues the cellulose cells of wood fiber together.



contain enough finish, which glues the pigment to the wood, to partially block water. But stains don't build (solvent-based stains less so than water-based stains), so they don't peel.

You can also apply a stain to redwood or cedar to help maintain or change the color, but no matter which wood you are coating, you should recoat whenever the stain begins wearing through. **PW**

Burlington Farmer's DESK

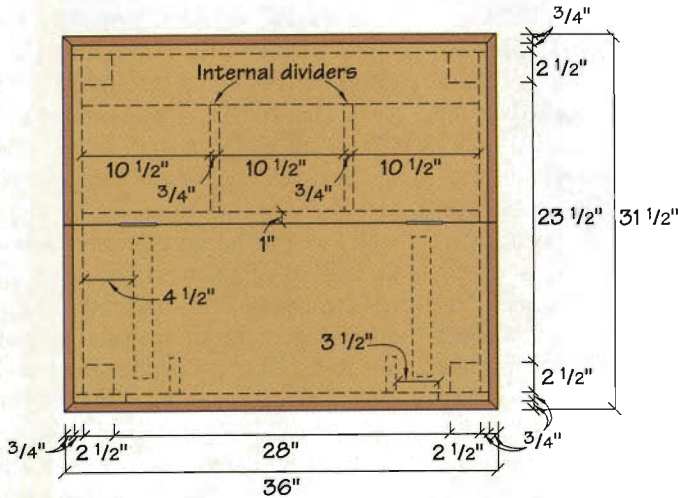
*This primitive and unusual
lift-lid desk proves that pine
and nails can go a long way.*

IT WAS HOTTER than two rats fighting in a wool sock when Senior Editor David Thiel and I were scouring an antiques show in Burlington, Ky., for ideas and old tools. We were buying some lemonade (which, ounce for ounce, was more expensive than premium gasoline) when Dave saw this desk sitting behind

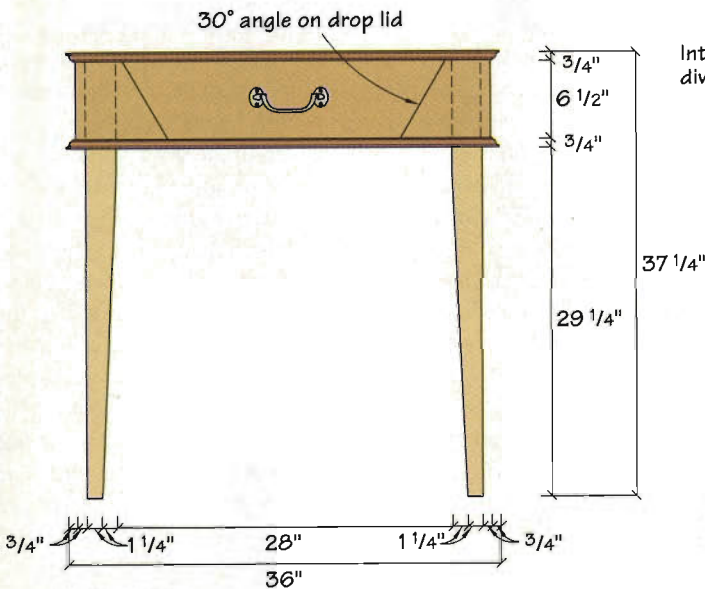
*Christopher Schwarz is managing editor
of Popular Woodworking.*



DIAGRAMS



Plan



Elevation

Schedule of Materials: Burlington farmer's desk			
No.	Item	Dimensions T W L	Material
4	Legs	2 1/2" x 2 1/2" x 36 1/2"	Pine
2	Front/back	3/4" x 7 1/4" x 34 1/2"	Pine
2	Sides	3/4" x 7 1/4" x 30"	Pine
2	Tops	3/4" x 15" x 34 1/2"	Pine
1	Bottom*	3/4" x 28 1/2" x 33"	Pine ply
2	Vert. dividers	3/4" x 9 1/2" x 6 1/2"	Pine
1	Horiz. dividers	3/4" x 9 1/2" x 33"	Pine
2	Braces for front	3/4" x 3" x 3"	Pine
2	Battens	3/4" x 2" x 10"	Pine
3	Drawer fronts	3/4" x 2 13/16" x 10 3/8"	Scraps
6	Drawer sides	1/2" x 2 13/16" x 10"	Pine
3	Drawer backs	1/2" x 2 5/16" x 9 7/8"	Pine
3	Drawer bottoms	1/4" x 9 7/8" x 9 5/8"	Plywood
	Ogee trim	25' of 3/4" x 3/4"	Pine

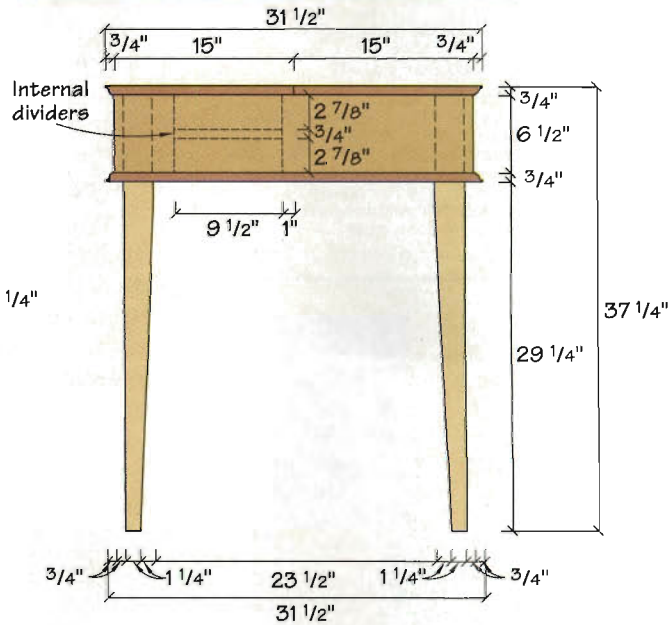
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Profile

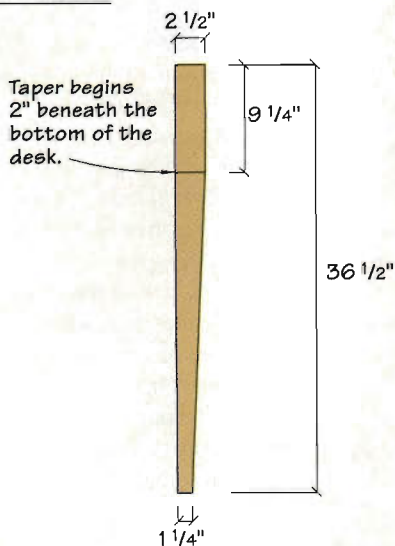


Diagram of leg taper

What's 'glaze'? Where can I get it?

Because oil finishes reign supreme in many home shops and catalogs (unfortunately), an often overlooked finishing tool is glaze. What's glaze? It's a really thick stain or a thinned paint that you apply between layers of clear finish. Glaze is used by many professional finishers to add depth to the wood or to even out the color among different-looking boards in their furniture. Plus, it's great for creating an antiqued look. Here are three sources for glaze. 1. A professional paint store. Painters use glaze all the time, so most pro paint stores carry it. 2. Woodworker's Supply (800-645-9292) carries Behlen's Shading and Glazing Stains in eight colors. One quart \$15.95. 3. Merit Industries (800-856-4441) carries three brands of glaze at discount prices.

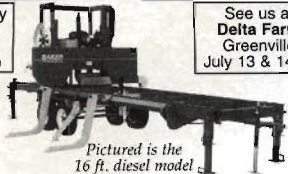
For more information on glazing, read Bob Flexner's "Understanding Wood Finishing" (Rodale Press).

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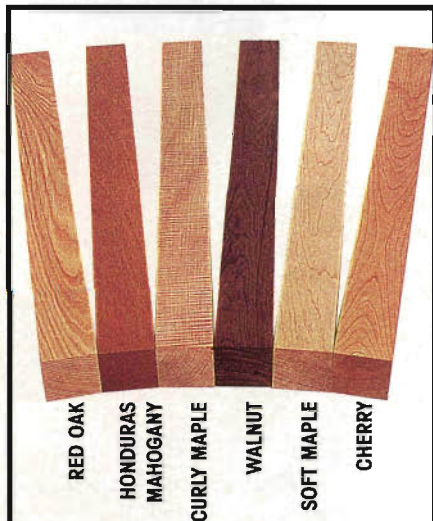
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DESK

an old truck. We should have risked the wrath of our wives and bought it, but instead we made a rough sketch that became the desk you see here.

It's doubtful the person who built the original was more than a casual woodworker because he or she hadn't accounted for wood movement at all. True, the desk had survived — despite its cross-grain construction problems — but we felt compelled to remedy some of its wood movement troubles when we built this reproduction. However, I just had to bite my lip and hope for the best when I nailed the moulding to the end grain on the top pieces. You could get around this problem with a sliding dovetail, but that seemed silly for a primitive piece.

Construction is mostly nails and glue, although the box is made using finger joints. Then you nail in a plywood bottom and nail the legs into notches cut in the corners of the plywood. The fixed part of the top is nailed and glued to the box. The hinged top is nailed, glued and reinforced with braces to the angled front piece. Nail in some dividers, build some drawers and you're done.

Begin construction by cutting all the pieces to size according to the Schedule of Materials. Cut the two tapers on each leg according to the diagram (use a tapering jig on your table saw or cut them on a band saw and clean up the cut on a jointer). Now cut the 1/2"-wide finger joints for the box on your table saw (read "Benjamin Seaton's Tool Chest," September 1998 #104, to learn how to make a jig to do this). Cut the angled front out of the front piece with your jig-saw or band saw.

Now fit the bottom. I used knotty pine plywood. Beware: It's so expensive (about \$60 for a 4' x 8' sheet) you'll feel like you've been beaten like a tied-up goat. So you might want to buy a decent grade of construction plywood from the home center and sand the heck out of it, instead. Cut four 2 1/2" x 2 1/2" notches in the pine plywood's corners to make room for the legs. Glue a 1/16"-thick strip of pine to the front edge of the plywood to hide that edge when the desk is open. Then dry-fit the four sides of the box around the bottom. When you've got a

good fit, glue the finger joints together around the bottom. Clamp and allow to dry. When dry, nail the bottom in place (moulding will cover the nail holes). Now glue and nail the legs in place. Clamp and allow to dry.

Next work on the top. Cut the mortises for the two butt hinges into the edges where the two top pieces will meet. Nail and glue the fixed top in place on the back half of the desk. Install the hinges on the two top pieces. Then glue and nail the angled front flush to the front edge of the top that pivots. Cut out the triangular braces and nail them in place behind the angled front piece for extra support. When everything seems to be working, screw the two battens to the flip top to help keep the pine from warping. Be sure to make the screw holes in the batten pieces elongated ovals that run with the grain. This will allow your top to shrink and expand without snapping the screw heads.

Now turn to the desk's interior dividers. They are joined by 3/4" x 4 3/4" lap joints so the dividers slide together and then slide in place inside the desk. Note that the vertical dividers are cut so that the grain runs from the top to the desk's bottom. This keeps you from seeing end grain on the dividers and stops the divider from eventually breaking the fixed top off your desk. Finish the inside of the desk, nail the dividers in place and then nail moulding to the two top pieces and the bottom edge of the box.

Next build your drawers. I used 1/4" dovetails to join the sides to the drawer fronts. Then I cut 1/4" x 1/2" rabbets on the back ends of the sides to hold the back piece in place. The plywood bottom is held in place in a 1/4" x 1/4" groove in the sides and drawer front. Glue some scraps in the box to serve as drawer stops.

To achieve the dirty-looking aged finish, first brush on one coat of orange shellac and allow it to dry. Rag on warm brown glaze, allow it to sit for about 15 or 20 minutes, and rub off most of it, except in the corners. Allow the glaze to dry overnight. Then cover the entire project with two coats of a clear finish.

Finally, cross your fingers and hope your pine is stable. **PW**

Makita

On-Site Performers

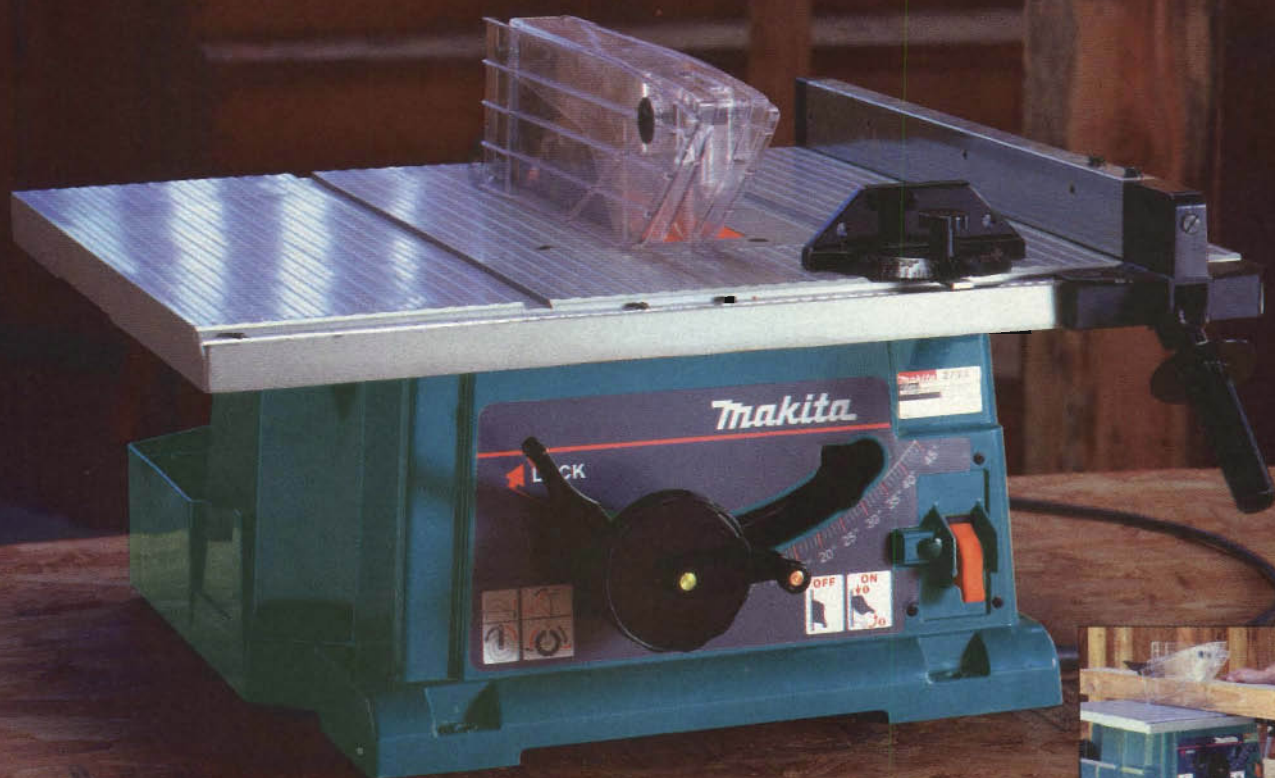
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RMS TITANIC'S *Deck Chair*

Only two deck chairs survived the sinking of the ill-fated oceanliner. Build your own reproduction with a band saw and a spindle sander.

ARRANGING DECK CHAIRS on the sinking *Titanic* is synonymous with futile gestures. Building a reproduction of one of the two known surviving chairs is anything but futile as you capture a piece of history and add an enduring piece of comfortable lounging furniture to the deck of your home.

Construction is more tedious than complicated, and two machines I found indispensable were a band saw and an oscillating edge belt/spindle sander from Ridgid. With all the interior and exterior curves, a spindle sander is almost essential, and Ridgid's combination machine made the job easier.

The first step is to plane the material to the proper thickness. I used 35 board feet of $\frac{3}{4}$ " mahogany, though teak would be more true to the original. The mahogany cost \$175 and hardware added another \$45, which seems steep until you compare it to the \$1,000 or more some stores charge for similar chairs.

1 Saw Twice • Start with the back crest rail and the arms. They're cut in a two-step process. Use the templates in the PullOut™ Plans to mark the top and front surfaces of each piece. Cut the top or vertical pattern of the crest rail first, then lay the piece face up and cut the bottom of the pattern. Leave the top flat until you've cut the mortises in the rail. Allow the back surface to rest against the band saw's table, rocking the piece as you cut. On the arms, cut the top surface pattern first, then flip the piece onto the inside edge and make the second cut.

2 Shaped and Drilled • Use the templates in the PullOut Plans to lay

out the rest of the pieces. Nest similar pieces (the back and foot rest slats, etc.) so you won't waste wood. Be sure to pay attention to grain direction on the legs. Maintain as much long-grain orientation as possible at stress points.

This is where the tedium begins. After band sawing each piece to rough size, sand it smooth. When cutting the slats for the seat and foot rest, leave the tenons uncut until the piece is sanded to shape, then mark the necessary $\frac{1}{2}$ "-thick tenon and cut it to finished size.

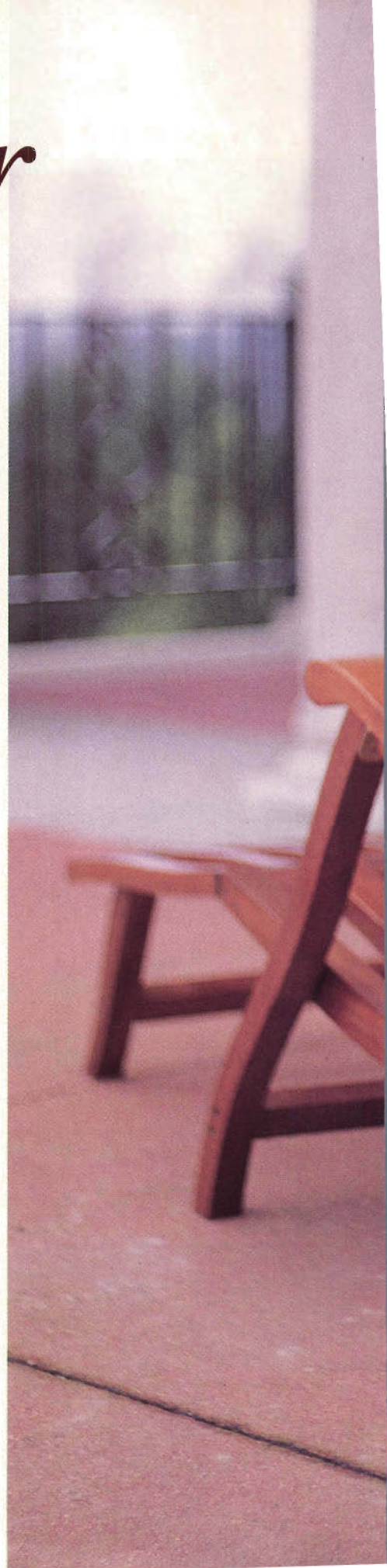
Next, mark the clearance holes and attachment points on the individual pieces, again using the templates in the PullOut Plans.

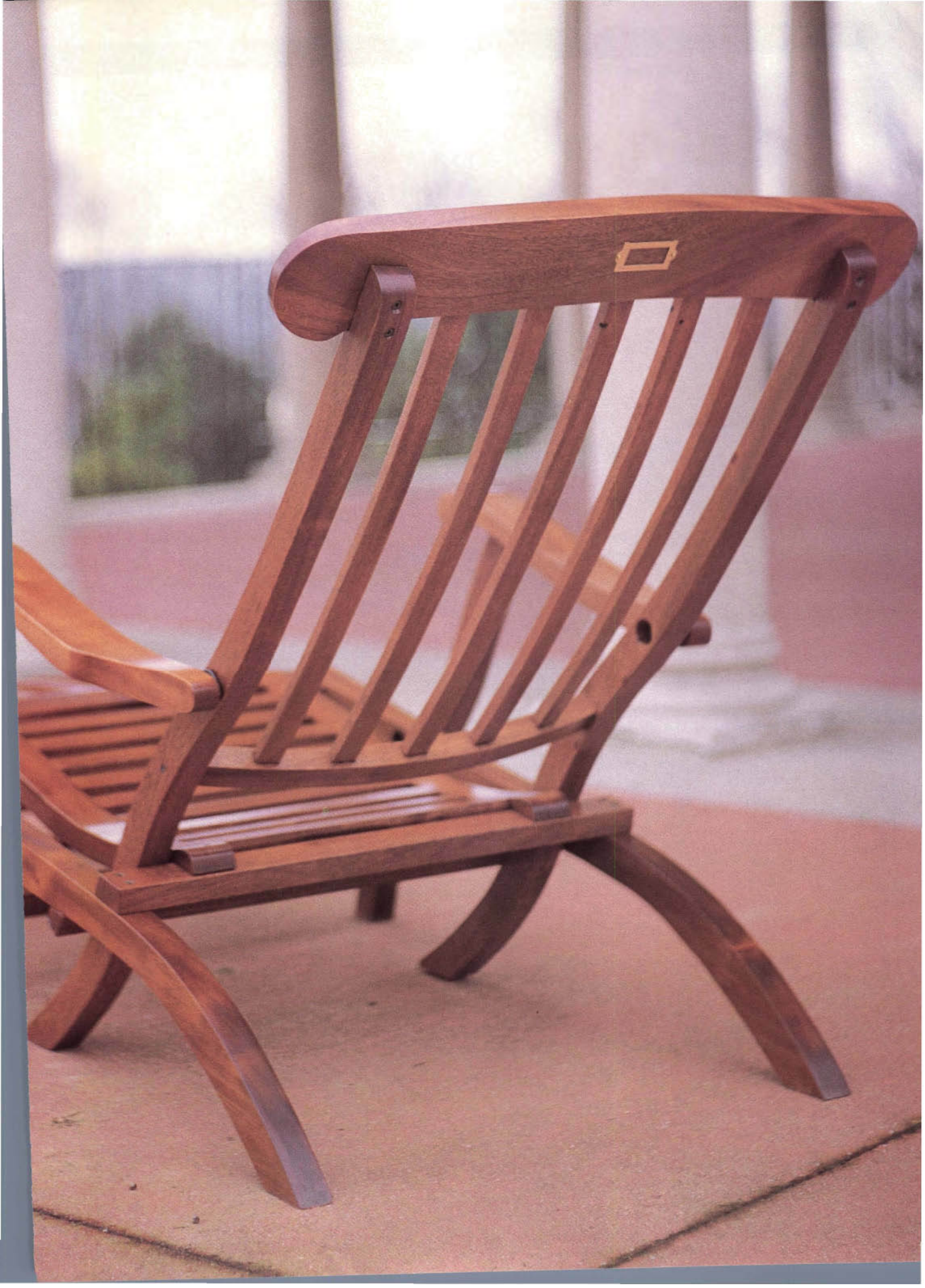
3 Mortise and Fit • Now transfer the mortise locations from the templates to the crest and back lower rail, the seat sides and the foot rest sides. The foot rail mortises are straightforward, but the mortises on the seat sides need to be cut free-hand, without using a fence. The mortises on the back crest need to be drilled at different depths as the piece is concave. Once the crest rail mortises are complete, band saw the top of the rail.

Assemble the chair before finishing to check the fit of all pieces. Start by assembling the back, center and front leg pieces with pivot hinges, and attach the arms to the center legs with drop-front hinges mounted to the bottom surface of the arm and the back edge of the leg. Make both the left and right sides, then attach the two halves by adding the stretchers and supports. The crest rail fits into beveled notches cut at the ends of each center leg. Use the rail itself to mark and fit the rail in place.

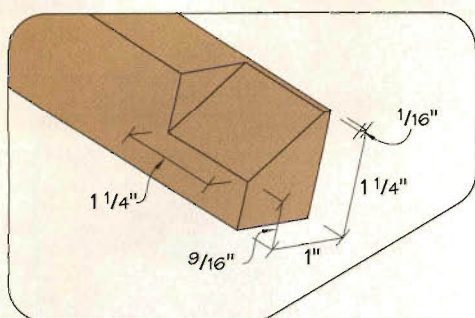
Next place the back slats in the mortises in the back lower rail, and clamp the rail in place between the front legs.

David Thiel is senior editor of Popular Woodworking.

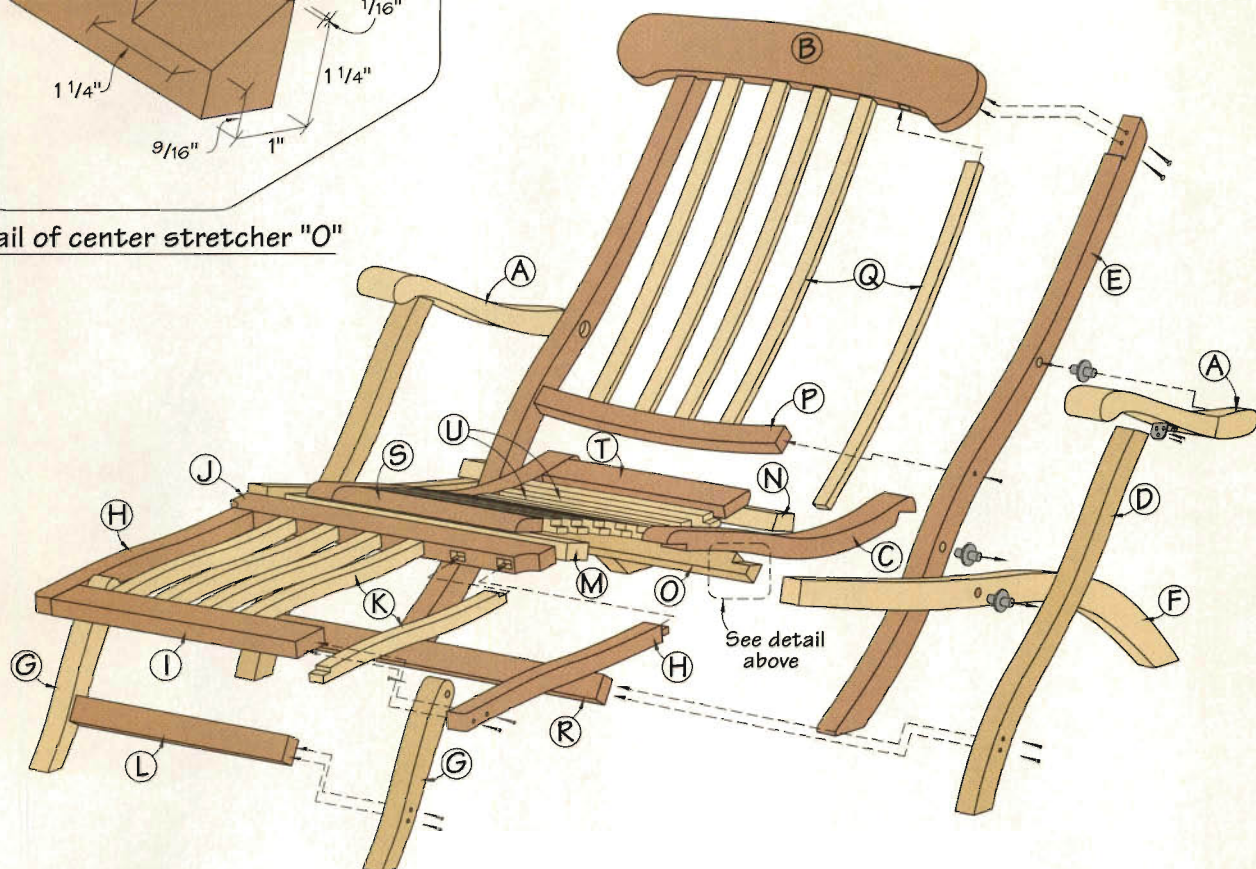




DIAGRAMS



Detail of center stretcher "O"



Schedule of Materials: Titanic's deck chair

No.	Let.	Item	Dimensions T W L	Notes
2	A	Arms	1 3/4" x 2 1/2" x 18"	Two-dimensional cuts
1	B	Crest rail	1 3/4" x 5" x 25 1/4"	Two-dimensional cuts
2	C	Seat sides	1 3/4" x 2 1/2" x 23 1/2"	Notched front & rear
2	D	Front legs	1 1/4" x 2 1/2" x 24 7/8"	
2	E	Center legs	1 1/4" x 3" x 41 1/4"	Notched for crest rail
2	F	Rear legs	1 1/4" x 5 3/4" x 37 3/4"	
2	G	Footrest legs	1 1/4" x 1 1/2" x 11 1/2"	
2	H	Footrest sides	1 1/4" x 1 5/8" x 18"	Drilled for threaded inserts
1	I	Footrest front	1" x 2 1/2" x 17"	
1	J	Footrest rear	1" x 2 1/2" x 21 3/4"	1" radius notches
5	K	Footrest slats	1" x 1 1/4" x 16 1/2"	Nest pieces to improve yield
1	L	Footrest stretcher	1" x 1 3/8" x 14 7/16"	
1	M	Seat support	1" x 2" x 20"	Mortised for hinges
1	N	Seat support	1" x 2" x 22 1/2"	30° bevel on front edge
1	O	Center stretcher	1" x 1 1/4" x 22 1/2"	30° notch on ends
1	P	Back stretcher	1" x 2" x 17"	
5	Q	Back slats	1" x 1 3/8" x 22 3/4"	Length is for longest slat
1	R	Front stretcher	7/8" x 1 1/2" x 22 7/8"	
1	S	Seat front	3/4" x 2 1/2" x 13"	Shaped front edge
1	T	Seat rear	3/4" x 2 1/2" x 13"	Back cut at 30 degree bevel
8	U	Seat slats	3/4" x 1" x 14"	1/2" x 1/2" tenons included

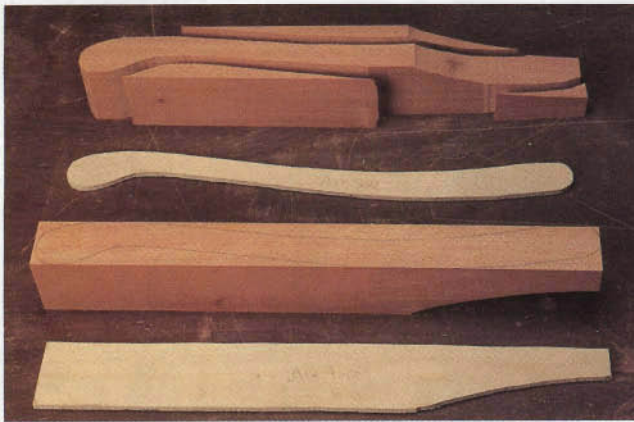
*Size is approximate and oversized to allow trim around piece.

Hardware Details



Attach the footrest legs (above) with threaded inserts and a brass screw. Attach the footrest with sewing machine hinges mortised into the rails (below).





1 WELL ARMED • On the arms, cut the top surface pattern first (below), then flip the piece onto the inside edge and make the second cut (above). Be sure to make a left and right arm.



3 HAND-FIT NOTCH • Using the lower stretcher to maintain the proper spacing, the crest rail is held in place and the notches are marked on the legs then cut and hand fit.

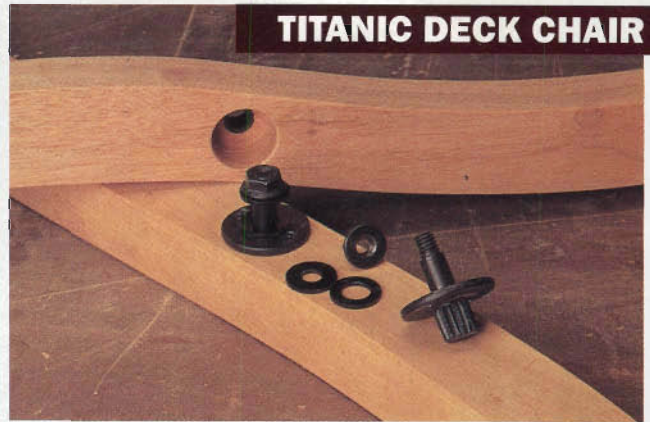
The slats will extend over the front of the crest rail and must be marked and cut to fit into the 1/2"-deep mortises in the rail. With the slats cut to length, fit them into the crest rail mortises and screw the lower back rail in place.

With the exception of the seat and the foot rest, the chair is essentially assembled. You may note that the chair does not sit perfectly flat. Wait until the seat and foot rest are attached to trim the legs to adjust the stance.

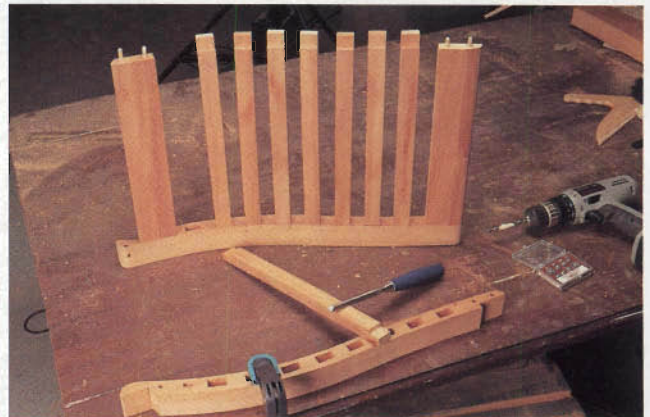
4 For Sitting • The seat assembles with the slats flush to the top of the sides. The seat front and rear pieces are joined to the sides with dowels. Though the template should give you a good fit for the seat sides, check your pieces in place. With the seat fit, attach it to the chair frame with screws up through the seat support rails.

Details at the End of Your Journey

The footrest's sides are joined to the rear rail with tenons, and the front rail is screwed between the sides. Attach the sides



2 HARDWARE MAKES THE CHAIR • The pivot hinge hardware allows the chair to fold. But pay careful attention to left, right and inside and out when drilling the two-step holes.



4 SHAPED SEAT • With the mortises cut in the seat sides, assemble the seat and sand the surfaces flush and smooth. The seat remains loose and is screwed to the frame.

Supplies

From Rockler, 800-279-4441

3 pair - pivot hinges #51243,
\$6.99 per pair

2 pair - sewing machine hinges
#32284, \$8.99 per pair

1 - card holder #27946, (2 per package) - \$1.79

2 - 1/4-20 threaded brass inserts
#33183 (10 per pack) \$2.99

2 - brass 1/4-20 rh screws #61416 (10 per package) \$3.49.

Ridgid's Belt/Spindle Sander is available at the Home Depot.

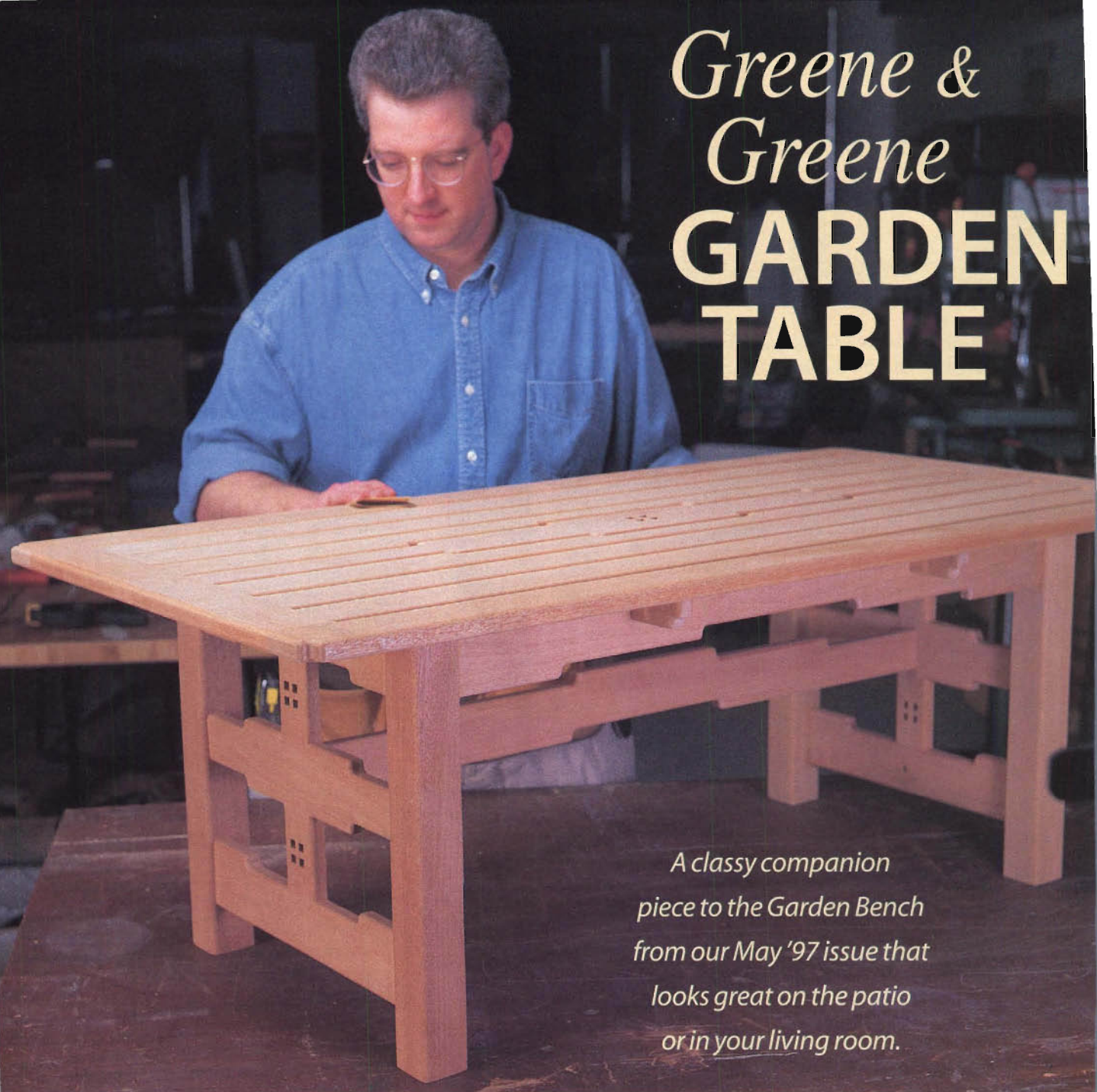
before assembling the foot rest.

I recessed the hinges that attach the footrest into the surface of the front seat support and the rear foot rest rail using a trim router and straight bit. The chair is now complete. Adjust the stance of the chair by trimming the legs. Start by leveling the front and back legs. Once they are level, trim the center legs to match, and finally trim the foot rest legs.

Disassemble and mark all the pieces and sand them to 150 grit. To finish the chair I applied a mahogany stain and gave the entire piece a coat of exterior-grade urethane for protection.

Two details finish the piece. Before finishing, apply a stick-on five-pointed star in the center of the crest rail to mimic the carved logo of the White Star line on the original. You can add a brass card holder to the back of the crest rail which, on the original, was used to identify the passenger the deck chair was reserved for.

You're now ready to enjoy the turn-of-the-century luxury of a first-class deck chair. Feel free to arrange the chair as necessary. **PW**



Greene & Greene GARDEN TABLE

*A classy companion
piece to the Garden Bench
from our May '97 issue that
looks great on the patio
or in your living room.*

A READER FROM CLAREMONT, CALIFORNIA, Everett Vinzant, liked our Greene & Greene Garden Bench in the May '97 issue (#96) so much he decided to build a coffee table to go with it. He sent us a photo of it, and we decided it was such a good idea we tweaked his nice design and built this table. We call this project "Revenge of the Cloud Lifts" because it's loaded with this undulating signature Arts & Crafts detail. Because there are so many cloud lifts, this is a good project to use template routing on a router table to make them all.

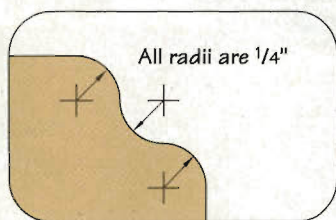
1 Making Templates • Begin by cutting the parts out according to the Schedule of Materials. Then make your

Jim Stuard is associate editor for Popular Woodworking.

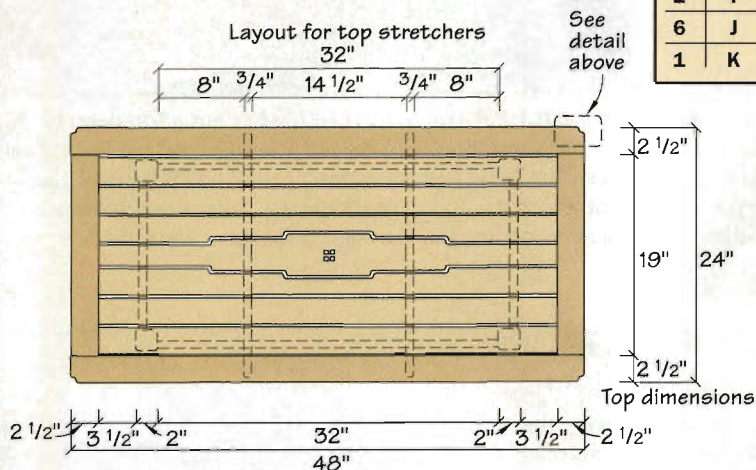
plywood templates using the patterns in the PullOut™ Plans. Mark a center line across each template. This will help you line up the parts for routing. Finish each template by adding two handles to the templates in the locations shown in the PullOut Plans.

2 Roughing the Parts • Mark a center line across parts B, C, D, F, G, K and on two top slats (J). Mark a center line down the middle and across parts E and K. These get a four-hole cutout. Make four copies of the small four-hole cutout and one of the larger four-hole patterns in the PullOut Plans. Cut the patterns to within 1/2" of the holes. Using a spray adhesive, attach the small patterns on the end uprights (E) and the large pattern on the center slat (K) lining up the cross hairs on the pat-

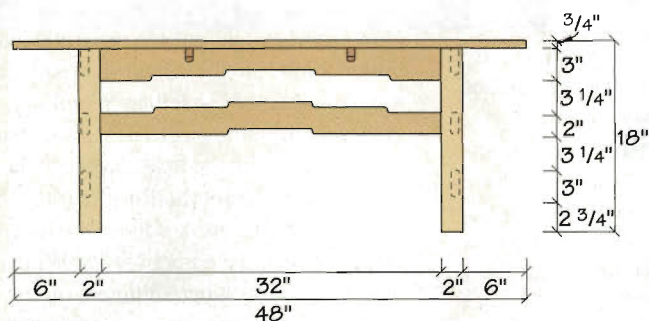
DIAGRAMS



Full-size detail of corner profile

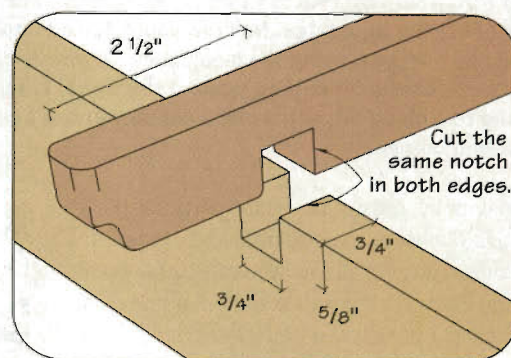


Plan

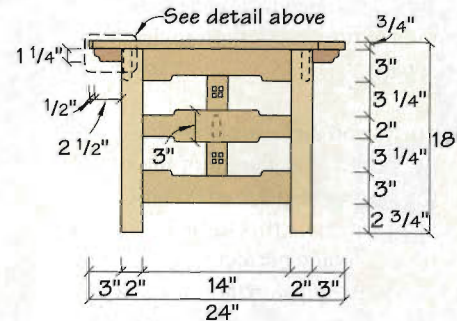


Elevation

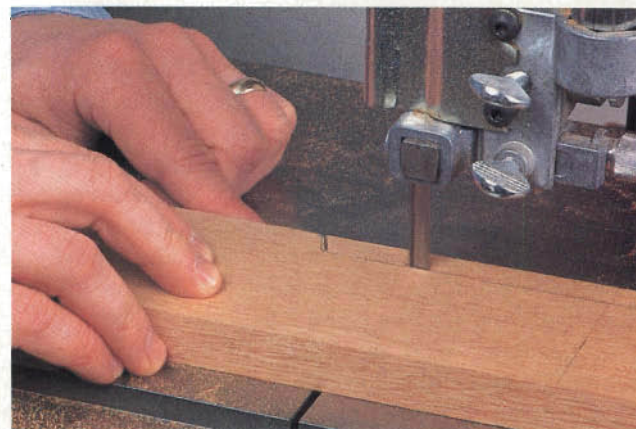
Schedule of Materials: Greene and Greene garden table				
No.	Let.	Item	Dimensions T W L	Material
4	A	Legs	2" x 2" x 17 1/4"	Mahogany
2	B	Long aprons	3/4" x 3" x 32"	Mahogany
4	C	Short aprons	3/4" x 3" x 14"	Mahogany
2	D	End divider	3/4" x 3" x 14"	Mahogany
4	E	End uprights	3/4" x 2" x 3 1/4"	Mahogany
1	F	Base stretcher	3/4" x 3" x 34"	Mahogany
2	G	Top stretchers	3/4" x 1 1/4" x 23"	Mahogany
2	H	Top frame long	3/4" x 2 1/2" x 48"	Mahogany
2	I	Top frame short	3/4" x 2 1/2" x 19"	Mahogany
6	J	Top slats	3/4" x 2 1/2" x 43"	Mahogany
1	K	Center slat	3/4" x 3" x 43"	Mahogany



Detail of top stretcher



Profile



1 MAKING TEMPLATES • Begin cutting out the 1/2" Baltic Birch templates by drilling holes at the proper corners. Raise the blade on the table saw into the middle of the stock to make the straight cuts. Band saw the rest and clean up the cloud lifts using a disc sander.

2 ROUGHING OUT THE PARTS • Use the center lines to index the template on what will be the back of each piece (it will eventually have nails driven into it) and draw the appropriate cloud lift or reverse cloud lift. Cutting close to the line, rough out these pieces on the band saw.



3 ROUTING THE PARTS • Pattern routing the parts is easy using the templates. Nail the appropriate template to a roughed out part, using the index lines for reference. Begin routing with the bit cutting against the wood. When you come to a cloud lift, use a climb cut so you don't burn the rounded corner.

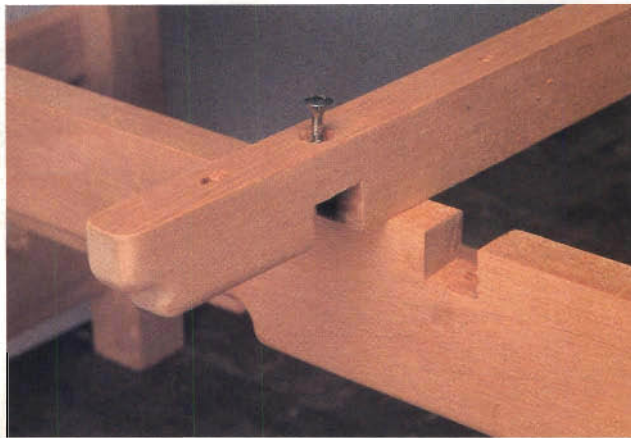
tern with the cross hairs on the parts. Drill $\frac{1}{4}$ " clearance holes in each hole and cut out the squares with a scroll saw. You can't quite cut all of the holes on the center slat but come close and clean up the rest with a chisel.

3 Routing the Parts • Mount a $\frac{3}{8}$ " pattern bit into a router table and set the depth of the bearing to run against the template while cutting the part.

4 Biscuits and Assembly • After routing the cloud lifts, cut all of the biscuit joints for the base and top. I used Porter-Cable's new biscuit joiner for this table because it comes with a 2" blade perfect for joining the base and top parts with smaller biscuits.

The easiest way to lay out the biscuit joints is to dry-clamp the end assembly together and mark the centers of the ends on the apron pieces and legs. The aprons have a $\frac{1}{4}$ " setback from the outside of the legs, so cut the biscuit slots on the apron assembly first. Then, using a $\frac{1}{4}$ " spacer, set up the biscuit joiner to cut the offset on the legs. Use #20 biscuits on the short aprons (C) and Porter-Cable face frame biscuits (or dowels) on the end dividers and up-rights (D and E). Before assembly, rout a $\frac{1}{4}$ " radius on the legs and the ends of the apron parts that contact the legs. Rout the rest of the assembly after gluing up. One last step before assembly is to drill screw pockets into the upper aprons for attaching the top. Glue up the end assembly.

After drying, mark the location of the base stretcher on each end assembly. Take the long aprons and base stretcher and dry clamp the entire base together. The base stretcher should be press fit between the end assemblies. Repeat the same process of cutting #20 biscuit slots on the long aprons and end assemblies. Dowel the base stretcher into each end assembly using two $\frac{3}{8}$ " dowels. After doweling the stretcher, lay out and scroll saw the profile on the ends of the top



4 NOTCHING THE STRETCHER • Lay out a $\frac{5}{8}$ "-deep by $\frac{3}{4}$ "-wide notch into the top stretcher and the base. The notch is $2\frac{3}{4}$ " in from the stretcher end and 8" in from the joint where the apron meets the leg. Notice the clearance holes drilled into the top edge of the base and stretcher.

WOOD WORDS (wood'wurds) n.

PIERCE CUT: Raising the table saw's blade through a part and lowering it when done. In solid lumber, this works only when making a rip cut. Man-made materials (such as MDF and plywood) can be ripped or crosscut.

CLIMB CUT: Slowly routing backwards from the cutting direction of a router bit. This will give a smoother cut in figured woods and when routing across end grain.

stretchers using the pattern in the PullOut Plans. Let the top stretchers into the base using half-lap joints according to the diagram. Then glue the entire base together and screw the stretchers into the top edge of the base.

Begin the top assembly by routing a $\frac{1}{4}$ " radius on the top long edge of all the slats. Using $\frac{1}{4}$ " spacers, clamp the slats together without glue. Dry clamp the ends in place and mark for biscuit joints. Cut the biscuit slots and glue this top sub-assembly together. When dry, place the long top frame pieces against the sub-assembly and mark the inside corner where the short frame meets the long frame. Rout a $\frac{1}{4}$ " radius on the inside edge of the long frame piece between the corner marks. With a rasp, finish the radius where it tapers on the ends. Mark and cut biscuit slots, then glue up the top.

After drying, cut a profile on each corner using the pattern for the top stretchers. Rout a $\frac{1}{4}$ " radius on the outside edge of the top.

After sanding, center the base on the underside of the top and attach it to the top using $1\frac{1}{2}$ " screws in the screw pockets and $1\frac{3}{4}$ " screws in the top stretchers. No finish is required. If you leave the table unfinished and outdoors, it will turn a beautiful silver color. **PW**

Build the Bench

You can purchase large-sized plans for the Greene & Greene Garden Bench by calling

800-289-0963. Ask for item #98007. The cost is \$9.95 for U.S. residents. Have your Visa or Mastercard ready.



Popular Woodworking

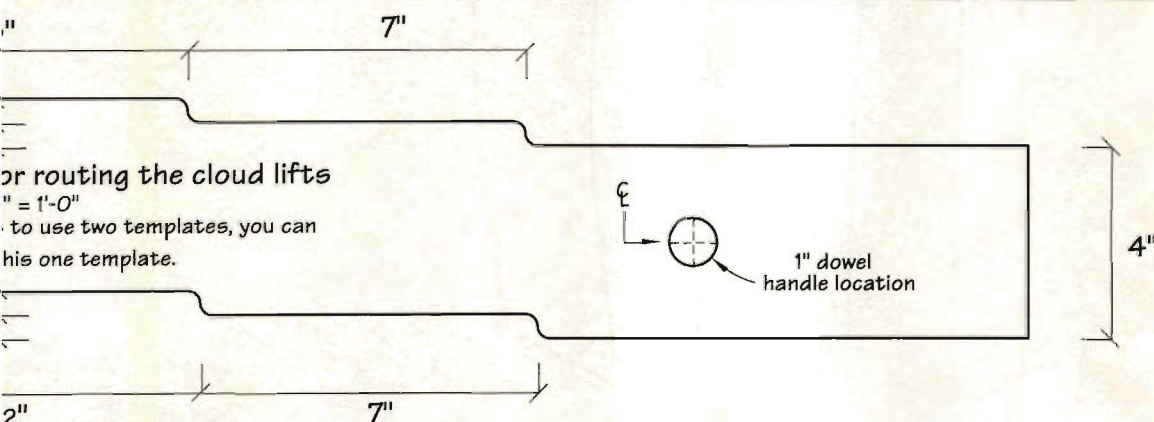
Carefully open
staples to remove
plans, then bend
staples closed again.

Supplemental drawings for projects in this issue

Project name	From page
Titanic Deck Chair	30
Greene and Greene Garden Table	34
Bauhaus Jewelry Box	45
Garden Windmill	58

These plans incorporate pages 37 to 44 of this magazine

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3/8"
1/4"
3/8"

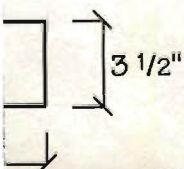
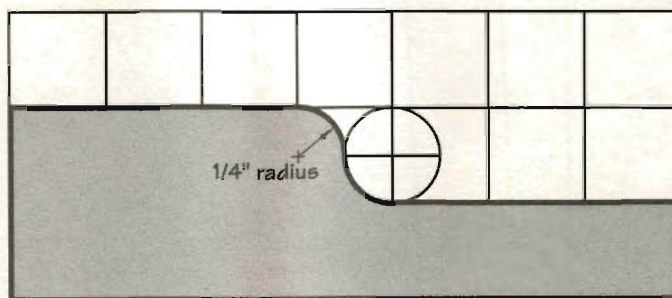


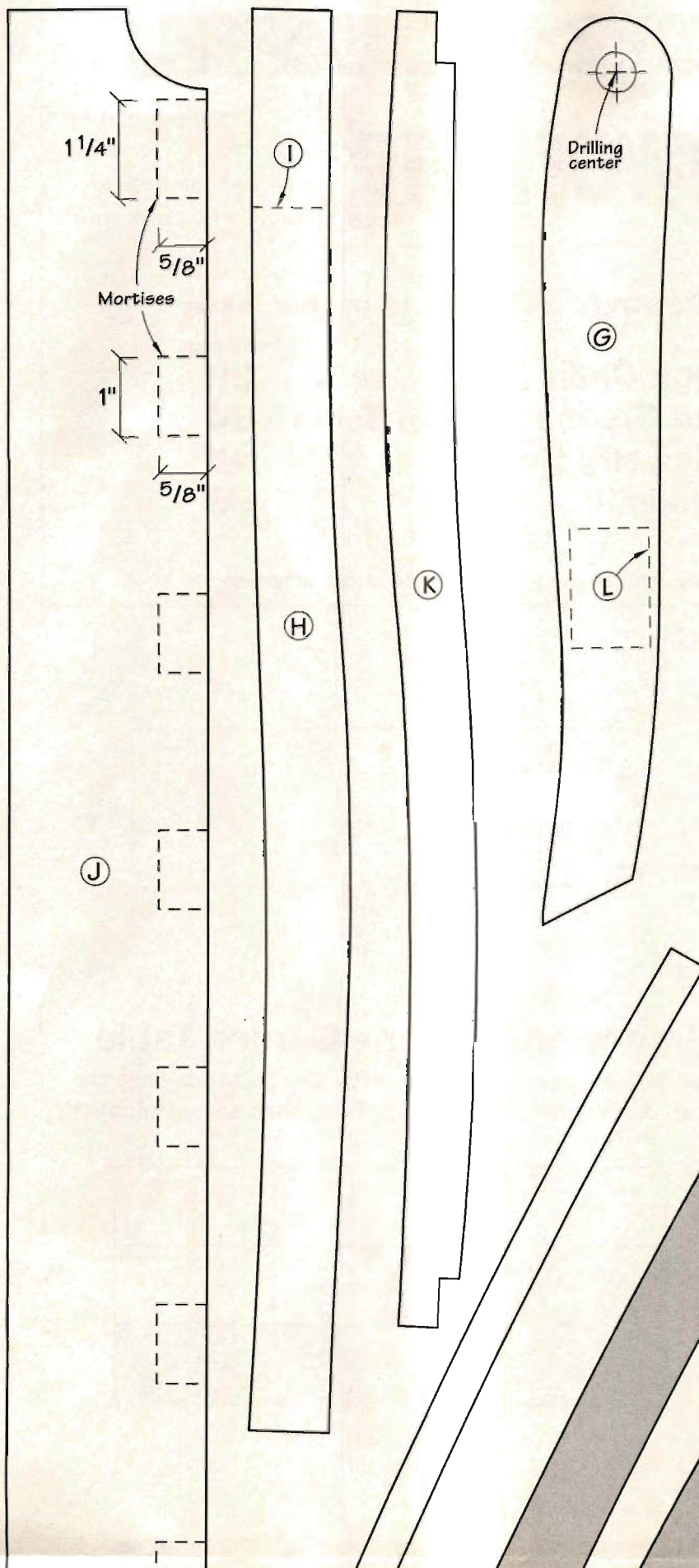
Make the back corner
at this joint.



Greene and Greene Garden Table

Full-size diagram of the cloud lifts. Use this to lay out the individual cloud lifts on the jig above. Each square equals 1".





Titanic's Deck

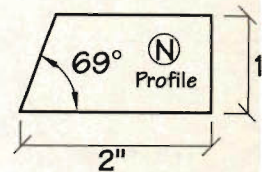
Half-scale diagrams of a

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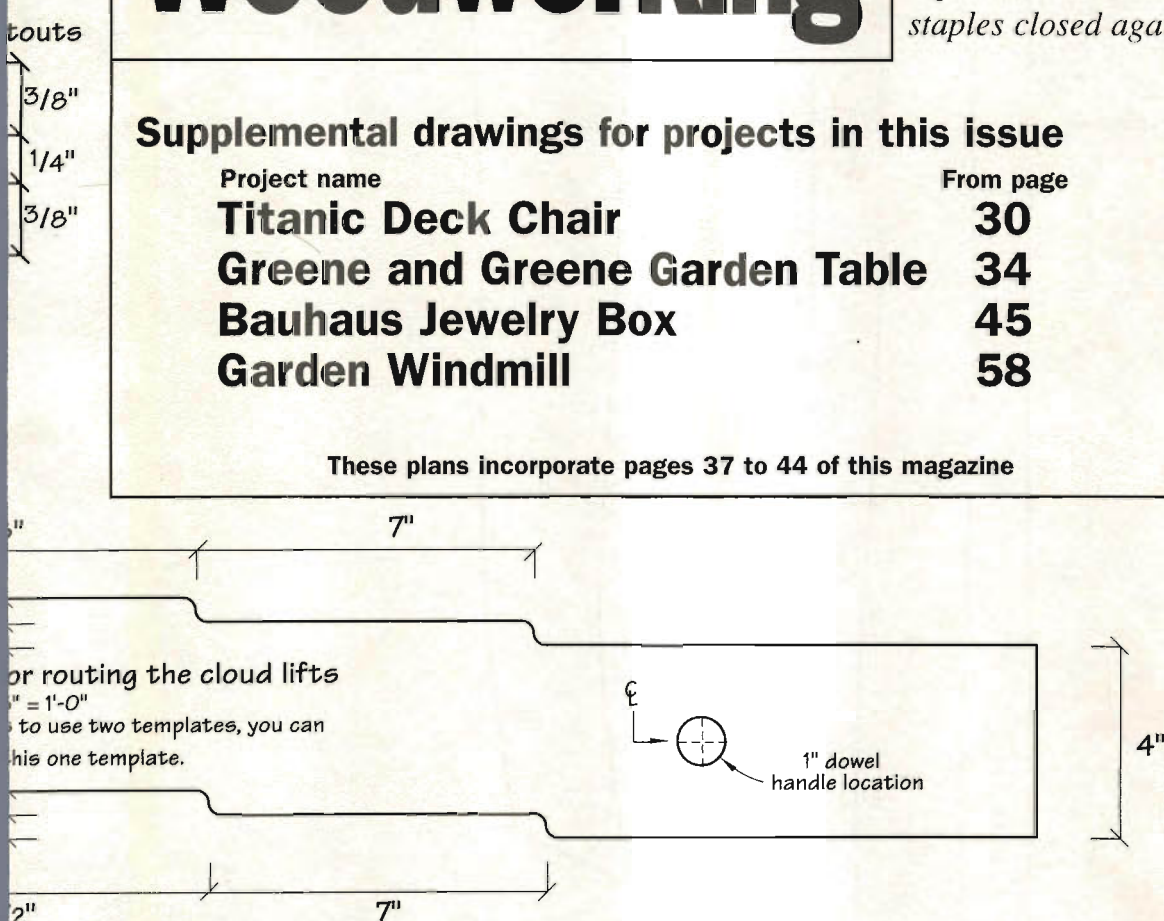
Popular Woodworking

Carefully open staples to remove plans, then bend staples closed again.

Supplemental drawings for projects in this issue

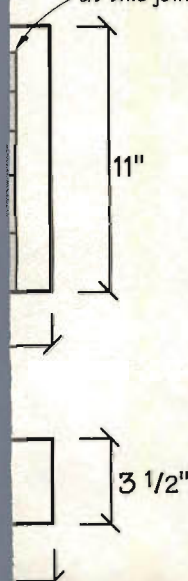
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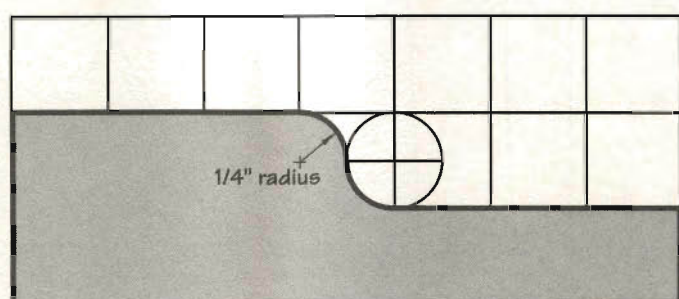
For routing the cloud lifts, use two templates, you can use this one template.

Make the back corner at this joint.



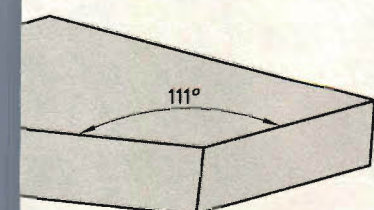
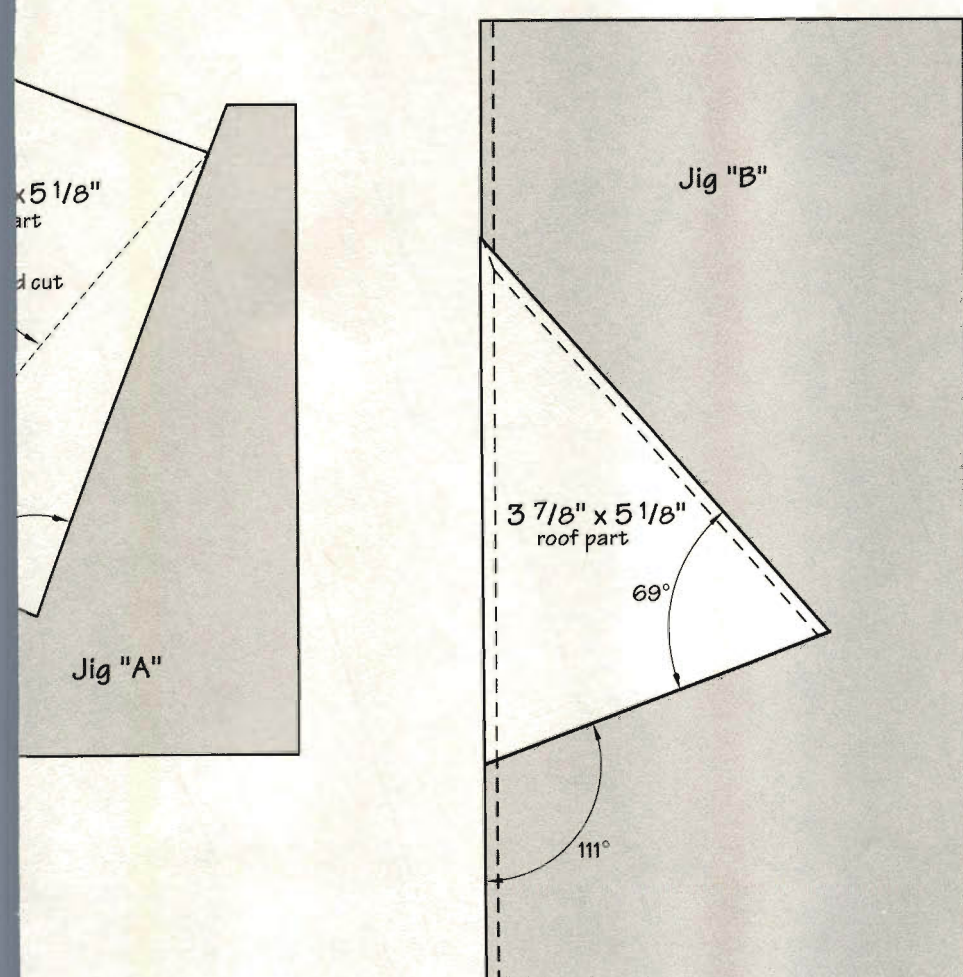
Greene and Greene Garden Table

Full-size diagram of the cloud lifts. Use this to lay out the individual cloud lifts on the jig above. Each square equals 1".

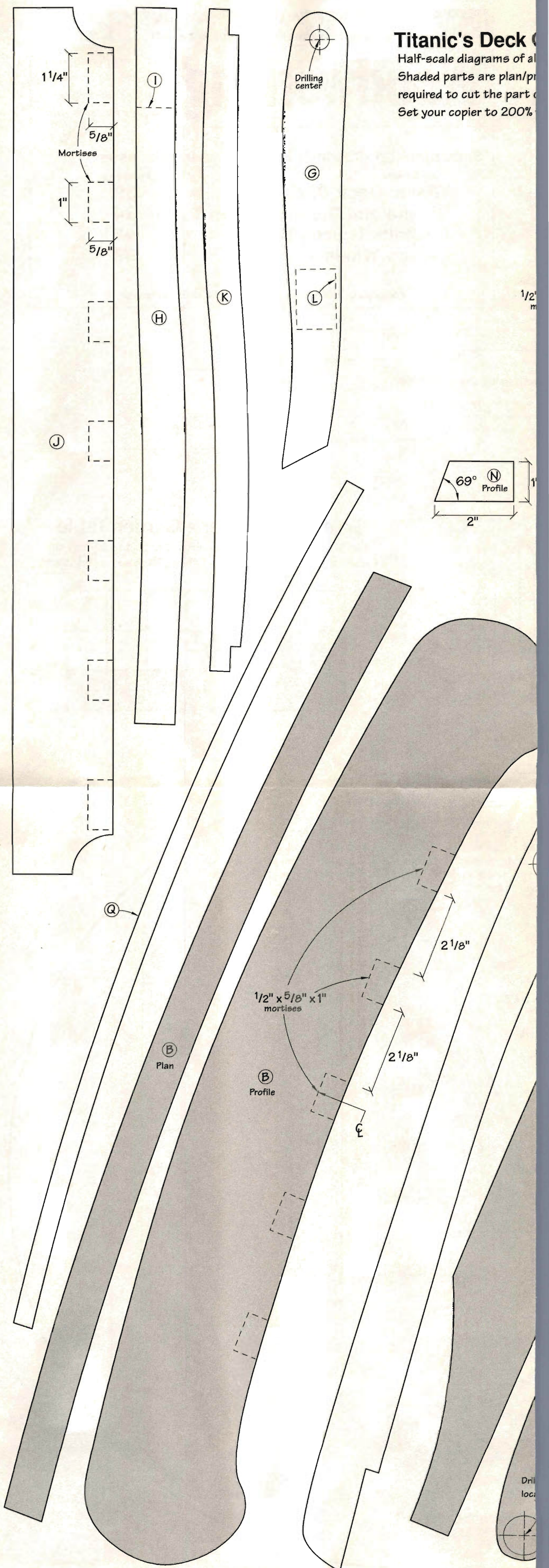


Garden Windmill

Half-scale diagrams of jigs used to cut roof parts. Set the table saw to 9° then use jig "A" for the first angle cut. Leave the angle setting and use jig "B" to finish the roof parts. The layout shown assumes a right-tilt blade with the fence on the right side of the blade. Reverse for left-tilt blades.

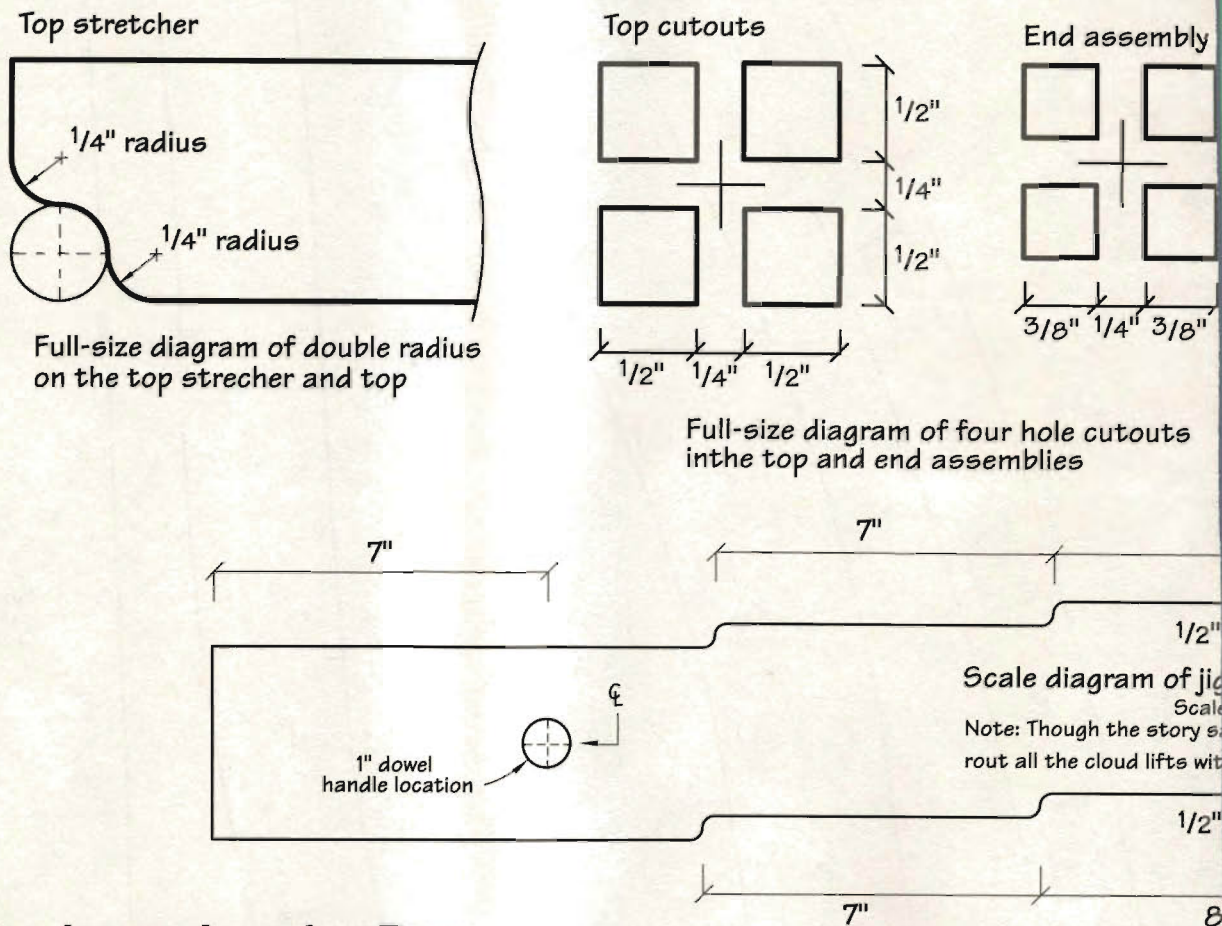


Half-scale diagrams of all
Shaded parts are plan/pro
required to cut the part o
Set your copier to 200%



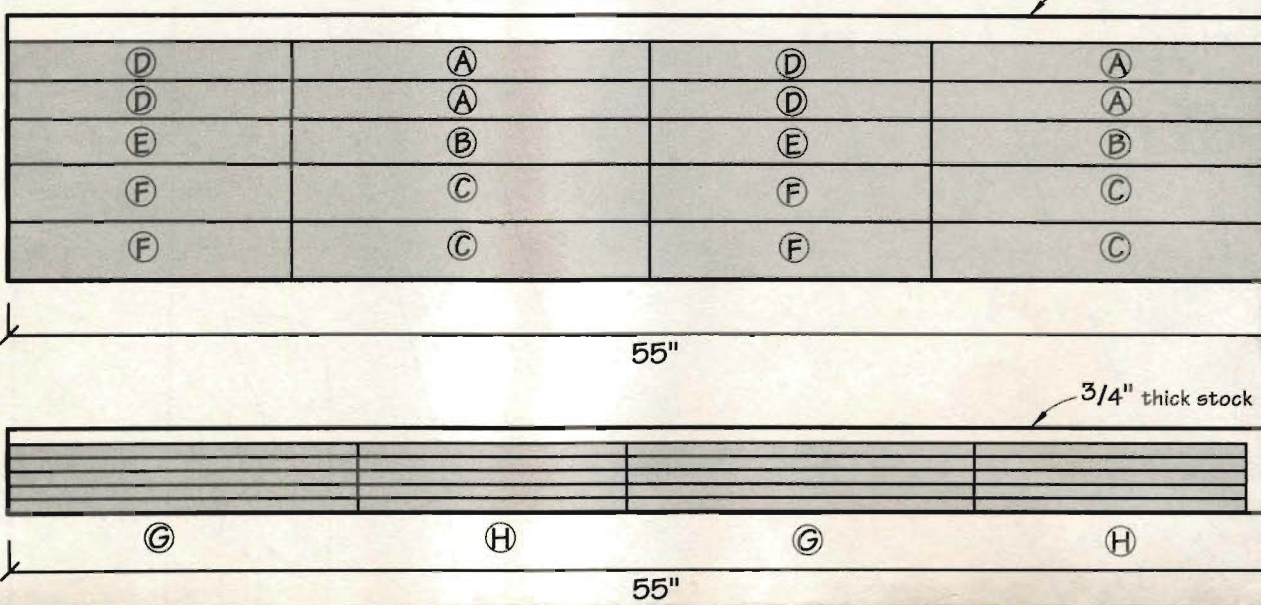
Greene and Greene Garden Table

Full-Size diagram of both four-hole cutouts, the double radius on the top stretcher and top, the layout for all of the cloud lifts on the table and a scale diagram of the jig used for routing the cloud lifts.



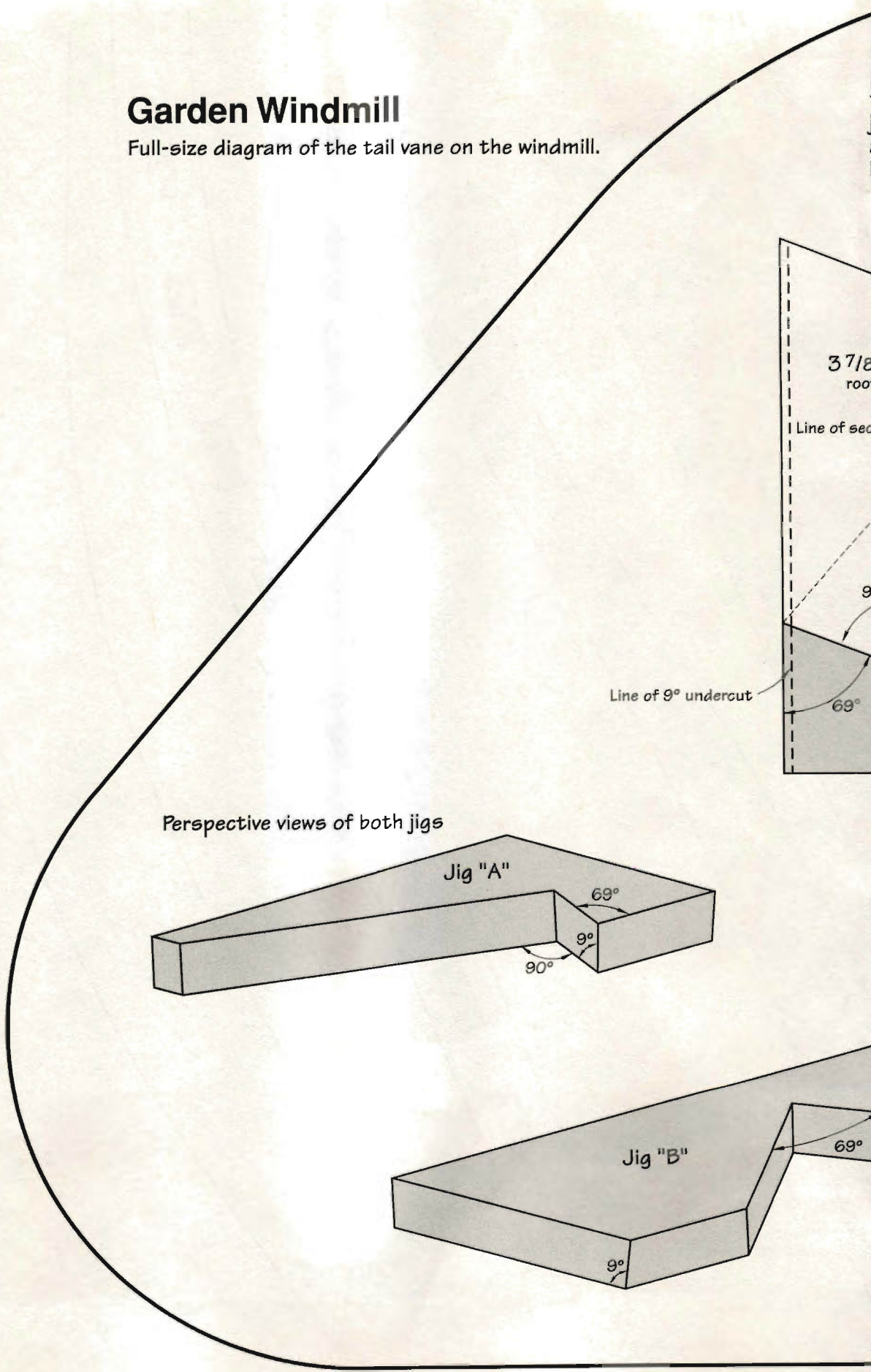
Bauhaus Jewelry Box

Scale diagram of cutting layout for case parts and dividers.
Scale: 1 1/2" = 1'-0"



Garden Windmill

Full-size diagram of the tail vane on the windmill.



Chair

curved parts.
les of both outlines
. Mortises are shaded.
full-size.

5/8" x 1"
pieces

Drilling location
E

Drilling location

A
Plan

A
Profile

Locations
for seat slats
"U". Mortises are
shaded.

C

S

D

Drilling location

F

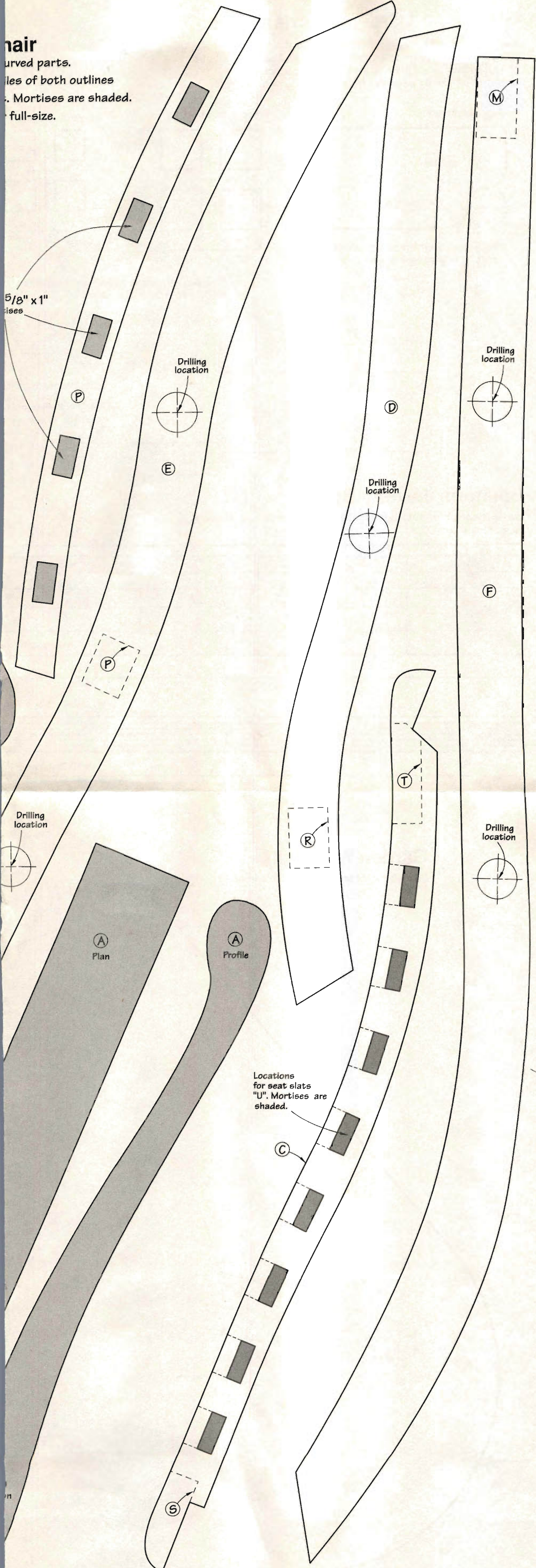
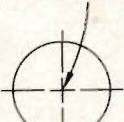
Drilling location

M

Drilling location

T

R





*This project looks
so much like a modern office
building, you half-expect
to find tiny executives
inside instead of jewelry.*

BAUHAUS Jewelry Box

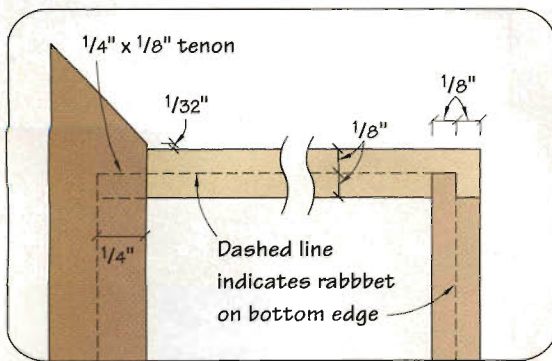
IF THE FAMOUS BAUHAUS ARCHITECT Ludwig Mies van der Rohe (1886-1969) had designed a jewelry box, I imagine it would look a lot like one of his modern office buildings: starkly utilitarian and well-proportioned. This jewelry box was built with his design principles in mind. Instead of glass and steel, however, I chose to use figured wood — cherry in particular, with a curly cherry veneer top.

Jim Stuard is associate editor for Popular Woodworking.

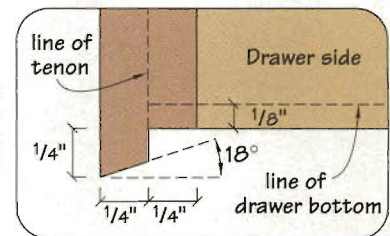
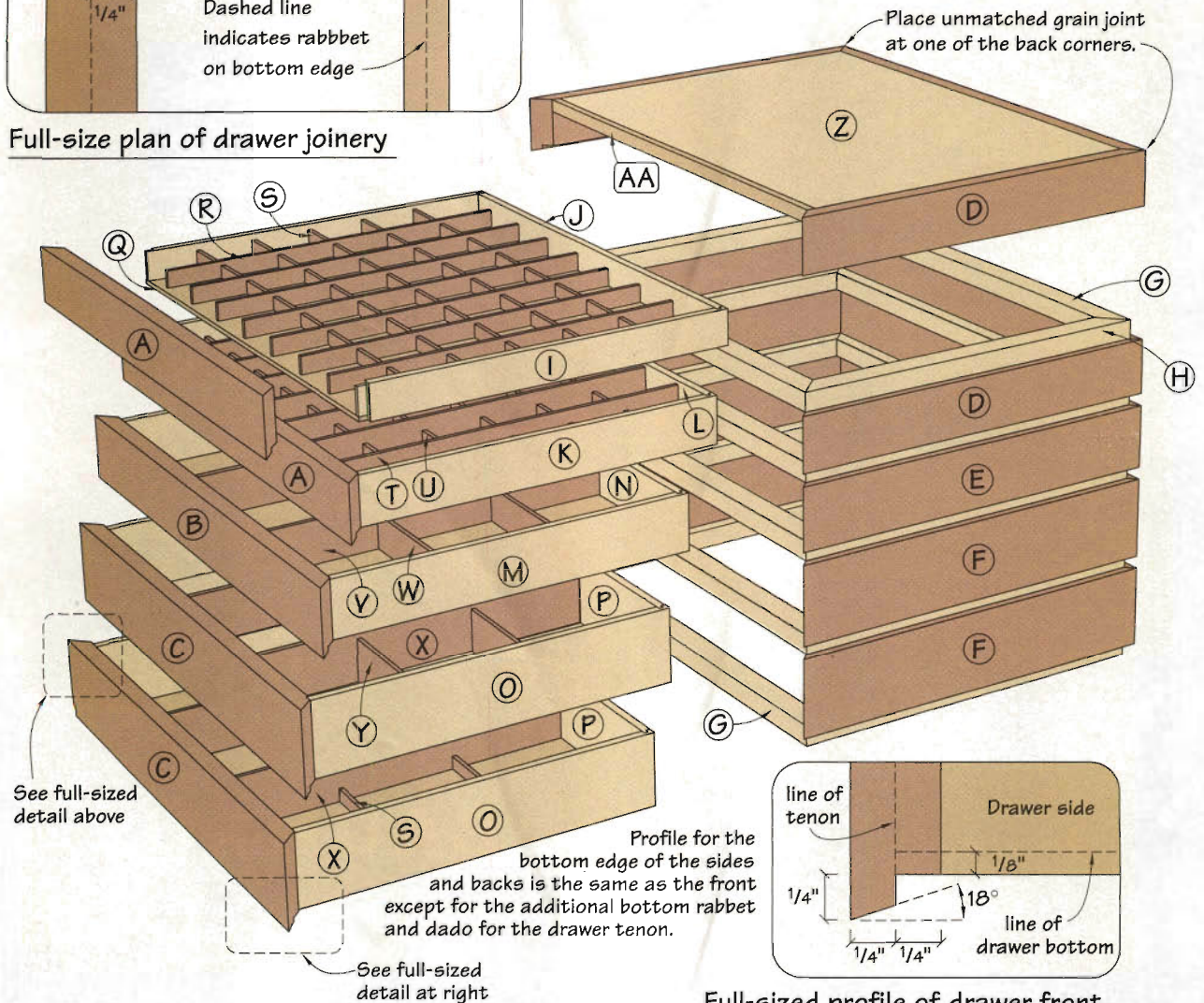
1 Big Box Made From Little Ones • The neat part of this jewelry box was not so much *how* it was made but *what* it was made from. I started with a single 1/2"-thick board about 11" x 60" for the sides. This ensures there will be a grain match on three corners of the box. The construction is simply a series of smaller boxes glued together to form one larger chest of drawers. The top is a curly cherry veneer and plywood panel glued into the top box.

Begin construction by planing down a single board to size,

DIAGRAMS



Full-size plan of drawer joinery

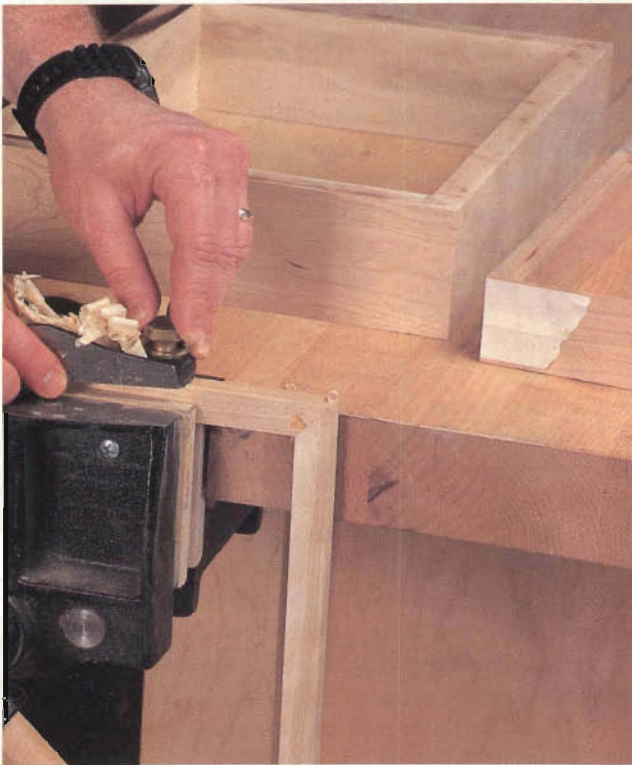


Full-sized profile of drawer front

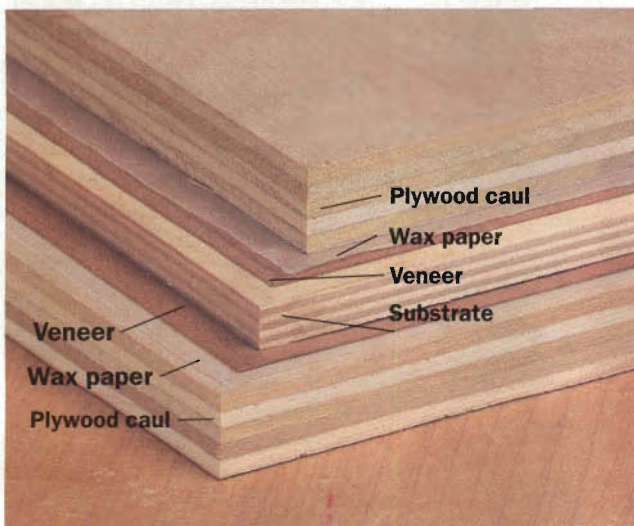
Schedule of Materials: Bauhaus jewelry box

No.	Ltr.	Item	Dimensions T W L	Material
4	A	Front & back	1/2" x 1 5/8" x 15"	Cherry
2	B	Front & back	1/2" x 1 7/8" x 15"	Cherry
4	C	Front & back	1/2" x 2 3/8" x 15"	Cherry
4	D	Ends	1/2" x 1 5/8" x 11 3/4"	Cherry
2	E	Ends	1/2" x 1 7/8" x 11 3/4"	Cherry
4	F	Ends	1/2" x 2 3/8" x 11 3/4"	Cherry
10	G	Case divdr. f&b	9/16" x 3/4" x 14 1/2"	Cherry
10	H	Case divdr. ends	9/16" x 3/4" x 11 1/4"	Cherry
2	I	Drawer sides	1/4" x 1" x 10 13/16"	Maple
1	J	Drawer back	1/4" x 1" x 13 11/16"	Maple
2	K	Drawer sides	1/4" x 1 3/8" x 10 13/16"	Maple
1	L	Drawer back	1/4" x 1 3/8" x 13 11/16"	Maple
2	M	Drawer sides	1/4" x 1 5/8" x 10 13/16"	Maple

No.	Ltr.	Item	Dimensions T W L	Material
1	N	Drawer back	1/4" x 1 5/8" x 13 11/16"	Maple
4	O	Drawer sides	1/4" x 2 1/8" x 10 13/16"	Maple
2	P	Drawer back	1/4" x 2 1/8" x 13 11/16"	Maple
5	Q	Drawer bottoms	1/8" x 10 11/16" x 13 11/16"	Masonite
7	R	Drawer dividers	1/8" x 1/2" x 10 5/16"	Maple
7	S	Drawer dividers	1/8" x 3/8" x 13 7/16"	Maple
7	T	Drawer dividers	1/8" x 1" x 10 5/16"	Maple
5	U	Drawer dividers	1/8" x 5/8" x 13 7/16"	Maple
2	V	Drawer dividers	1/8" x 1 1/4" x 10 5/16"	Maple
2	W	Drawer dividers	1/8" x 1" x 13 7/16"	Maple
4	X	Drawer dividers	1/8" x 1 1/2" x 10 5/16"	Maple
2	Y	Drawer dividers	1/8" x 1 1/4" x 13 7/16"	Maple
1	Z	Top	3/8" x 10 1/2" x 14"	Maple
1	AA	Top trim	1/4" x 3/8" x 14"	Maple



1 MITERS, TAPING AND SPLINES • Cut the five dividers from one four-sided box. Tape all of the drawer boxes together and fit the dividers with a block plane. It takes a little finessing to get the divider clamped in a vise, but this is the best way to fit the dividers into the rabbet in the sides.



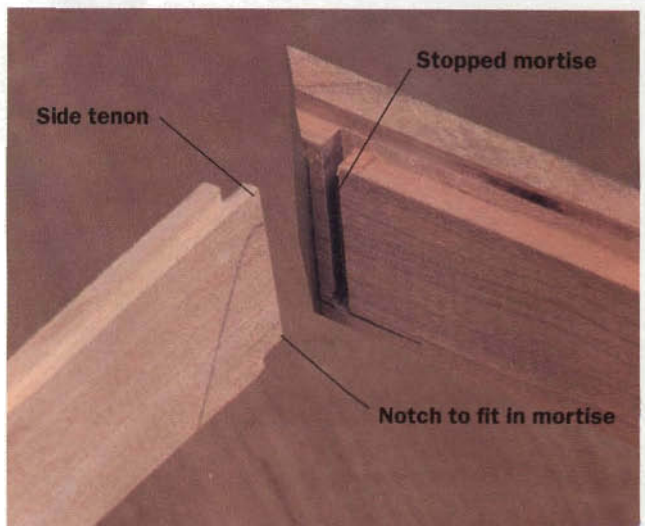
2 PRESSING VENEER • From bottom to top, start with a plywood base plate, or caul, then wax paper to prevent adhesion to the plate. Then comes the veneer, and finally the substrate. In this case, Baltic Birch. Repeat this order on the other side. Apply glue to the substrate and clamp it all up.

then rip the side widths of the individual layers, keeping track of their orientation. Next cut the profile on the bottom edge of each side blank as shown on the diagram, making the bevel cut first, then the rabbet. Use a rip blade to leave a square-bottomed cut in the rabbet.

Now you can separate each layer into the sides, front and back pieces. It takes four different setups to make all of the parts. These cuts can be made on a table saw or miter saw. Use the cutting guide in the Pull-Out™ Plans to organize the order of the cuts. When finished, the two outside ends of each original blank (which form the mismatched grain joint) will be at the back of the finished box. Mark the parts and their order.

The Ryobi mini-biscuit joiner came in handy at this point. Cut #3 biscuit slots in the two back corners of each layer. Tape the individual units together and take a general measurement of the dimensions inside the rabbet on each box. Now make the dividers that go between each drawer. I made these divider boxes by first building one box from a piece of cherry that's $\frac{3}{4}$ " x $3\frac{1}{2}$ " x 55" and then ripping it into five $\frac{9}{16}$ " dividers. Make this large box with splined miter joints. Make sure the grain direction on the spline is the same as the grain direction on the box. Rip the five dividers from this box and fit them into the rabbets in the bottom of the drawer boxes.

2 Top it Off • Cut out the top according to the Schedule of Materials. Lay up a veneer sandwich with plywood, veneer, wax paper and backer panels for clamping (see photo). After the panel is dry, trim the excess veneer and glue a $\frac{1}{4}$ " cherry strip to the front edge of the top.



3 MORTISE + TENON = STRONG JOINT • The drawers go together with a mortise and tenon. Begin routing the mortise by laying out the outside of where the drawer side will hit the front. Mark $\frac{1}{4}$ " from this mark and that is where the mortise will go. Mark the height of the tenon on the front and, using a square as a guide, rout a $\frac{1}{4}$ "-deep mortise into the front. Make the $\frac{1}{8}$ " x $\frac{1}{4}$ " rabbet into the inside bottom edge on a router table.

JEWELRY BOX

When the panel is glued in place in the top box, the front corners of the panel should meet at the inside miter of the sides. Trim the panel to fit. Then, using biscuits, glue the panel to the back and side pieces, also gluing the frame divider into the bottom rabbet. Checking for square is very important here. Continue to glue the other boxes together with their individual dividers. Tape in the drawer fronts for proper spacing here. The divider on the bottom box forms the base of the finished case. When dry, biscuit and glue the five layers of boxes together to form the finished case.

3 Airtight Drawers • For the drawers, it's best to first cut long strips to the width and thickness of the drawer pieces. Next cut the $\frac{1}{8}$ " x $\frac{1}{8}$ " rabbet in the bottom edge of each drawer blank. Cross cut the drawer parts to length according to the Schedule of Materials, then cut a $\frac{1}{8}$ " x $\frac{1}{8}$ " rabbet on the front end of each drawer side and on both ends of the drawer backs, leaving a $\frac{1}{8}$ " x $\frac{1}{4}$ " long tenon. On each side piece, cut a $\frac{1}{8}$ " notch out of the top of each tenon to allow a shoulder to hide the mortise that follows. Cut corresponding dados into the back ends of the drawer sides to capture the back tenons.

Routing the mortises in the drawer fronts is a little tricky. Set up a router with a $\frac{1}{8}$ " straight bit set for a $\frac{1}{4}$ " depth. Clamp a straight edge perpendicular to the drawer front as a

guide in routing the stopped mortises. Locate the mortises so the drawer sides will be $\frac{1}{32}$ " in from the inside edge of the end miters, so the drawers will be easier to fit. Rout the dados on each end of each drawer front, stopping $\frac{1}{8}$ " from the top edge on the fronts. When you're happy with the fit of each drawer, glue them together. Traditional clamps proved cumbersome on this project. Just use plain masking tape to pull the joints together. Generate pressure on the joint by securing the tape to one part and then pulling it across the joint and sticking it to the other side. If everything works well, the drawers shouldn't require much fitting when dry.

The next step is to fit the drawer bottoms into the rabbets in the drawers. When fit, glue velvet to the bottoms, and trim the edges flush. Next, place the bottoms back in the drawers and, using a sharp knife, trim the velvet where it meets the drawer side. Take the bottoms out and peel off the excess velvet. Glue the bottoms back in after finishing.

The internal dividers are joined using a cross-lap joint and placed in the drawer after it's finished. Friction holds them in place. When you're happy with the fit of all the parts, sand to 220 grit and put three coats of clear finish on the piece. Rub the finish out using an extra fine synthetic steel wool and steel wool wax. Rub with the grain and be careful not to rub through the finish at the edges and corners. **PW**

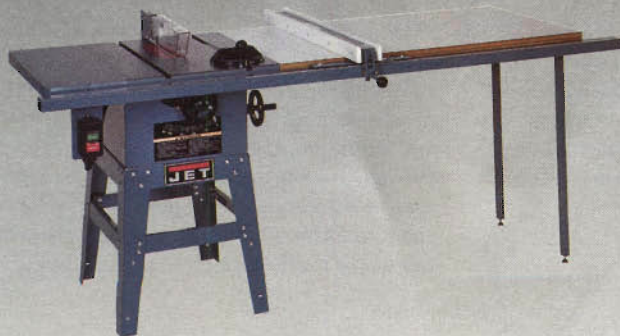
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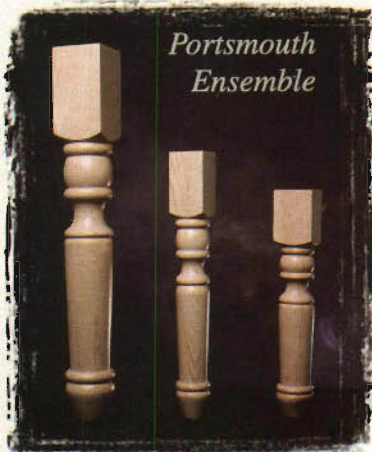
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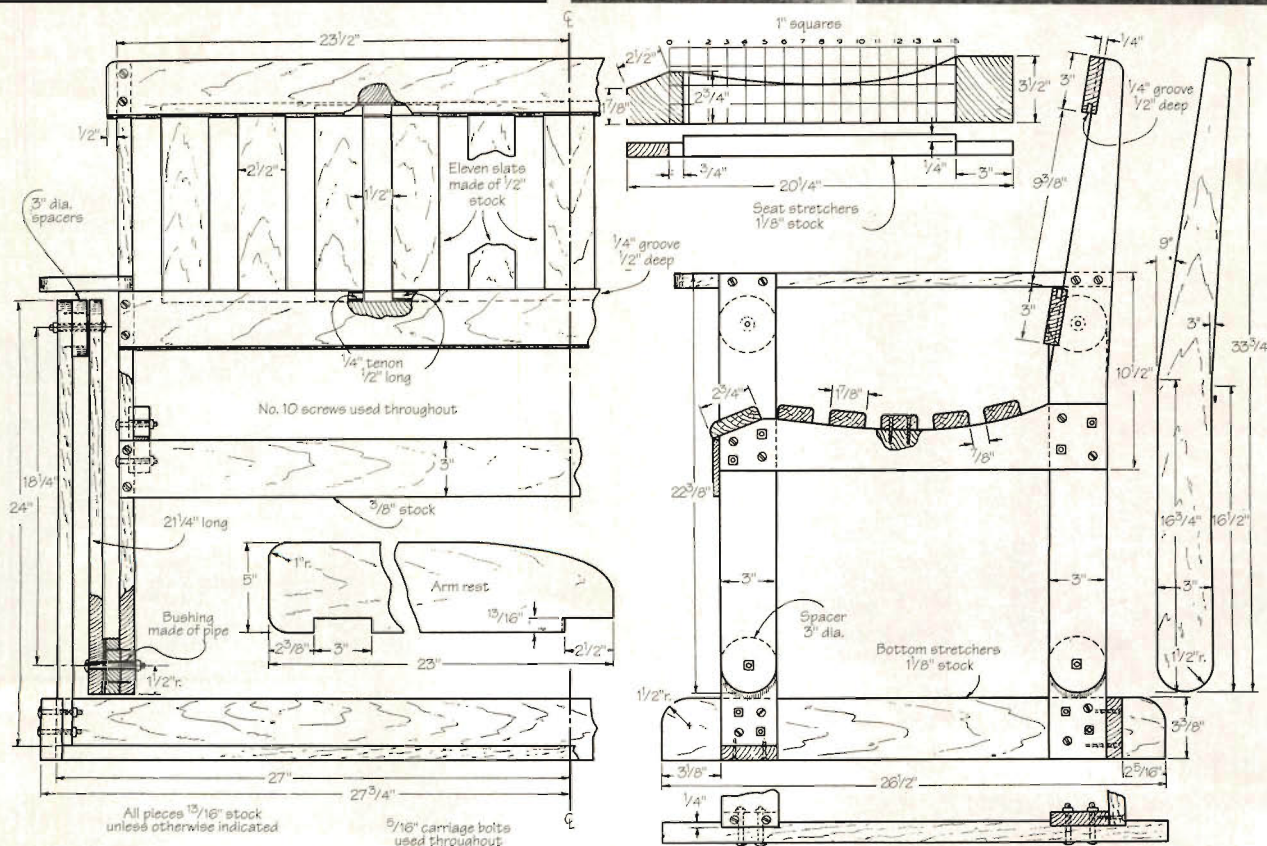
③

The seat itself is built up as shown in the drawing and the unit is assembled. The drawing shows all the necessary construction details for building. The supporting frame and the main seat frame are fastened together with carriage bolts, the remainder of the assembly being made with flat-head wood screws. The whole unit should be finished with two coats of boiled linseed oil followed by several coats of outdoor paint. The finished product will be a welcome addition to your porch or lawn. **PW**

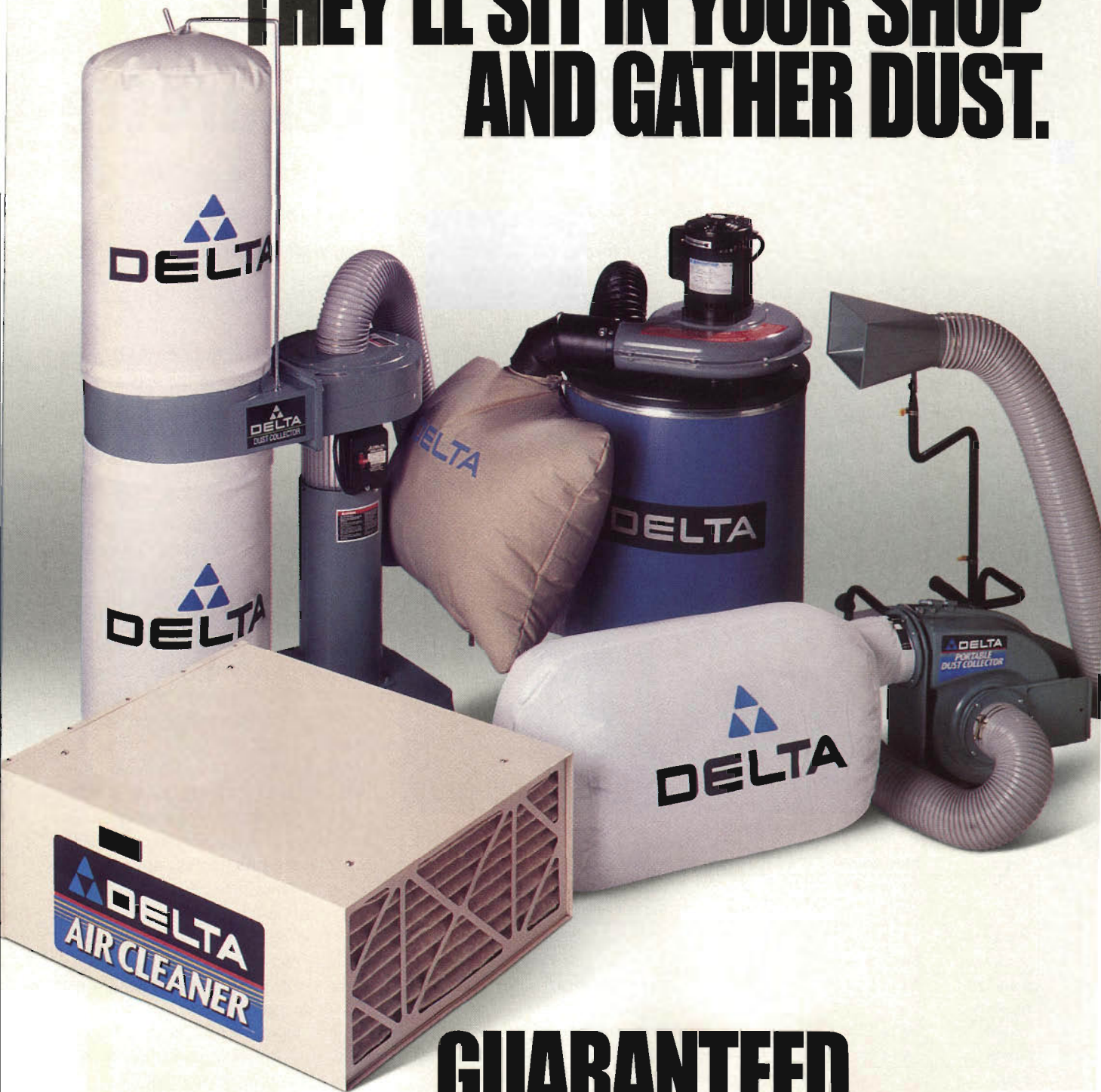


Vol.15,
Issue 5
price: 10 cents

A nostalgic look back at the plans published by Delta Machinery after World War II.



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Arts & Crafts Cellarette

A turn-of-the-century place for your spirits or (for teetotalers) an eye-catching small desk.

A LOT OF THE LITERATURE about the Arts & Crafts movement gives the impression that its followers were serious folks. Some of the devotees even lived in communes that were dedicated to philosophy, the arts and producing beautiful objects.

But that doesn't mean our turn-of-the-century ancestors didn't know how to party. Almost all of the major manufacturers of Arts & Crafts furniture featured cellarettes (also called liquor cabinets) in their catalogs. Some companies, such as the Shop of the Crafters in Cincinnati, Ohio, even built their reputation on selling a wide variety of cellarettes.

Now I know that not everybody drinks. In fact, I drink hard liquor so rarely that this project seemed impractical at first for my home (but my wife insisted). So to make this project appropriate for every home, I made the dimensions such that it also will work perfectly as a drop-front desk. If you build it as a desk, my only recommendation would be to make it more stable by either making the base 2" deeper at the bottom or attaching the desk to your wall. The drop front is sturdy as is; but these extra measures will ensure your desk never topples.

Construction is straightforward. The two shelves are mortised into the sides. The rails are biscuitied into the sides. The top is screwed to the base with cleats. And the drop front is attached with hinges. Begin by cutting all your pieces to size.

Christopher Schwarz is managing editor of Popular Woodworking.

Schedule of Materials: Arts & Crafts cellarette

Base parts

No.	Item	Dimensions T W L	Material	Notes
2	Sides	3/4" x 12" x 47"	Oak	tapers to 10" at top
1	Top	3/4" x 11 1/2" x 40"	Oak	3/8" x 1" chamfer on bottom
1	Middle shelf	3/4" x 9" x 30 3/4"	Oak	1/2" x 3/8" tenon both ends
1	Book shelf	3/4" x 8" x 30 3/4"	Oak	1/2" x 3/8" tenon both ends
1	Book rail	3/4" x 2" x 30"	Oak	biscuitied into sides
2	Top rails	3/4" x 2" x 30"	Oak	biscuitied into sides
4	Corbels	3/4" x 1 3/4" x 6"	Oak	glued to sides
4	Cleats	3/4" x 3/4" x 6"	Oak	screwed to sides and top
1	Back	1/4" x 17 1/2" x 31"	Oak Ply	in 1/4" x 1/2" rabbet in back

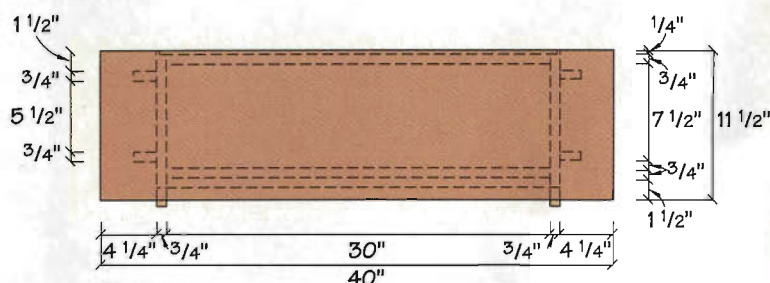
Drop front parts

2	Stiles	3/4" x 3 1/2" x 17"	Oak	1/4" x 3/4" groove inside
1	Top rail	3/4" x 5" x 24 1/2"	Oak	groove bottom • 1/4" x 3/4" tenons on ends
1	Bottom rail	3/4" x 2" x 24 1/2"	Oak	groove top • 1/4" x 3/4" tenons on ends
2	Interior stiles	3/4" x 3 1/4" x 11 1/2"	Oak	groove sides • 1/4" x 3/4" tenons on ends
3	Panels	1/2" x 6 1/2" x 11"	Oak	1/4" x 1/2" rabbet on back

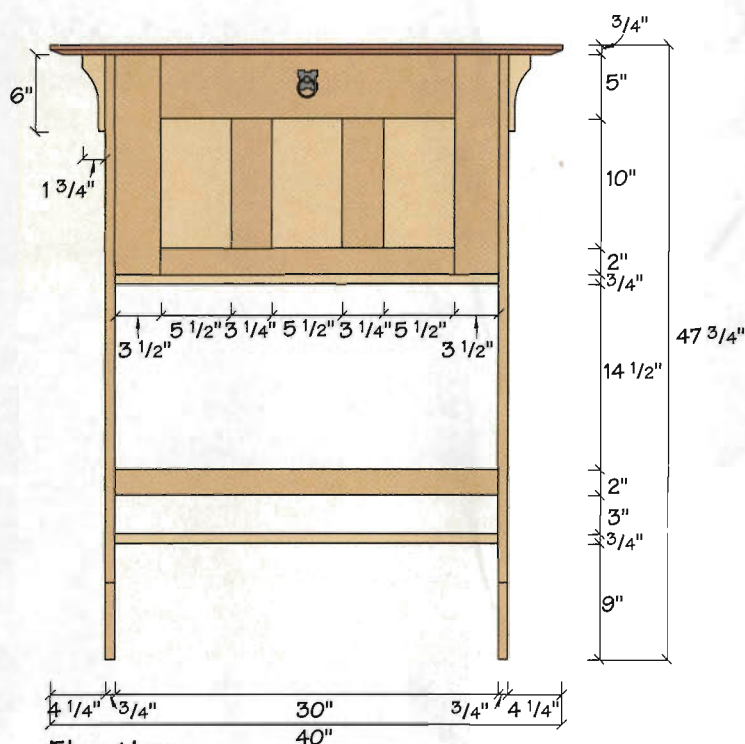
Hardware

2	Hinges	Paxton Hardware 410-592-8505 • item #4100 • call for price
1	Pull	Horton Brasses 860-635-4400 • item #MS-13 • call for price
2	Chains	Lee Valley Tools 800-871-8158 • item #00F05.01 • price \$4.75 each

Corbel
locations



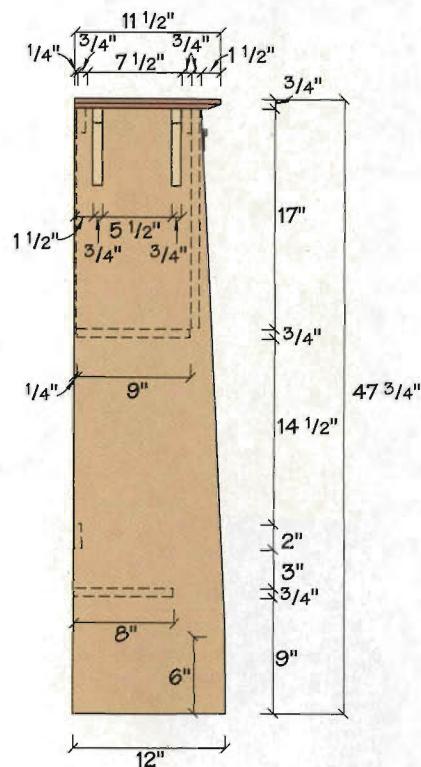
Plan



Elevation

Aging your hardware with 'gun blue'

Steel hardware can be easily aged by dipping it in gun blue for a minute or two. I've also found that brass hardware can be aged using this chemical. First remove the lacquer from the hardware with lacquer thinner, sanding or both. Dip it in gun blue (available at most gun stores), remove it when black and then coat the hardware with lacquer.



Profile

Lay out the locations of the shelves and rails on the sides according to the diagram. Cut the $\frac{3}{8}$ "-deep by $\frac{1}{2}$ "-wide mortises for the middle shelf and the book shelf. Then cut the tenons on the shelves to fit.

Cut the taper on the front of the sides. The taper begins 6" up from the bottom and ends where the top is 10" wide. Sand all the base parts.

Cut slots for the biscuits in the rails and sides. Now glue up the base and clamp. When dry, use a router and a rabbeting bit to cut the $\frac{1}{4}$ "-deep x $\frac{1}{2}$ " rabbet in the back of the sides to hold the back. The top back rail and the middle shelf also hold the back in place. Cut the back to fit. Cut

the corbels to size and attach with glue.

Build the drop front. Cut a $\frac{1}{4}$ "-wide x $\frac{3}{4}$ " groove on the inside edges of the rails and exterior stiles. Cut the same groove on both long edges of the two interior stiles. Then cut the $\frac{1}{4}$ " x $\frac{3}{4}$ " tenons on the ends of the two rails and on the top and bottom of the two interior stiles. Now cut the panels to size and cut a $\frac{1}{4}$ " x $\frac{1}{2}$ "-wide rabbet on the back of the panels. Apply glue to the tenons (not the panels), clamp and allow to dry.

Mortise the hinges into the middle shelf and the drop front. Attach the chains to the sides and the drop front. Add magnets, magnetic catches or even a lock to

hold the drop front in place. Center the pull on the top rail and attach it.

Cut the top to size. Cut a $\frac{3}{8}$ " x 1" chamfer on the underside of the sides and front of the top using your table saw. Drill clearance holes in the cleats. Attach the four cleats to the sides and rails, then screw the base to the top through these cleats.

Disassemble and sand. I used a warm brown glaze and two coats of lacquer for the finish. I aged the brass hardware by soaking the parts in gun blue for 30 seconds. Let the metal parts dry and then give them a coat of lacquer. Attach the drop front and top to the base. Nail the back into place. Cheers. **PW**

Here Comes the Rain

This easy-to-make gift uses some crazy ingredients (cat litter!) to make a soothing sound.



RAINMAKERS, or rainsticks, are decorative, easy-to-make instruments that will, with a turn of the wrist, create the sound of falling rain.

I've found that adults and children are fascinated with the varied sounds rainmakers produce, so one would be an unusual and welcome gift for anyone you know, and even more appreciated because you built it yourself.

Tony Nester lives in Flagstaff, Arizona. This article appeared originally in BackHome magazine.

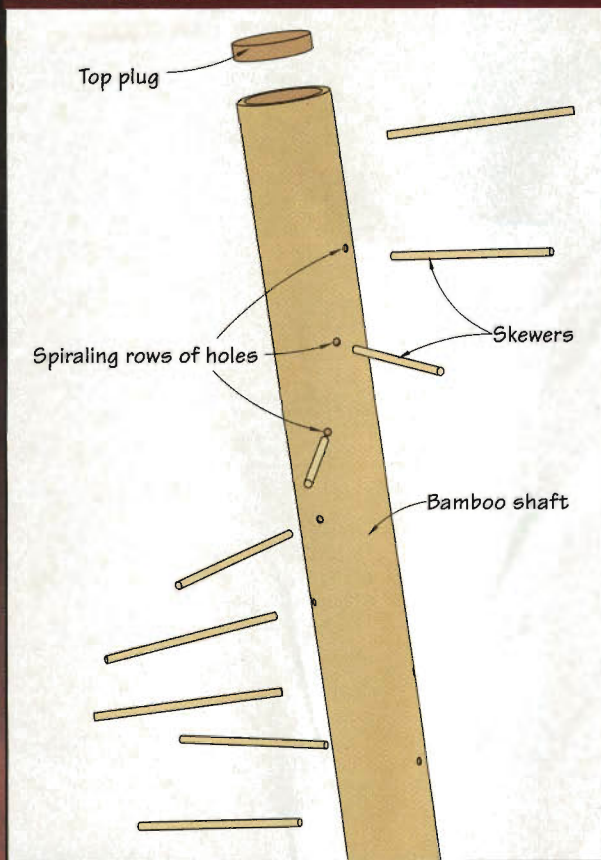
In Mexico and South America, rainmakers traditionally were made from hollow cactus or agave stems filled with seeds, and were used in ceremonies and village celebrations, often accompanying drumming and singing. I make mine out of bamboo, and now that I've experimented with several dozen of them, I feel I've come up with the easiest way to construct a personalized rainmaker in just a few hours.

To make one, you'll need a handsaw or a hacksaw, a drill with a long bit, a half-rounded file, some wood glue, fine sandpaper, a bit of scrap wood and stain

or other finish. You'll also need to buy wooden shish kebab skewers and bamboo. You'll probably find the grains used as filler in the kitchen cupboard.

The bamboo you are looking for should range from one to three feet in length and have as wide a diameter as possible; two to three inches is best. I usually find mine in a garden supply store; they're actually four-foot-long posts (I cut them down) with an oil-burning canister attached to the top and sell for \$1.99 (Tiki torches). Try to find a piece with as few segments as possible,

DIAGRAMS



The sound of rain is made by the filler passing through a latticework of the wooden skewers. To accomplish this, drill two spiraling rows of holes in the bamboo from top to bottom. Use a drill bit the same size as the diameter of the skewers, as you want a tight fit. Start the two first holes at the top directly opposite each other, then spiral the rest of the holes down the tube, spaced about 1" apart.

Now, insert the skewers by dabbing a little wood glue on one end of each skewer and pushing that end firmly through a hole until it reaches the inside of the opposite wall. When every hole is filled with a skewer your bamboo shaft will look like a tubular porcupine! But don't worry; you'll trim away the protruding ends after the glue has dried.

While the glue dries, cut out two wood plugs to seal off both ends of the bamboo. A $\frac{1}{4}$ "-to $\frac{1}{2}$ "-thick piece of scrap wood works well. Simply trace the outline of each bamboo end on a piece of paper, reduce the outline by the thickness of the bamboo, transfer the pattern to the wood, and cut out the plugs. Once you have a snug fit for each, glue only the bottom one in place. (If your plug does not fit exactly, you can fill in the

gaps using veneer strips or fine sawdust.)

After the glue on the skewers and the bottom plug is dry, gently cut off the protruding ends of the skewers. Then file and sand the stubs until flush.

You can leave the exterior of the bamboo as is, but if you want a finish, you need to sand any rough spots and smooth the entire surface with 220 grit sandpaper. Then apply a few coats of walnut or oak stain, enamel paint, varnish or simply oil. Be sure to do this before adding the filling, as most of the finishes will have a tendency to saturate the bamboo and would be absorbed by the filling inside, forming it into clumps and ruining any production of sound.

Your final task is to select the filler material and begin the process of "tuning" your rainmaker. Filler can be small-grained items such as rice, millet, hard corn kernels, dried peas, glass beads, coarse sand with tiny pebbles, or even cat litter. Any of these will work well by itself, but the best-sounding rainmakers I have are made from a combination. I particularly like the sound obtained using two-thirds millet and one-third dried corn kernels. How much material you use altogether will have to be determined by trial and error, but start out with enough to fill roughly one-fifth of the bamboo tube. Pour in whatever you choose, cover the open end with a piece of cloth secured with a rubber band, and start tipping the rainmaker from end to end, over and over, changing the contents until you arrive at the sound you prefer. You can control the volume and duration of the sound by tilting the rainmaker at different angles.

This part of the process usually takes me the longest as I search for just the right acoustic balance. When you are satisfied, glue the remaining plug in place, and set the rainmaker in an upright position until the glue dries. To ensure the longevity of the filler material and prevent it from clumping, rainmakers should be stored in a dry place.

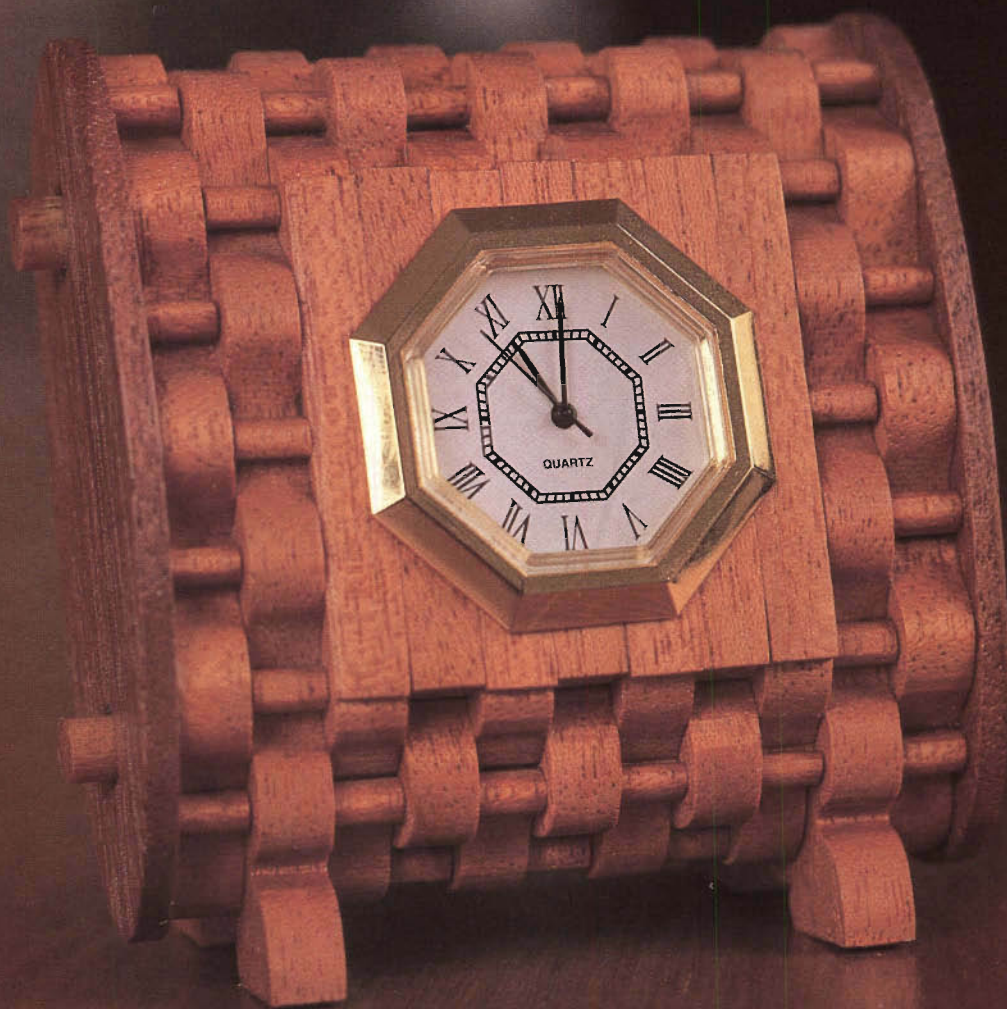
Like many handcrafted items, each rainmaker is unique and no two sound alike. I'll bet once you've made one, you'll want to keep it for yourself and go on to make many more for friends and family. You can even promote these instruments as stress reducers, as the soothing sounds keep the user going back time after time to listen to the changing patterns. **PW**

as the joints form an obstruction within the bamboo tube and must be drilled out. Therefore, the more joints there are, the more preparation there will be.

Cut the bamboo to the desired length using a saw with a fine-toothed blade to avoid splintering. Next, with the long bit, drill out the joint material to hollow out the bamboo. (I've also heard of dropping a hot coal down through the tube to burn clear through.) Then, because the filler should be able to flow freely within the length of the bamboo, file the interior joints until they are smooth.

Woven Clock

*This looks almost impossible to make,
but it's actually child's play with a scrollsaw.*



ONE DAY I WAS THINKING about how popular clocks and baskets have become in the last few years, and it gave me an idea. Why not combine both? This little shelf clock does exactly that. It's a clock with a "basket weave" effect. You will really fool everyone who sees your clock — they will swear you have woven it and will never believe when you

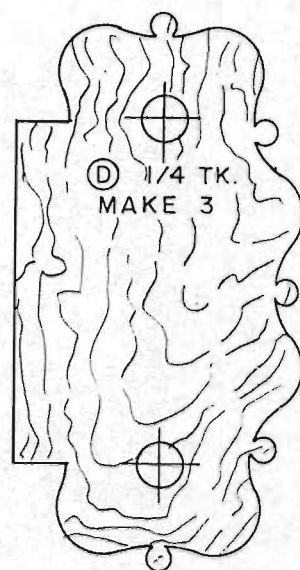
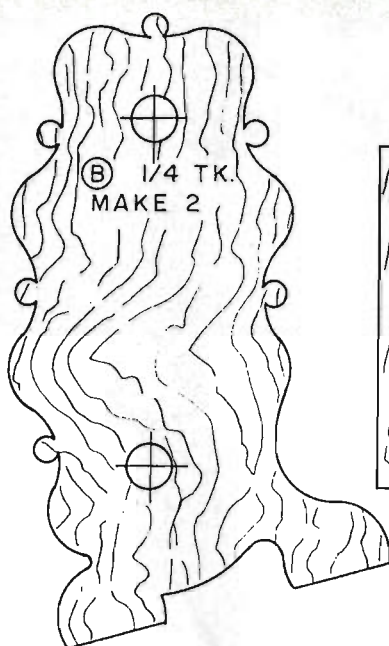
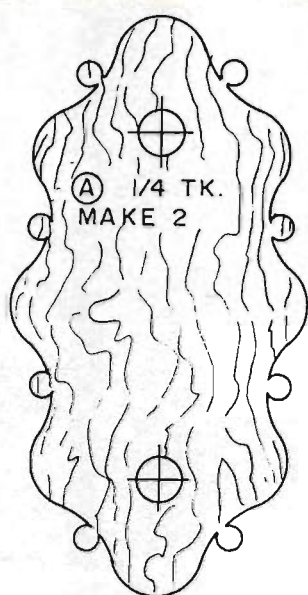
John Nelson is the author of countless books on scrollsaw designs. If you like this basket-weave project and would like to purchase more plans like it, write to Nelson Designs, P.O. Box 422, Dublin NH, 03444-0422.

tell them you cut it with a scrollsaw.

First make copies of the full-size patterns. Because this project doesn't use much material, chose an interesting hardwood. You might even consider using a light-colored wood for the $\frac{1}{4}$ "-thick center pieces and darker wood for the two $\frac{1}{8}$ "-thick ends. Sand all your material before you begin.

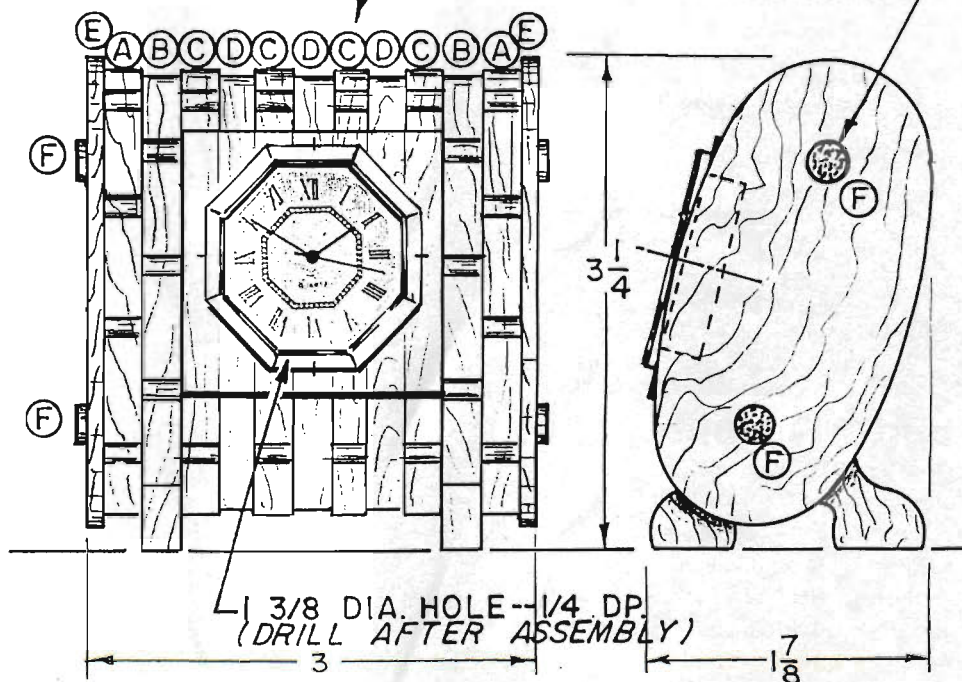
Attach the patterns to your wood using either rubber cement or a spray adhesive (both can be found at a local office supply store). Be sure to apply the adhesive to the pattern and not the wood. Because you've got to cut several pieces from each pattern, you might want to consider "stack cutting" them.

DIAGRAMS



(G) OCTAGON INSERT
(1 7/16 SIZE)

(F) 1/4 DIA. X 3 1/4 LG.
2 REQ'D.



Clock Inserts

For a catalog containing many types of clock inserts that will fit the 1 3/8" hole, call Klockit at 800-556-2548 or visit the company on the web at www.klockit.com

skip-tooth blade. Sand the top and bottom surfaces to remove any burrs left by the blade. Take care not to round your edges, though. Cut two 1/4"-diameter dowels to 3 1/4" long.

Stack the pieces together and attach them to each other by boring the two 1/4" holes on the pattern through the wood and putting 1/4" dowels in the holes.

Carefully cut out all the pieces using a #0/2 or #2

Lightly sand the ends.

To assemble, slide your cut pieces over the dowels in the order shown in the diagram. Put a little glue between the layers. Allow the dowels' ends to hang out a bit. Then, using a 1 3/8" Forstner bit in your drill press, cut a 1/4"-deep hole on the front of the clock for the clock insert. Finish sand your project and apply two coats of a clear finish. I used a simple varnish and applied a coat of paste wax. Add the battery and the clock insert and you're ready to show off. Watch your friends' reaction when they see this shelf clock and you tell them you did it with a saw. **PW**

Garden Windmill

THE LITTLE SHOP
project
#10
THAT COULD

Learn to cut compound miters on your table saw to make this amazing windmill.

EVEN THOUGH I've constructed hundreds and hundreds of projects — most of them more complex than this garden decoration — I've always been a bit skittish about compound miters. This project is a bit of a “workshop” on the subject and in the end, it's a real confidence booster. I guess it's reassuring to know that geometry works, and there are reference tables to look up compound angle cuts.

Steve Shanesy is editor of Popular Woodworking.

Editor's Note

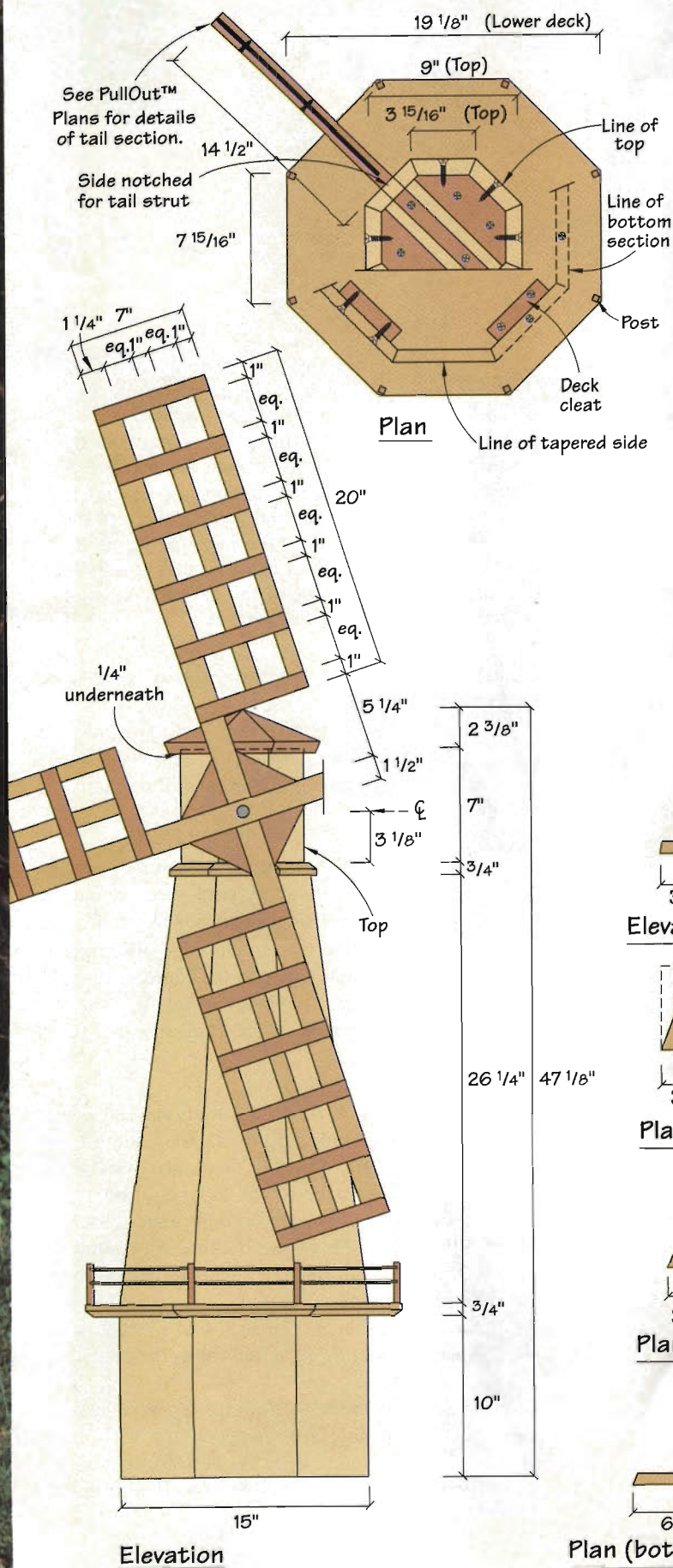
In issue #91, I built this workshop on wheels, which folds in half for storage. Then I outfitted it with \$498 in tools and equipment. Reckoning many of you work in small shops with limited tools, I wanted you to know that we can work that way, too. “Little Shop” projects are designed to be built simply. We've sold out of this back issue, but if you would like a photocopy of the article and plans, send a check for \$1.50 to: The Little Shop That Could



• Popular Woodworking • 1507 Dana Ave. • Cincinnati, OH 45207.



DIAGRAMS

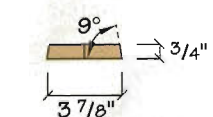


Schedule of Materials: Garden windmill

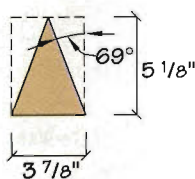
No.	Item	Dimensions T W L	Material
8	Bottom sec.	3/4" x 6 1/4" x 10"	Plywood
8	Midsection	3/4" x 6 1/4" x 26 1/4"	Plywood
1	Lower deck	3/4" x 19 1/8" x 19 1/8"	Plywood
1	Top deck	3/4" x 9" x 9"	Plywood
8	Top section	3/4" x 3 1/8" x 7"	Plywood
8	Roof	3/4" x 3 7/8" x 5 1/8"	Plywood
2	Prop	1" x 1 1/2" x 52"	Redwood
4	Prop blocking	1" x 2 1/8" x 4 1/2"	Redwood
24	Prop blades	3/8" x 1" x 7"	Redwood
8	Prop blades	3/8" x 1" x 20"	Redwood
8	Posts	3/8" x 3/8" x 2 1/2"	Redwood
1	Pivot plate	3/4" x 6 1/2" x 6 1/2"	Plywood
1	Bottom plate	3/4" x 13 3/4" x 13 3/4"	Plywood
1	Bottom plate cleats	1" x 1" x 4 1/2"	Plywood
4	Lower plate cleats	1" x 1" x 4 1/2"	Plywood
2	Top cleats	1" x 2" x 6"	Plywood
2	Roof cleats	3/4" x 1 1/4" x 2"	Plywood
2	Tail strut	1" x 1 1/2" x 23"	Plywood
2	Tail fin	10" x 13 1/2"	Copper

Home center: Threaded rod, nuts, washers, Lazy Susan Bearings: Grainger • item # 4x727 • 800-323-0620

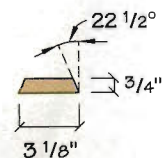
*TRIM: Use 15' of 1/8" x 3/8" trim along the bottom of each section and for the door and window headers. Use 2' of 1/8" x 1/4" trim for door and window muntins. Use 2' of 1/8" x 3/16" trim for window mullions.



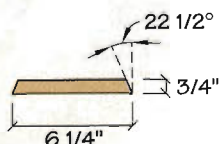
Elevation (roof)



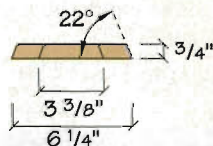
Plan (roof)



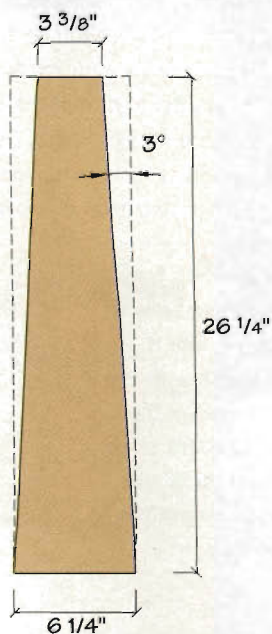
Plan (top)



Plan (bottom section)



Plan (midsection)



Elevation (midsection)

WINDMILL



1 STOP SIGNS • Cut the stop-sign-shaped lower deck by first cutting a square, then clipping the corners using 45-degree miter cuts. See the box below to learn how to lay out the eight-sided shape that gives you the line to cut to.



2 FIRST TAPER • Cut the tapered miters on the midsection using an adjustable tapering jig. For the first cut, tilt the blade to $22\frac{1}{2}$ degrees, then adjust the tapering jig so the start of the cut and end are parallel to the fence. For this cut, the taper goes from the bottom of the part to the top.



3 SECOND TAPER • To make the second tapered miter cut reverse the tapering jig so that the stop is on the leading edge of the cut. Adjust the tapering jig as before. On this cut, you're starting at the top of the part and cutting toward the bottom.

The octagonal shapes that make up this windmill include both straight miter cuts and tapered miters. When all the sections are stacked up and the four-bladed fan is attached, the assembly stands 66" off the ground. The blades turn on a ball-bearing mounted shaft, and the top section pivots 360 degrees to catch the wind. The secret? A simple Lazy Susan swivel.

Because this Dutch classic will see all manner of weather, it's built from one sheet of exterior-grade CDX fir plywood and solid redwood. All joints were glued using water-resistant polyurethane glue.

Start by making the bottom section. Cut the eight parts according to the Schedule of Materials, then cut a $22\frac{1}{2}$ -degree bevel on both long edges, then glue them up using band clamps.

Start by making the bottom section. Cut the eight parts according to the Schedule of Materials, then cut a $22\frac{1}{2}$ -degree bevel on both long edges, then glue them up using band clamps.

1 Cut an Octagon • Next cut the octagonally shaped lower deck. Start by cutting a square, then lay out the octagon following the instructions in the box at left. Cut the corners before undercutting the bottom edge of the piece. Do this by tilting your saw blade to 25 degrees, then set your fence to leave $\frac{3}{8}$ " of a flat on each edge. Run the part on edge in the same manner you would raise a door panel using the table saw.

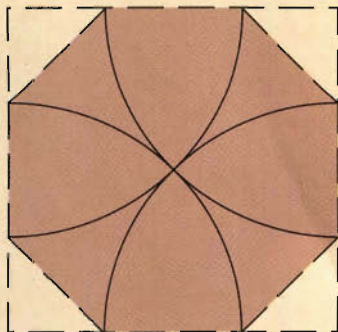
2 Find Your Center • To cut the long tapered pieces that make up the mid-section of the windmill, rip eight pieces to a width of $6\frac{1}{2}$ ". Next take one of the pieces and lay out the shape of the taper by finding the center of the width of the board on both ends. From the center, establish the width of the bottom, $6\frac{1}{4}$ ", and the top, $3\frac{3}{8}$ ". Draw a pencil line between the marks on the ends to show the taper.

Cut the compound angles on one side of each piece using an adjustable tapering jig as shown in the photo.

3 Cut the Second Taper • To cut the taper on the other side I had to turn my jig so that the stop was on the infeed side of the cut rather than the outfeed. Although I had never used the jig this way before, it worked fine.

Lay Out an Octagon

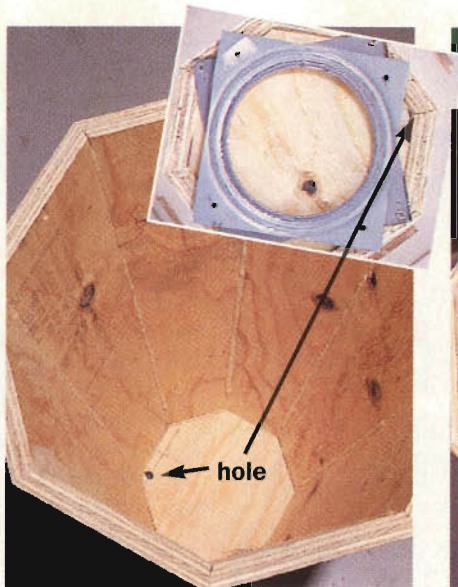
This method goes back to the time of Pythagoras and the ancient Greeks. All you need is a trammel, a straight edge and a surface to work on. First, cut the top square. Next, determine the center of the top by drawing intersecting lines with a straight edge, from opposite corners, across the top. Set your trammel points to make a mark as long as the distance from the center to an outside corner. Put the pin in one corner. Pivoting from the corner, draw a radius where it intersects with the square along the two adjacent sides. Repeat for all corners. Connect the marks.





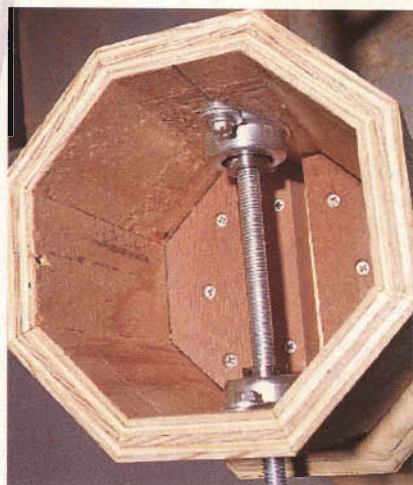
4 WHY THEY MAKE BAND CLAMPS

• After gluing the edges, stand the parts upright. Use masking tape on the top of each joint to help hold them in place. Place the band clamps around the assembly and cinch up tight. The clamp pressure pulls the parts into proper position.



5 THE CRITICAL HOLE • The small

hole in the top of the tapered section provides the access to the screw holes for fastening the Lazy Susan to the top deck after the pivot has been screwed down to the top from above. The inset shows the other side.



6 THE VIEW FROM THE TOP • It's

busy inside the top. Note attachment of flange mounted bearings, both front and rear, cleats for attaching the top to the top deck, and fastening the wood section of the tail seen below the all-thread propeller shaft.

4 Tape Helps • Gluing up this leaning eight-piece assembly is manageable by yourself. As you add parts, however, it gets a bit awkward. A piece of masking tape over the joints at the top does the trick. With the parts in place, cinch the band clamps to pull the parts together.

After the glue has dried, you need to put a pivot plate in the small end of the assembly. Simply set a piece of plywood on the top and draw the eight-sided shape using the inside edges as your guide. Cut the top using your jigsaw with the base of the saw angled to about 6 degrees. When done, glue the edges and nail it in place.

5 Lazy Susan Secret • It's on this pivot plate that you'll mount the 6" Lazy Susan. But if you haven't cut out the top deck yet, do so now following the same directions as cutting the lower deck. Now, if you've never installed a Lazy Susan swivel, let me save you a little head scratchin'! Screwing it to the surface it rests on is easy. But how do you fasten the top part to it? The trick is to work from below the part that it's first secured to. You gain access to the screw holes by drilling a hole through the pivot plate, putting in one screw, turning the swivel a quarter turn, putting in the second screw and so on until all four screws are in place.

6 Make the Machine House • With the top deck in place, move on to the top section, which houses the bearings. Cut and assemble the eight parts. Once the glue is dry, bore a $\frac{5}{8}$ " hole in one side that's 4" down from the top and centered on one face. On the bottom edge in the center of the opposite side, cut a notch with tapered sides to fit the wood portion of the tail assembly (see diagram).

Now install the two flange-mount bearings using a

socket wrench to drive the short lag screws. There are elongated holes on the flange-mount bearings so you can fine-tune the positioning later.

7 Cut the Roof • Make the roof by cutting out rectangles of the same size, then make two jigs to cut the tapers. Plans for the jigs are in the PullOut™ Plans.

To glue up the top, the band clamp is once again just the ticket. However, some downward pressure is needed as well. To provide this, I drilled a large hole in a board, positioned the hole over the point in the roof, then clamped the ends of the board with equal pressure. Not much clamp pressure is required.

8 Assembly • With everything made except the propeller, assemble the structure. Cut a bottom plate for the bottom section following the same method as described in step six. Next glue and screw four cleats that are up $1\frac{1}{4}$ " from the bottom. Then drill clearance holes in the bottom and screw the bottom into the cleats.

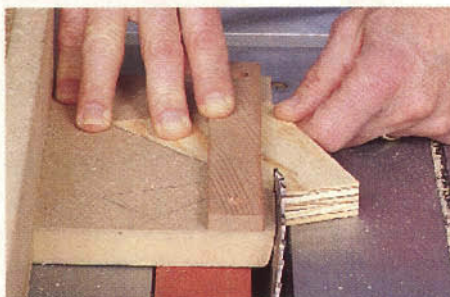
Screw the lower deck to the bottom assembly next. Lay out the location of the bottom on the deck to determine where to screw through the deck into the edge of the sides. After drilling holes for the screws, attach.

To secure the tapered section to the deck, screw cleats to the deck, then screw through the tapered section at the bottom to secure it to the cleats. Do the same to the top (see photo 8). Now screw the wooden tail piece to the top deck. To attach the roof, you'll also use two cleats, only these require one edge to be cut at an angle so they are parallel to the sides. Glue them to the underside of the roof, then screw through the top near the top edge to anchor to the roof cleats.

WINDMILL

7 ROOF WORK •

After cutting the pieces to make the roof parts, use the first jig to cut one side of the roof part with the saw blade tilted to 9 degrees. The second cut uses the second jig. This time, a strap across the part works as a safety feature to prevent the part from hanging up in the saw blade while making the cut. As in the previous photo, the actual part is in the jig.



Build the Propeller

Start with two pieces of redwood 1" x 1½" x 52". After finding the center of the two pieces along the length, create a cross-lap joint by making multiple passes on the table saw. Before gluing the pieces, you must saw the angle on the edges of the parts to create the proper pitch of the propeller blade. First set your saw's angle to 20 degrees. Next mark 21" from both ends on opposite faces of both pieces. Now make one angle cut to the pencil line you just marked, then turn the part and make the next angle cut on the opposite edge to the pencil mark. When done, glue these together forming the cross shape. Later, reinforce the joint with triangular corner blocks glued in place. Cut the blocks so that you have short grain on each glue edge rather than long grain on one edge and cross grain on the other. This makes a stronger joint.

Now rip out the strips you need to make up the rest of the fan blade. See the Schedule of Materials for quantities and lengths. Use glue and wire nails and assemble following the diagram.

I guess it's appropriate to complete the construction phase of the project with the tail. I used a piece of scrap copper sheet metal, but a piece of galvanized steel would do just fine. Cut the metal to the shape provided in the PullOut Plans. Mount it in the tail strut by first jigsawing a kerf in the wooden tail part that's as long as the metal part. Next drill two holes halfway through the wooden part, stopping at the saw kerf you just cut. Now slip the metal part in so that it is equally divided by the wood part. Use a nail to dimple the metal, marking the location of the holes just drilled. Drill holes in the metal, put the metal back in the wood part, then screw through the wood and metal holes and into the other half of the wood tail section.

To mount the propeller, drill a ½" hole in the exact cen-

8 ASSEMBLY • Simple

cleats are used for fastening one section to another. Not only do they secure the tapered section to the deck and the top to the upper deck, but also the lower deck in the bottom section and the roof to the top.



ter of the propeller and make sure you drill straight through. Next cut a length of ½" all-thread rod that's 14¾" long. Insert the rod into the bearings mounted on the inside of the windmill's top. My flange-mount bearings were fitted with set screws, which I tightened. Now use a combination square to see if your rod is projecting square out the face of the top and adjust as necessary. Mount the propeller on the shaft, securing it with a nut and washer on both the front and back of the propeller.

Fight the temptation to give the blade a big "victory" spin. Rotate it slowly making sure it clears the windmill structure in all positions. Now give it a good whirl!

All that remains is sanding, painting, cutting the small pieces that go on last to represent the windows and doors. Apply these small parts with cyanoacrylate glue after painting. Lay out the locations of the pieces and hold each piece in place for a moment while the glue dries.

Set Up Your Windmill

When setting up your windmill outdoors I recommend you place it on cement pavers to keep it off the ground and make sure it's level. Although it uses most of a sheet of ¾" plywood and therefore weighs 30 pounds or more, you might want to consider filling the base with dry sand that's been put in a couple of heavy-duty garbage bags. That should prevent all but hurricane-force winds from blowing it over.

My windmill turns with a gentle breeze. If yours isn't so inclined, make sure your bearings are turning easily. You can also make "sails" from cloth to cover the blade frames, which is actually how many real windmills were used and, to a degree, had their speed regulated.

The Dutch had a saying regarding their use of and affection for windmill technology, which I'll paraphrase here, "Only the wind is free." After building this windmill, I'd have to add that the lesson in cutting and assembling compound miters was "free" as well, and for a woodworker, quite valuable. **PW**

Build a Grandfather Clock, But don't use his clamps

German made clamps by Gross Stabil make construction of this American Shaker classic a joy. Your joints will be pulled tight every time, just like clockwork.



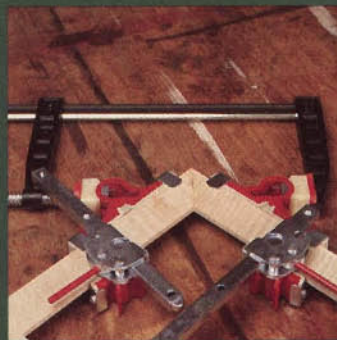
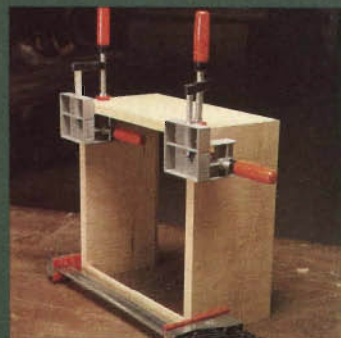
Parallel Clamps for Casework Assembly

For casework clamping, such as the lower clock section, the 5½" deep parallel clamp jaws, half ton of pressure, and protective polyamide pads speed glue-up and help assure square alignment of the parts. The jaws can also be used parallel to the clamp's bar meaning fewer clamps are required and pressure is equal along the length of the jaw.

To hold the long parts in place during glue-up, a few biscuits were used to hold the work while clamping.

Multi-Spanner controls pressure on corners

While assembling the Grandfather clock's upper case, Gross Stabil's Multi-Spanner clamp applies controlled pressure for corner clamping. It is applicable to many 90 degree clamp set-ups. This unique zinc-alloy clamp also works well for miter, dovetail, box or rabbet joints and can even be clamped to a bench for use as a vise. While clamped, nail the top of the upper case to the sides in the rabbet joint. Clamp the haunched tennon stretcher across the lower front of the case.



Clock face door uses miter joints with biscuits

After rabbetting the inside edge for the glass and cockbeading the outside edges, cut the miters, cut biscuit slots, then glue and clamp the miters. Miter clamping with the versatile Maxi-Miter Jig, also from Gross Stabil, exerts clamping pressure across the joint, secret to a tight miter.

In addition to miters, the Maxi-Miter is perfect for clamping curved parts, profiled surfaces and odd angled stair parts that would require custom clamping cauls.

One-handed clamp for two hand operations

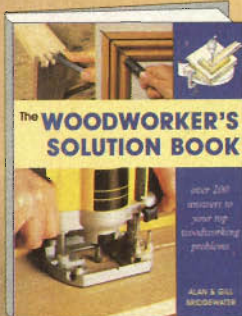
Assembling the stand for the clock works is a situation when a clamp that needs only one hand to operate frees the other hand for aligning parts. Gross Stabil's Quick-Star spring loaded clamp brings the lower clamp jaw into perfect tensioning position using just one hand.

Unique, yet practical, clamping products of the highest made quality are the hallmark of the Gross Stabil name. For information on dozens of clamp styles from Gross Stabil, call (800) 671-0838. See the next issue of *Popular Woodworking* for complete plans for this Shaker style grandfather clock.

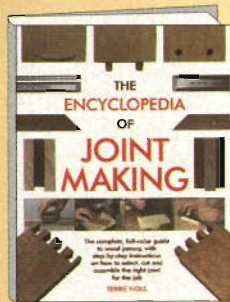


CHOOSE 2 BOOKS

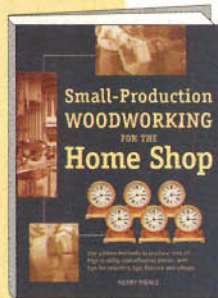
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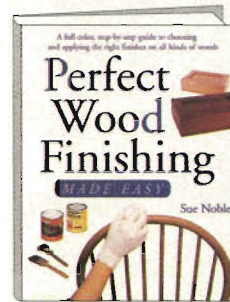
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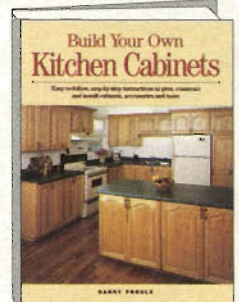
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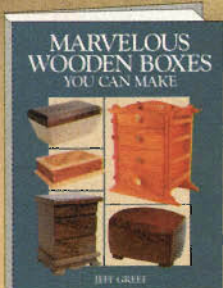
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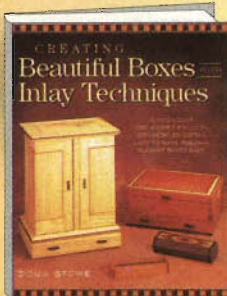
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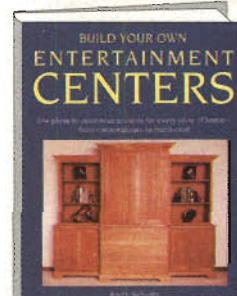
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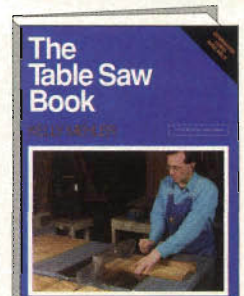
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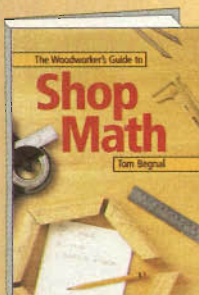
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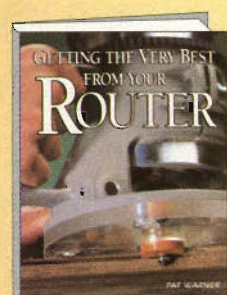
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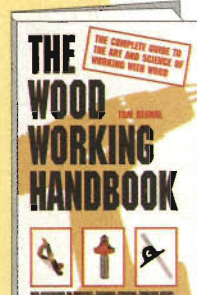
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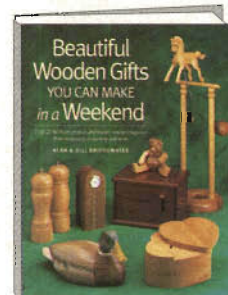
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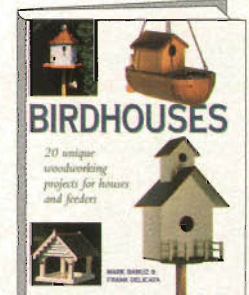
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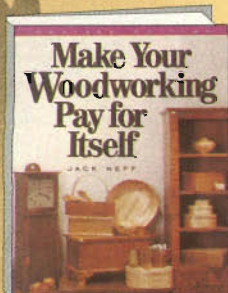
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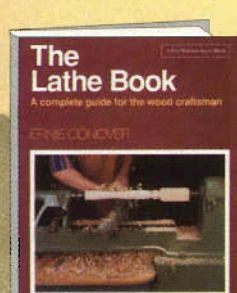
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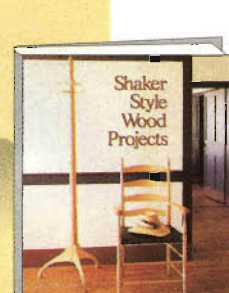
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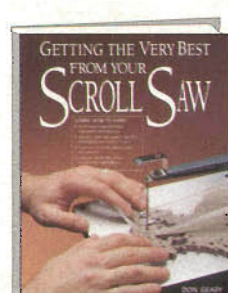
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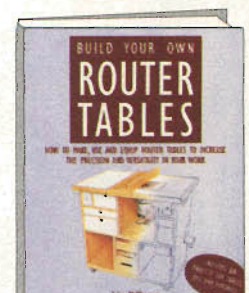
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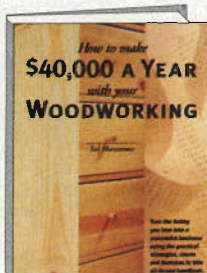
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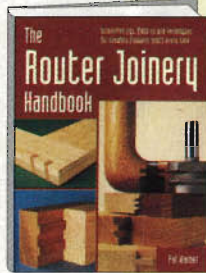
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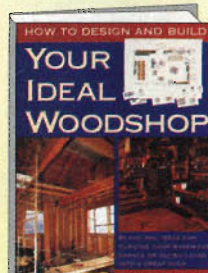
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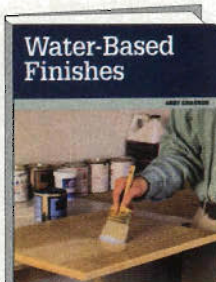
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Chair-Side Reading Table

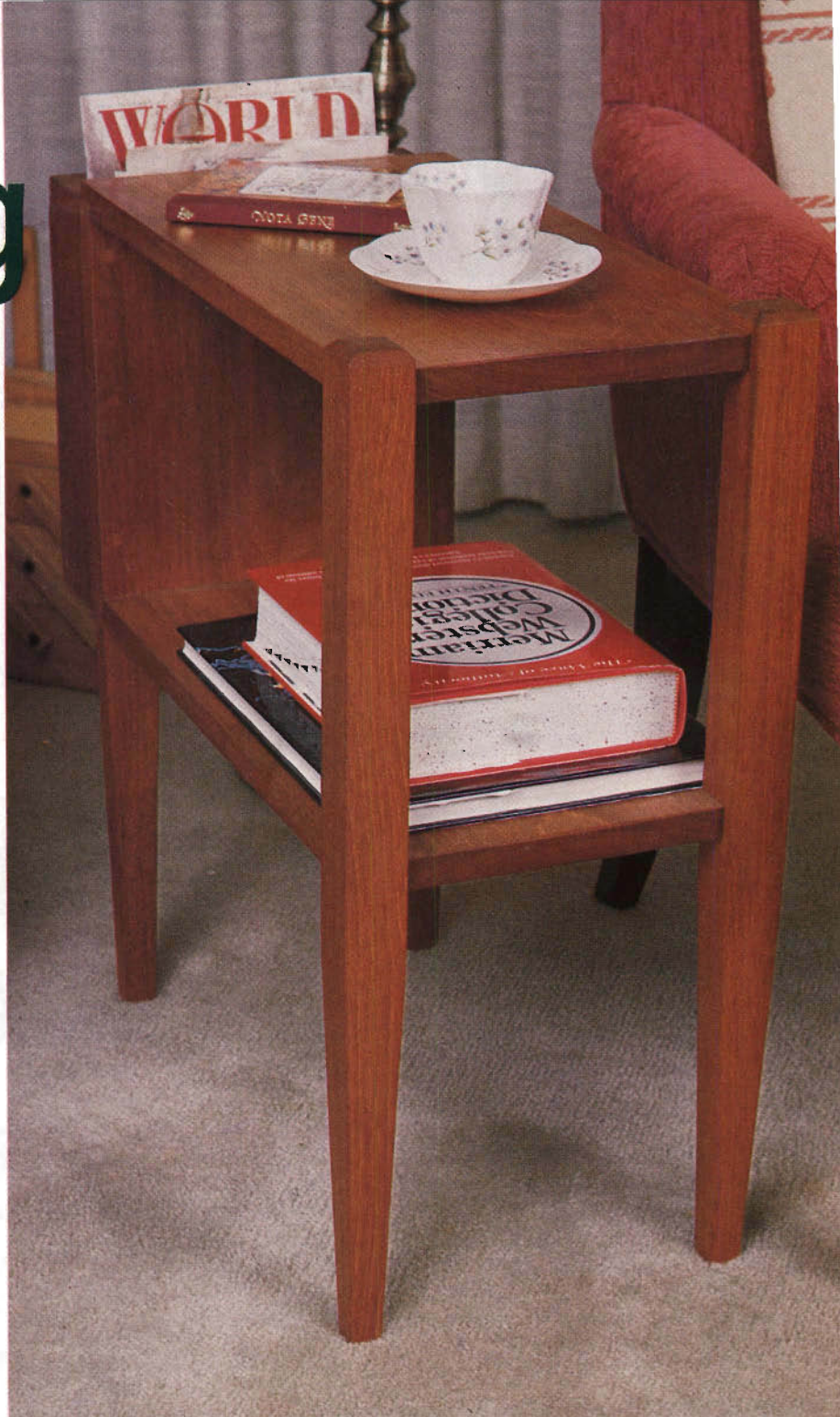
This simple weekend project provides a handy table with storage and teaches simple techniques with only a few tools.

I USED TO HAVE a stack of magazines and books so deep on my chair-side table I couldn't find the top. With this simple weekend project I've uncluttered my favorite reading spot and still kept everything right at my fingertips. The only tools required are a table saw, band saw and some chisels.

1 Cut the Legs • Begin with the front legs, which you can get from $\frac{3}{4}$ " stock (2" thick). I didn't have any, so I glued together two pieces of 1"-thick mahogany for each leg. The rear legs are part of the $\frac{3}{4}$ " back and require no glue-up. Once out of the clamps, clean up the edges and square the legs on the table saw to the required $1\frac{1}{2}$ " x $1\frac{1}{2}$ " dimension. Use a tapering jig to taper all four faces of each leg starting 11" up from the bottom. The jig I used is adjustable for a variety of tapers and was set to taper the legs to leave a 1" square foot.

Once you cut a taper on one side of a leg you no longer have a straight edge to hold against the jig when you flip the leg to cut the other side. To align the leg correctly, use a wedge-shaped cutoff from the first cut to properly position the leg for the next cut.

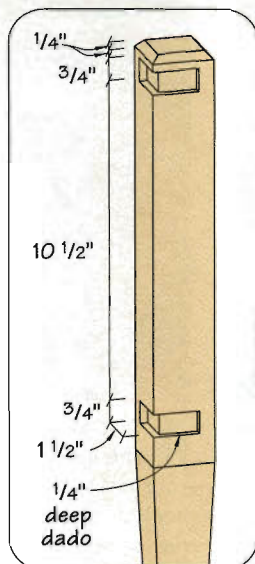
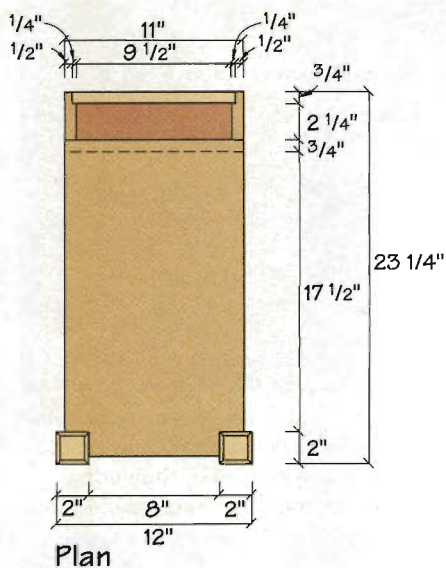
2 Dado the Front Legs • Mark the locations for the $\frac{1}{4}$ "-deep stopped dados on the front legs as shown in the



drawings. Because the dados don't run all the way across the leg, using a dado stack in a table saw would require stopping the cut and cleaning up the rest of the dado with a chisel. For this reason, I cut the whole thing with a chisel. But using a dado stack has the added advantage of creating clean and straight walls, so if you are unsure of your skill with a chisel you may opt for this additional step for the sake of machine accuracy. Next, set your table saw's blade to chamfer the top edges of the legs.

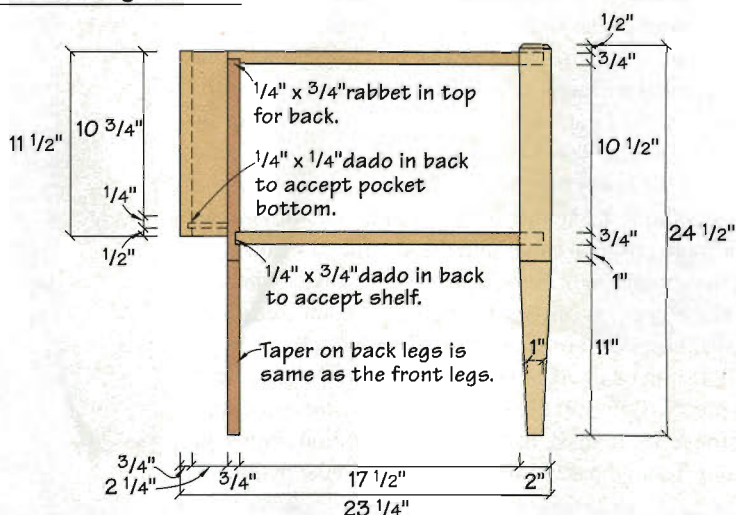
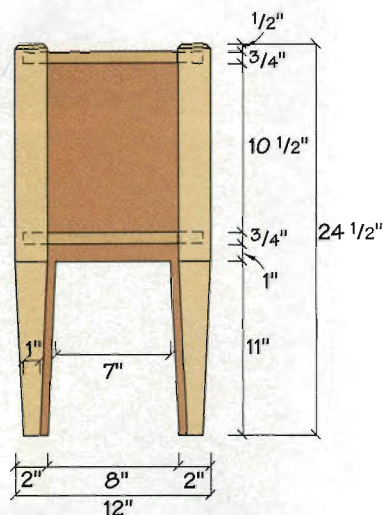
Jeff Greef works wood and writes about it in Santa Cruz, California.

DIAGRAMS



Schedule of Materials: Reading table

No.	Item	Dimensions T W L	Material
2	Legs	1 1/2" x 1 1/2" x 24 1/2"	Mahogany
1	Top	3/4" x 11" x 19 3/4"	Mahogany
1	Shelf	3/4" x 11" x 19 3/4"	Mahogany
1	Back	3/4" x 11" x 23 1/2"	Mahogany
2	Pocket sides	3/4" x 3" x 11 1/2"	Mahogany
1	Pocket back	3/4" x 11" x 11 1/2"	Mahogany
1	Pocket bottom	1/4" x 2 1/2" x 10"	Mahogany



1 SAVE THE CUTOFF • Use a piece of tapered cutoff from the first cut to space the leg away from the jig when a tapered edge faces the jig.



2 HAND-CHOPPED DADOES • Cut the dadoes in the legs with a sharp chisel. Make them small at first, then test the fit of the shelf stock, and widen them until you have a snug fit.

READING TABLE



3 RABBETS • Make rabbet cuts on the back edge of the top and on one long side of each pocket's side. If you don't have a dado set, use a similar setup with your regular blade, making several passes to complete the cut.

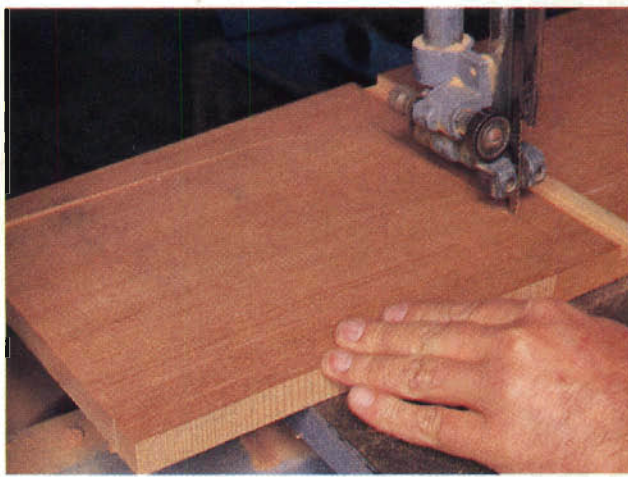
3 Build the Shelf • Next cut the top, shelf, back and magazine holder pieces to the sizes given in the Schedule of Materials. The top requires a $\frac{3}{4}$ "-wide x $\frac{1}{4}$ "-deep rabbet on the back edge that will accept the table's back piece. Set up for this with a $\frac{3}{4}$ " dado stack in your table saw. Screw a sacrificial wood face to your fence as shown in the photo, install the dado cutter, then lower the cutter below the table. Place the fence in position to make the $\frac{3}{4}$ "-wide cut, then turn on the saw and slowly raise the cutter into the sacrificial wood face. Then set the cutter height at $\frac{1}{4}$ " and cut the rabbet as shown. Use this same setup to run one long edge on each side piece of the magazine pocket to accept the pocket's back.

You'll also need to cut a $\frac{3}{4}$ "-wide dado in the middle of the back piece to support the shelf. Make this cut by simply resetting the fence to make the dado at the location shown on the diagram. To hold the $\frac{1}{4}$ " bottom in place in the magazine holder, cut a $\frac{1}{4}$ "-wide dado in the bottom inside edge of the magazine holder sides and back. This can be done without a dado cutter using your regular blade and taking several passes to achieve the width required.

4 Back Legs • The last step before assembly is to cut out the area in the back piece to form the two back legs. Mark the back as shown on the diagram, then cut out the center section. An alternative is to rip the back into three pieces, cut off the middle, then glue it back together.

The final step before assembly is to notch the front corners of the shelf and top to fit into the leg dados. Use a band saw or hand saw for this.

5 Assembly • Start assembly by gluing and clamping the magazine holder back into the rabbets on the holder's sides. While this dries, bore holes for screws using tapered bits with countersinks to attach the back piece to the shelf, and screw in place. Next, glue the shelf and top in place in the front leg's dados. Put one screw in each joint where the top and shelf meet the legs, then glue the back into the top rabbet. Clamp and let dry.



4 ONE MORE CUT • Cut away the inside area between the back legs on the back with the band saw. Round your cut into the corner from one direction, then come back and complete the corner from the opposite direction rather than try to force the blade into too tight a turn.



5 ASSEMBLY • Pre-drill for the screws that hold the table together. Countersink bits will pre-drill holes wide enough to take plugs to cover the screws after assembly.

To finish assembly, again drill holes (through the inside of the back this time), to attach the magazine holder to the back. Simply slide the bottom in place before screwing the holder on. Then cut plugs to cover all the screws and glue them in after the screws are in place.

Round over the edges with sandpaper and you're ready for the finish of your choice. I used Watco oil because it's easy and looks nice. **PW**

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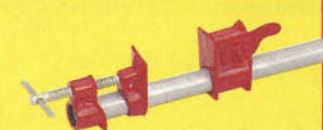
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- 3-1/2 lbs. tool weight
- Factory reconditioned, factory perfect

ITEM
51663-75BA

~~\$499~~
\$399

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24 PC. FOAM BRUSH SET

Got a fast touch-up job? Want to stain a furniture project, but don't want to use your best brushes? Foam "bristles" hold a load of paint or stain without dripping. Toss out when you're done. If you're using water-based paint, you can rinse and re-use. Includes ten 1" brushes, eight 2" brushes and six 3" brushes.

ITEM
38647-15BA

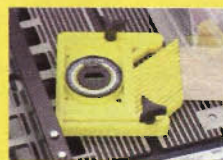
~~\$699~~ **\$599**

10 PC. FOAM BRUSH SET

Includes four 1" brushes, three 2" brushes, two 3" brushes and one 4" brush.

ITEM
39991-25BA

~~\$399~~ **\$299**



FEATHER BOARD WITH ANGLE FINDER

Get two essential tools in one! The feather board ensures smooth, precise feeding of stock while preventing kickback and blade binding. The built-in angle finder and level help adjust miter and blade tilt. Angle lock collar allows accurate repeat measurements. Magnetic base keeps the tool on the table when not in use.

ITEM
36697-25BA ~~\$499~~ **\$399**

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SAFETY GOGGLES ~~\$299~~ **\$299**
ITEM 35710-05BA

CENTRAL MACHINERY



12" DIRECT DRIVE BENCH TOP DISC SANDER

- Table tilts to 45°; 2" dust collection outlet; fan-cooled brushless motor; miter gauge
- 1 HP, 120V, 10.0 amps
- Wheel diameter: 12"
- Includes 60 grit, 12" sanding pad
- No load speed: 1793 RPM
- Base: 13" x 10"
- Shipping weight: 92 lbs.

~~\$1299~~ **\$899**
ITEM
37297-3SBA

12" SANDING DISCS

Come in packs of 2.

GRIT	ITEM	PRICE
60	37958-15BA	\$699 \$699
120	37959-15BA	\$699 \$699
240	37960-15BA	\$699 \$699

CHICAGO ElectricPower Tools

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OFF!



HEAVY DUTY 4-1/2" DISC GRINDER

- 5/8"-11 spindle with 7/8" arbor adapter
- Motor: 3/4 HP, 115V, 5.18 amps
- Spindle lock • 11-7/8" long
- High powered 10,000 RPM

ITEM
31135-6SBA

4-1/2" x 1/4" GRINDING WHEELS

- 24 grit, 7/8" arbor

FOR	ITEM	10 PACK
Metal	06674-05BA	\$899 \$899
Masonry	07422-25BA	\$899 \$899

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SIZE	QTY.	ITEM	PRICE
1"	36	04181-3SBA	\$599 \$599
2"	36	04182-1SBA	\$899 \$899
3"	12	04183-3SBA	\$499 \$499
4"	12	04184-3SBA	\$999 \$999

CHICAGO ElectricPower Tools



3-1/4" PLANER

- Front base has a V-groove to help guide in chamfering
- 2 blade cutter
- Depth adjustment knob
- Includes rabbeting guide plate/fence, sharpening holder, blade setting jig, replacement brushes, replacement belt
- D-handle with lock-on button
- 110V, 5 amps, 17,000 RPM
- 34,000 cuts per minute
- 1/10" maximum depth of cut; 3-1/4" planing width
- Tool weight: 6-1/4 lbs.

ITEM
32222-3SBA

2 PC. REPLACEMENT BLADES

ITEM 33262-05BA

~~\$5399~~ **\$3999**
~~\$999~~ **\$999**

CENTRAL MACHINERY

10", 2 HP BENCH TABLE SAW

- Die cast aluminum table 26" x 16", has adjustable 17-7/8" x 2" rip fence and inch/metric scale for precise cutting. Blade adjustments control angle and depth of cut. Anti-kickback fingers & see-through blade guard for safety.
- Max. depth of cut at 90°: 3-1/8"; at 45°: 2-1/2"
- Blade & stand sold separately
- Blade capacity: 10" with 5/8" arbor
- Miter gauge adjusts 0° - 60° left and right
- Motor: 2 HP, 115V, 60 Hz, 10 amp, 4500 RPM
- Shipping wt.: 36 lbs.

ITEM 38533-15BA

SAW STAND

ITEM 35716-05BA

10" 40 TOOTH CARBIDE TIP SAW BLADE

- 5/8" arbor
- ITEM 00529-4SBA



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~~\$1599~~ **\$1599**
~~\$999~~ **\$999**

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This spindle attachment turns almost any drill press into an oscillating spindle sander. Accepts up to 3" sanding drums. Includes table with dust outlet, 1" and 2" steel inserts, 2 drive belts, gear box, belt guard, mounting bracket and hardware.

- 40 SPM on 2" diameter drill chuck running at 2000 RPM
- 3/4" stroke
- 8-1/2" x 8-1/2" table
- 2-1/4" diameter dust outlet

ITEM
53508-2SBA

44 PC. SANDING DRUM/ SLEEVE ASSORTMENT

ITEM
53509-05BA

24 PC. SANDING SLEEVE ASSORTMENT

ITEM
53510-05BA

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TOOLGUIDE, sole distributor in the U.S. for Festo Tooltechnic, presents a complete line of German precision power tools. All Festo tools (except drill) feature integrated dust extraction for a clean, healthy work environment. Toolguide's objective is to provide the finest power tools for the professional installer and craftsman who demand the best. For free full catalog and price list, call 888-337-8600 or **Circle #121.**

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ADAMS WOOD PRODUCTS is a manufacturer of solid wood furniture components. They make a variety of table bases, Queen Anne table legs, claw & ball table legs, turned legs, plus a variety of ready-to-assemble and finish dining chairs & occasional tables. These items are carried in stock in a variety of woods. There is no minimum order size as they can be purchased one at a time. **Circle #100.**

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Ryobi's WDP1850 Wood Drilling System

If you're shopping for your first drill press, save your pennies and buy this one. You'll be happy with your decision for years to come. Ryobi's WDP1850 has been in the *Popular Woodworking* shop since the spring of 1996, and it has lived up to its billing as a drill press designed for woodworking, not metal working, like most drill presses.

How is it different? For starters, forget about messing with belts to adjust the motor's speed. To adjust the speed on the WDP1850 simply turn a control knob — with the machine running — and change the speed between 500 and 3,000 rpms. Most woodworkers (us included) don't always use the speed recommended by a bit manufacturer. With the variable-speed drive it takes only a second to adjust your machine to the proper speed using the scale mounted on the machine. This extends the life of bits by keeping them from overheating.

The unique VersaTable™ rotates 360 degrees and tilts 45 degrees in either direction, offering a flexible work surface. Quite honestly, the table on ours stayed in the flat position more often than not. But when it was needed, a quick adjustment simplified what would have required a very complicated setup on most drill presses.

The adjustable fence is sometimes awkward to lock in place, but when locked, it holds firmly anywhere on the width of the table. It also offers a built-in sliding stop.

RECOMMENDATION: Three years ago the WDP1850 was a leap forward in drill press convenience for the woodworker. So far, no one has matched it. Costing about \$400, it is probably the most expensive benchtop drill press out there, but it offers the largest swing capability (18½") of any benchtop machine (except a radial drill press). The ease of use



RESULTS WDP1850

NICE FEATURES

- Variable speed control without rearranging belts
- Large 18½" swing capacity
- Beveling and swiveling table
- Adjustable fence
- Built-in hold-down on machine

RECOMMENDED MODIFICATIONS

- Brighter work light
- Improved fence clamping
- Sturdier stop/gauge on fence
- Find it on sale

To locate the Ryobi retail location nearest you, contact Ryobi at 800-525-2579, or at their website at www.ryobi.com

and flexible table system make its high price palatable.

We have two changes to suggest. The work light should be brighter. And the fence, while

functional and convenient, is too reminiscent of many low-end benchtop table

saw fences that don't always lock reliably in place.

That aside, the clever engineering, flexibility, performance and special features (including three separate depth-stop adjustments, a built-in hold-down clamp and 12" maximum clearance from quill to table, or 18" to the base with the table removed), make this the only drill press you'll likely ever need. **PW**

About Our Endurance Test: When a new tool hits the market we do our best to tell you what the benefits and pitfalls are with that tool. 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 for. We regularly pick a tool we've used in our shop for at least a year that has stood up to our regular use. We make sure the tools we've tested here are virtually unchanged from the versions in the store today. So when you see a tool written up in here, it has passed the *Popular Woodworking* Endurance Test. — David Thiel, senior editor

TRICKS of the TRADE

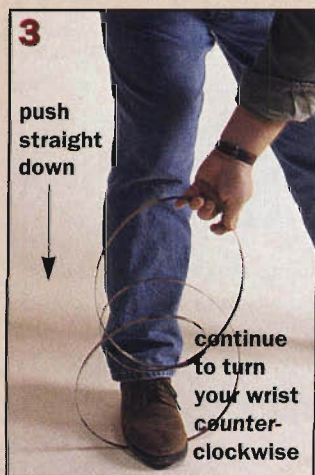
Each issue of *Popular Woodworking* offers tips and tricks for the woodworker that we've accumulated from readers, contributors and from our own workshop and woodworking experiences. We want to encourage the free exchange of these time-saving and safety ideas for all woodworkers. If you have a good trick, we'd love to hear about it. Send your trick, whether it's one your father taught you or one you came up with on your own, to *Popular Woodworking*, Tricks of the Trade, 1507 Dana Ave., Cincinnati, OH 45207.

HOW TO FOLD A BAND SAW BLADE

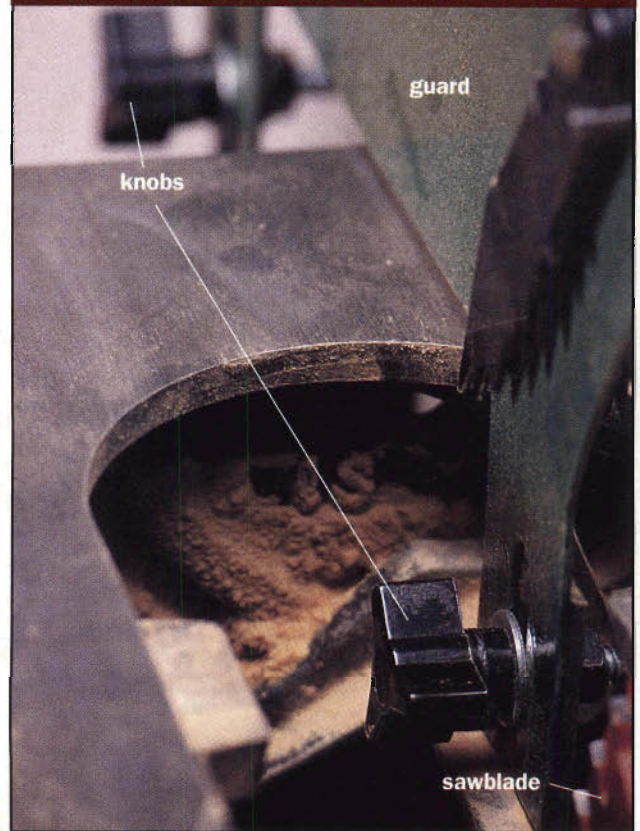
The One-Handed Method

When you buy a band saw, the owners manual provides lots of good information about the machine. What often is missing is how to handle the blade. Folding a band saw blade for storage is either an injury-defying task or a magic trick. For those of you who aren't magicians yet, we offer this pictorial how-to.

1. Grasp the blade in one hand with the teeth facing away from your body. Your arm is twisted in toward your body 270 degrees from its natural resting position. Place your foot on the lower portion of the blade, holding it against the floor.
2. Rotate your hand 180 degrees so the blade forms a figure eight.
3. Rotate your hand another 180 degrees in the same direction as the first time, collapsing the blade straight down toward the floor.
4. As the circles meet, use your other hand to adjust the three hoops. Grasp the conveniently sized folded blade for storage.



QUICK RELEASE FOR YOUR GUARD



Hob-Knobbins' for Safety

A lot of people don't use the guard on their table saw because it's a pain to remove and reattach. To make it easier to remove and reinstall the guard on my table saw during setups where the guard is a hindrance, I replaced the factory nuts and bolts with small knobs (1" - 1 1/4" diameter).


On some saws, you might have to remove the knobs when tilting the saw's arbor. But this minor inconvenience still beats fumbling with a wrench every time the guard is in the way.

David Allen
Rosharon, Texas


THE CORRECT PILOT HOLE SIZE

With deck season at hand it's important to remember how easily outdoor lumber can split. Predrilling your screw holes will save headaches both on your deck and in your workshop. The chart below will help you choose the right size pilot hole for your screw.

SCREW SIZE	PILOT HOLE DIA. - SOFTWOOD	PILOT HOLE DIA. - HARDWOOD
#4	3/64"	1/16"
#6	1/16"	5/64"
#8	5/64"	3/32"
#10	3/32"	7/64"
#12	7/64"	1/8"



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Wooden Wonderland

You, too, can change the weather using only your power tools and a moment of insanity.

EVERY SATURDAY MORNING I get up at 7 a.m. (like clockwork), absorb a cup of coffee and watch the cavalcade of woodworking gurus. All of the other craftsmen I know hate these shows because the proprietors (who are obviously well-sponsored) have at least two of every tool ever made. I've seen Norm Abram use six different routers on the same show. My brother, John, stopped watching PBS completely when he saw Norm had a drill press that could drill square holes.

I still watch the show religiously (I sometimes even videotape it), because Ol' Norm takes the time (and spends the money) to do a nice job. The difficulty, of course, is when I try to transfer what I've seen done using "all the tools in the world," out to my under-equipped garage. Improvisations must be made — tools used for purposes that they were not intended.

The trick is to get all the mileage that you can from the tools you have. You might be surprised at the flexibility that some things can provide. You might also note, that some tools are not as flexible as you might believe. For example....

I had finished up building some shutters the other night, and they were things of beauty. Naturally, I was standing almost knee-deep in sawdust and wood cuttings. I knew that it was going to take me several hours to clean this mess up (chiefly because I don't own one of those industrial strength shop vacuums). So I resigned myself to the inevitable, and I reached for the broom. Just then, something caught my eye from the corner where I keep the lawn mower. It was the "Black & Decker Vortex Lawn Mulcher."

When you have a half-acre yard that has a dozen oaks and maples standing on it, leaves are a problem. When you add the fact that all of the neighbors have the same kind of trees, it becomes a major problem. So last autumn I bought this big, life-sucking lawn vacuum that I could use to suck up all the

leaves. As an added bonus, this thing would also shred leaves and sticks into tiny dust fragments that it pumped out of its 8' exhaust hose onto the grass — good fertilizer.

Well, I looked at the machine. Then I looked at the saw dust. Then I looked at the machine, again. A few seconds later I had the exhaust hose crammed through the dog door, I had donned my safety goggles and my ear muffs and I was plugging the extension cord in. This was going to be SOOO easy.

I vacuumed with reckless abandon for 15 minutes. The machine just roared. Every once in a while it would crunch a little as it sucked a larger piece of wood through the grinder. It was a wonder of modern technology and improvisation.

I was happy.

I finished up the vacuuming and put the machine away. A quick wipe down with a damp cloth, and I was done in record time. I went inside, showered and sat back to enjoy a drink on the couch. Feet up. Then my beloved wife returned from visiting her mother.

"All done?" she asks.

"Ha-Ha! Yes. Yes, I am," I say, pleased with myself.

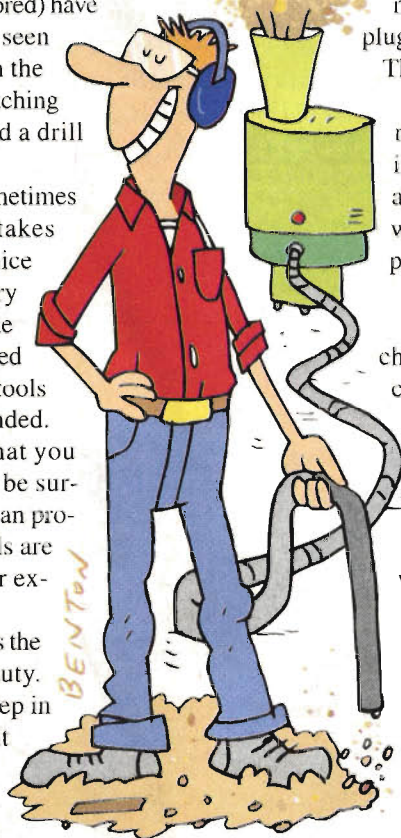
The wife then walked toward the kitchen, and she stopped short as she passed the dining room window. She mumbled a question to herself that was too quiet for me to understand completely. However, I did recognize one word: "snow." There was a half-second pause between that mumble and when the yelling started. Only then did I realize

that the lawn vacuum may not have completely disintegrated the sawdust.

In that instant, I covered my ears just as the words, "WHAT THE HECK HAVE YOU DONE?" exploded from my wife's head. You'll note that she automatically assumed that it was me who was responsible for the unseasonable snowfall. I hung my head low and went to the window. It was worse than I had imagined. There were two inches of new-fallen saw-snow covering half of the backyard. It was almost beautiful.

Suffice it to say, I spent the next hour out in the yard with a rake and a wheelbarrow trying to collect very, very fine sawdust. All the while I was cursing the lawn vacuum as my family looked on at the wintery spectacle. **PW**

Walt Akers is an amateur woodworker in Seaford, Virginia, and is still looking for innovative solutions in the shop... his wife continues to monitor his work closely.



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