

WORKBENCH[®]

THE ORIGINAL WOODWORKING AND HOME IMPROVEMENT MAGAZINE

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Gourmet Grilling Center

Great Projects!

- ▶ Classic Cherry Bathroom Cabinet
- ▶ Sharpening Store-All

PLUS:

- ▶ Turn Any Project Into A Country "Antique"
- ▶ 10 Best Shop Vacuum Accessories
- ▶ Hang Shelves Anywhere!

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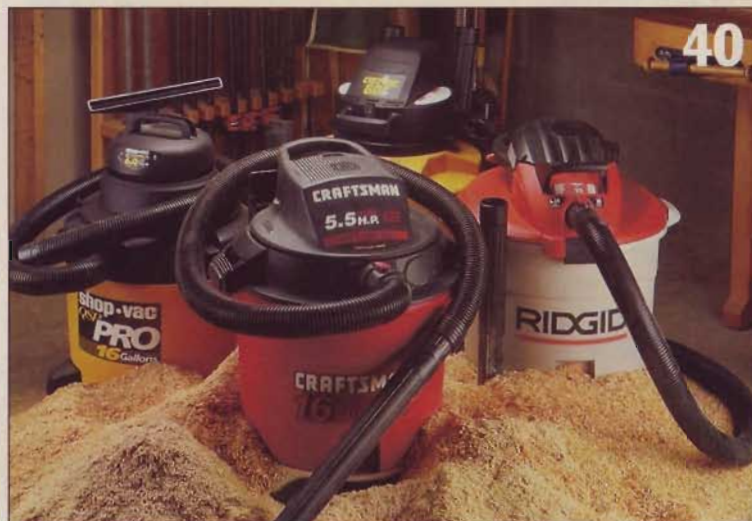


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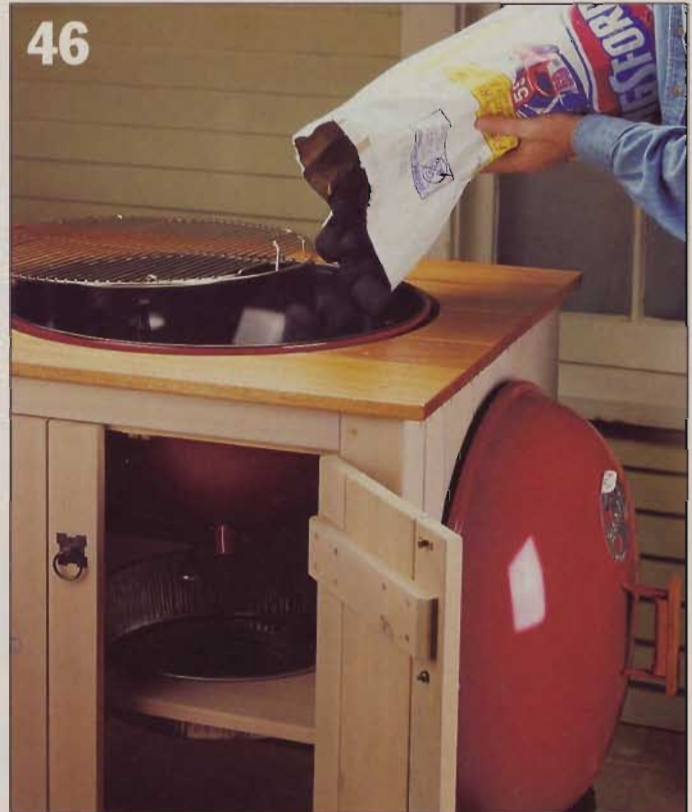
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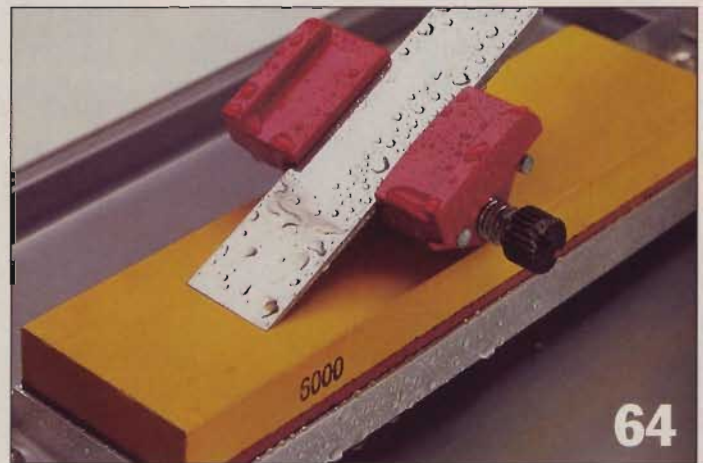


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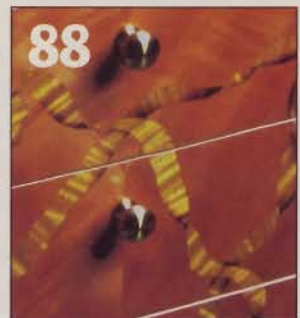
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EDITOR'S NOTES

When I was a kid, sharpening tools meant getting out an old beat-up Arkansas oil stone, borrowing some of dad's 3-in-1 Oil, and making a mess while trying to put an edge on my pocket knife.

Things certainly have changed. Today I use Japanese waterstones and they sharpen a lot quicker and cleaner. They're available in very fine grits so it's easy to get a mirror finish on chisels and plane irons. If you've never used a waterstone, I think you might be surprised how easy it is to get a sharp edge with one.

The real reward, though, comes when you're using a sharp chisel to pare a thin shaving off the end of a piece of hardwood. It's great to both *see* and *feel* the wood slice away like a ribbon of beef peeling off a meat slicer at a deli. If you want to know more about how you can get an edge this sharp, see the article on page 64.

Though I like a sharp tool, I don't like stopping when I'm in the middle of building a project to sharpen one chisel. So here's what I do.

I take an afternoon off from project building, set up my sharpening supplies, and then sharpen every dull tool in my shop. The next day I'm ready to get back to the project with a whole shop full of sharp tools.

To help keep my supplies organized for these sharpening sessions, I've designed a portable storage case (page 58). It's nothing fancy. Just a place to keep everything together. Now when that afternoon comes along, I can grab the case and get right to work.

HELP WANTED

Speaking of getting to work, we're working on upcoming issues and need some additional talented in-house editors, illustrators, and graphic designers. If you'd like to join our team, send a letter and resume to: S. Ribbey, 2200 Grand Avenue, Des Moines, IA 50312.

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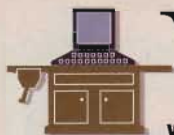
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Old House Web Has Something for Homes of All Ages

Hot Site www.oldhouseweb.com

From the name, it might sound like this Web site is only for people who own older homes. But anyone interested in home improvement — whether they're restoring a 200-year-old Tudor or trying to renew outdated kitchen cabinets — will find information and inspiration at this site.

The site is divided into 10 areas of interest. It's easy to move from one area to the next thanks to a navigation bar that stays at the top of the screen no matter where you go on the site (see *Site Details* at right).

I spent enough time on this site to say there is great information in all 10 areas. In particular, the *How To*, *Features*, and *Finance* areas are worth a visit. Here are some highlights from those areas.

How To: This area is full of step-by-step articles on everything from clearing clogged drains to building a genuine Rumford fireplace. The articles I read had a good balance of information and instruction and were easy to understand. (A couple more illustrations wouldn't have hurt, though.)

Features: In here you'll find plenty of inspiration for your own restoration project. Read other people's stories about their renovation projects and find out why it really is worth all the work.

Also in this area, you can take virtual tours of beautifully-restored historic homes, including the only home ever owned by U.S. President Abraham Lincoln.

Finance: There's a ton of information in here to help you calculate the cost of a project versus the value it adds to your home. Some of the best information from this area is represented in the table at right.



SITE DETAILS:

This navigation bar is available throughout the site, making it easy to move from one area to another.

Vote in The OHW Poll. Here are some recent results:
How do you plan to cool your house this summer?

Central air	36%
Window A.C.	20%
Ceiling and window fans	16%
Natural air circulation	28%

Think your house needs a lot of work? The trials and triumphs of a family restoring a century-old Victorian home might just be the encouragement you need to keep your own project on track.

The High Cost of Remodeling

If you've been looking around the homestead wondering what those much-needed improvements are going to set you back, your answer may be right here. The Old House Web recently added remodeling

cost estimates compiled by the Federal Home Loan Mortgage Corporation.

If your project isn't here, check out the complete list of 40 projects on the Web site.

PROJECT	ESTIMATED COST
Room addition _____	\$70 - 120 per sq. ft.
Remodel bathroom _____	\$7,000 to 12,000
Add half bathroom _____	\$3,500 to 5,000
Add full bathroom _____	\$7,000 to 12,000
Build masonry fireplace _____	\$3,300 to 4,800
Install pre-fab fireplace _____	\$1,800 to 2,300
Remodel kitchen _____	\$8,000 and up

Because You Don't Want to be Stuck With the Wrong Glue

Mining



The Web

This entire site is based on the idea that "People have a need to glue things to other things," and so this is where you find the right glue for nearly any job.

The site is incredibly easy to use. There are two pulldown menus that let you select the materials you want to bond. For instance, if you want to glue wood to metal, simply select "wood" in the first menu, and "metal" in the second menu. Then click on the "Lets Glue!" button and adhesives for the job are listed.

The suggestions seem good, but there's always room for disagreement as to the best glue for any job. That's not what this site is really about, though. The idea here is just to get things to stick together, and their suggestions will work fine for that.

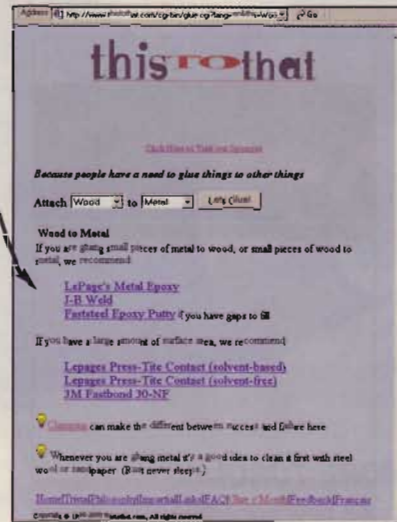


What really makes this site worth a visit is all the information about glue in general. Each glue recommended has a page that lists its toxicity, time to adhere, cost, and comparable alternatives. In most cases you can also link directly to the glue manufacturer's Web site.

And after all, isn't it about time someone devoted a Web site to gluing stuff together?

PROBLEM: First, select the materials you want to bond from the pulldown menus and click on the "Lets Glue!" button.

SOLUTION: Then check the list of glues for the job — complete with direct links to the manufacturers' Web sites.



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Questions & Answers

Simple Ways to Avoid Tearout When Cutting Plywood

Q Lately my oak plywood has been splintering a lot when I crosscut it. What can I do to avoid this problem?

Albert Rasmussen
Omaha, NE

A The best way to avoid splintering is to use either a carbide or steel blade with additional teeth made especially for cutting plywood.

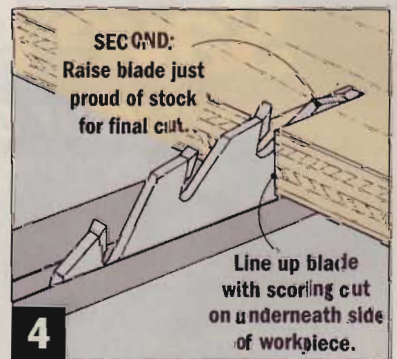
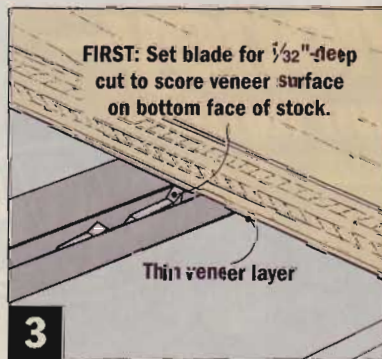
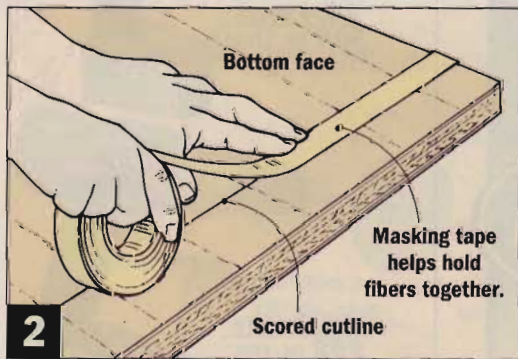
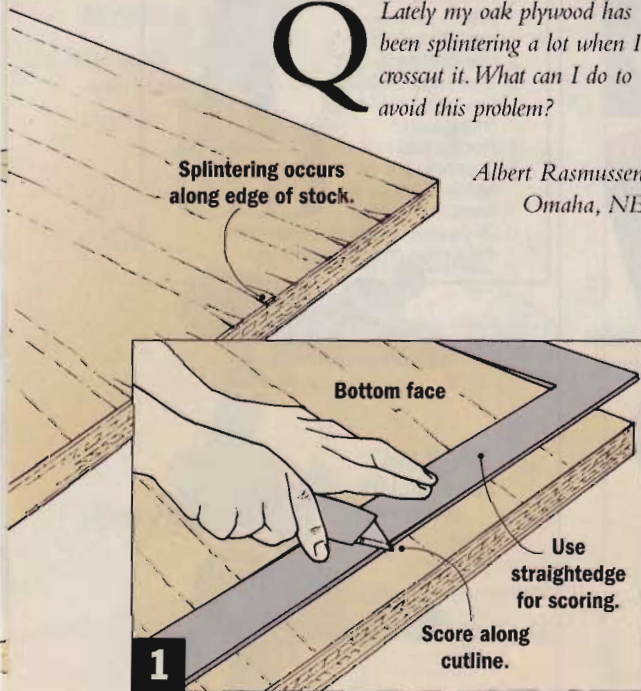
If you cut a lot of plywood or want a blade that's going to remain sharp a long time, spend your money on a carbide-tipped blade. For \$50-\$100, you can get a 10-inch crosscut blade with 80 teeth.

If you don't expect to be cutting a lot of plywood, you might want to consider a steel (not carbide-tipped) plywood blade. I recently paid \$20 for a 10-inch one with 200 fine bevel-ground teeth. It gives me almost splinter-free cuts everytime.

There are a few things you can do to help avoid splintering even with a standard combination blade if you just have to make a couple cuts.

Tearout occurs on the bottom of the stock when using a table saw, so always place the good side (face that will show) up when cutting. When both sides will show in a finished project, try scoring the stock first as shown in *Figure 1*. Then cover the cutline with masking tape (see *Figure 2*). Sometimes holding the individual wood fibers together with tape is enough to prevent them from splintering as the blade passes through the stock.

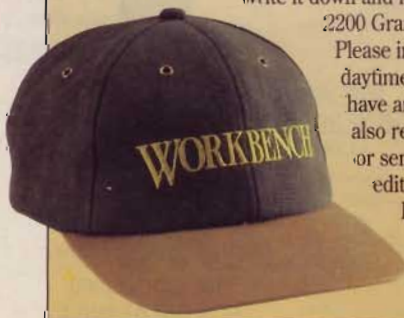
Sometimes I make the score with my saw blade instead of a knife. That way it's easier to line up the cuts. To score, set the blade just high enough to break the thin veneer layer, see *Figure 3*. Then raise the blade slightly higher than the stock and finish the cut on the second pass as shown in *Figure 4*.



SHARE YOUR QUESTIONS!

If you have a question about woodworking or home improvement, write it down and mail it to WORKBENCH Q&A, 2200 Grand Ave., Des Moines, IA 50312. Please include your name, address and daytime phone number in case we have any questions for you. You can also reach us via Fax at (515) 283-2003 or send us an e-mail message at editor@WorkbenchMagazine.com.

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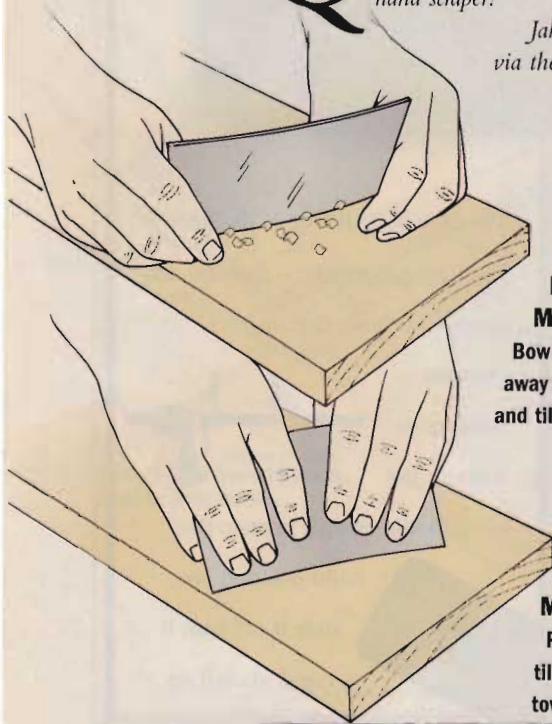
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Should You Push or Pull a Hand Scraper?

Q Does it make any difference whether you push or pull a hand scraper?

Jake Austin
via the Internet



PUSH METHOD
Bow scraper
away from you
and tilt forward.

PULL METHOD
Flex and
tilt scraper
toward you.

A Before discussing pushing or pulling, let me start by talking about scrapers in general. A hand scraper is simply a small thin piece of tempered steel with a burr along one edge. It's often the first tool I choose to remove burn marks, mill marks, and scratches.

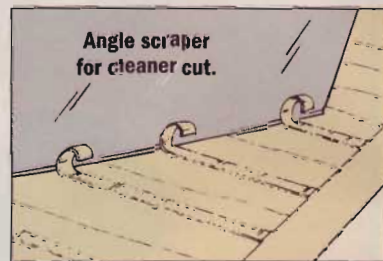
And don't let the name fool you. A scraper slices fine ribbon-like shavings similar to a plane rather than scraping up sawdust.

As for how to use a scraper, there aren't any rules. Hold it between your thumbs and forefingers at an angle of about 50 to 70 degrees or until you feel the burr on the scraper edge catch. Then push or pull it, depending on what feels best.

Pushing a scraper allows you to use your body weight, which helps remove more stock quickly. I also

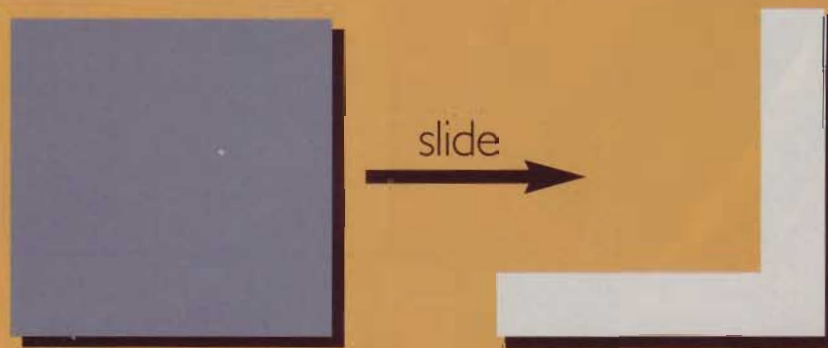
find it easier to keep a scraper flexed to a uniform bow when pushing. On the other hand, I like the control pulling gives me because I can remove thinner shavings. Either way, find what's comfortable for you.

One final trick I use when removing mill marks is to "skew" the scraper at a slight angle to the washboardlike rows. Take a look at the illustration below and you'll see why. Skewing allows the scraper to cut off the ridges rather than dip in and out of the hollows.



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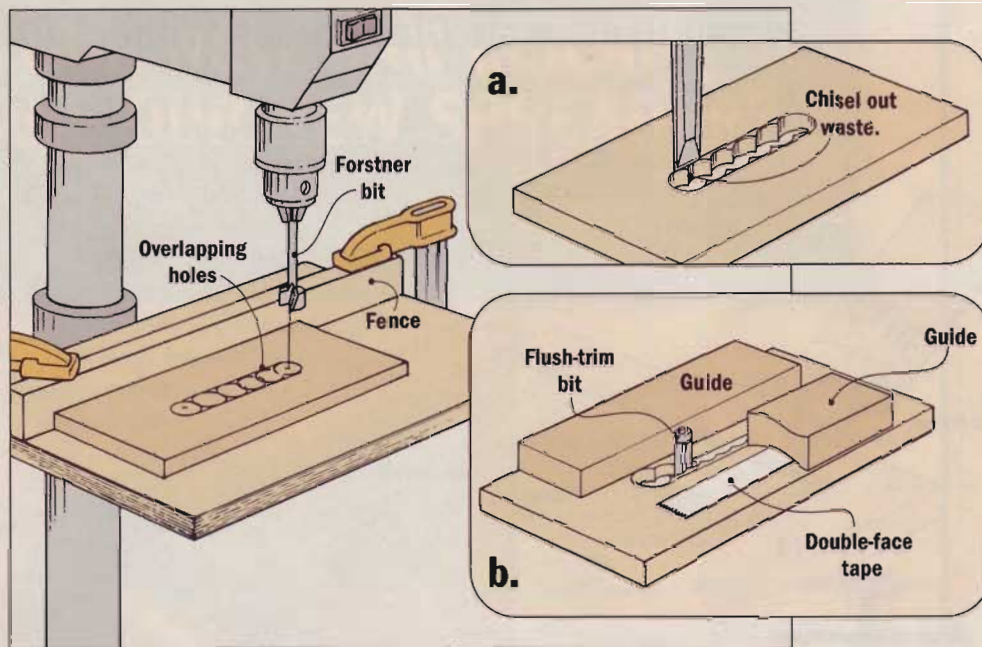
Two More Ways To Cut Slots

There's more than one way to cut wide slots for handles or access holes. In the *Sharpening Store-All* and the *Bathroom Cabinet*, we used a drill bit and jig saw. Here are two more methods that use different tools.

With both methods, the first step is to lay out the centerpoints for the radiused ends and mark the straight sides of the slots. You'll need these layout marks to trim the sides.

Next, align the workpiece under the bit and set the fence on your drill press. Drill the hole at each end of the slot, then use a Forstner bit to drill a series of slightly overlapping holes to connect the two end holes.

The first way to finish the slot is to trim the scalloped waste along the sides with a chisel (*Detail a*). Hold the chisel vertically with the flat edge along the side marks.



The second method uses a table-mounted router with flush-trim router bit to clean up the waste (*Detail b*). Start by attaching wooden edge guides along the sides of

the slot with double-face tape. Set the slot over the bit, and with the bearing riding against the guides, trim the sides smooth. Keep the bit away from the ends of the slot.

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Install Removable Glass Stops Without Driving Nails

When you build a cabinet with glass doors, you probably don't plan on having to replace the glass. But as we all know, accidents do happen. That's why most glass is

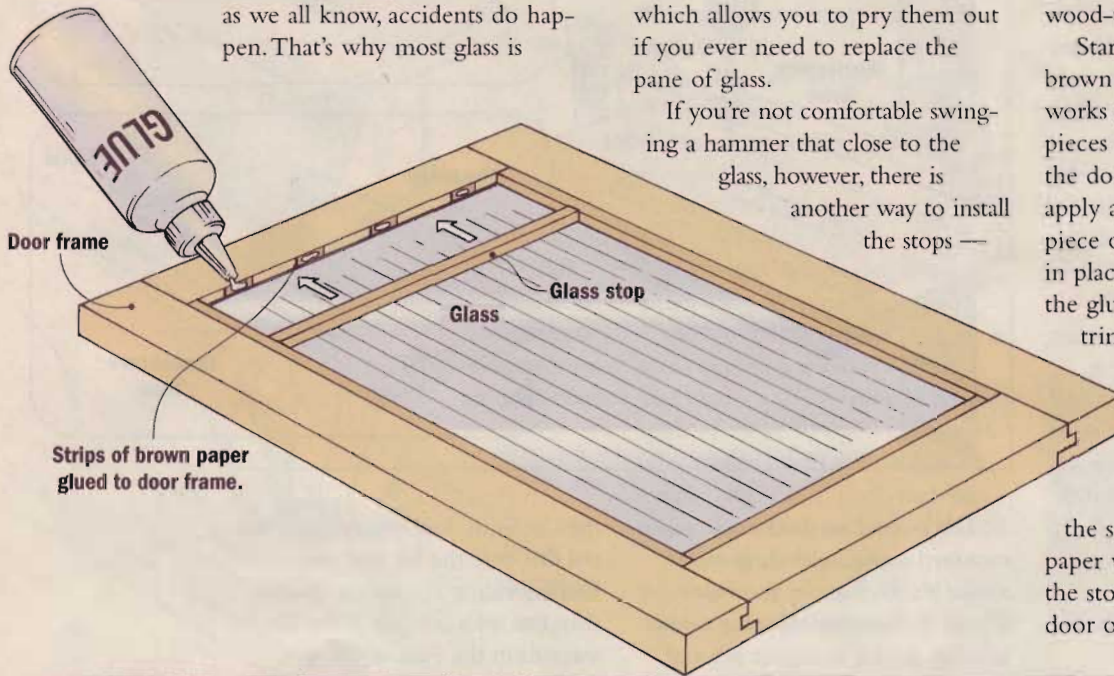
held in place with thin, wood strips called glass stops. These are usually tacked in place with small brads which allows you to pry them out if you ever need to replace the pane of glass.

If you're not comfortable swinging a hammer that close to the glass, however, there is another way to install the stops —

and still be able to remove them later. Instead of brads, the strips are glued in. The secret is avoiding a wood-to-wood glue joint.

Start by cutting a thin strip of brown paper — a grocery sack works great — and glue 1" long pieces of it along the inside edge of the door frame. Insert the glass, and apply a small dab of glue to each piece of paper. Then glue the stops in place against the paper. Once the glue dries, use a razor blade to trim any excess paper sticking up from the joint.

If you need to remove the stops later, simply insert a razor knife between the door frame and the stop and pry the stop off. The paper will split so you can remove the stops without damaging the door or the stops.



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Safe Methods to Avoid Kickback When Crosscutting and Dadoing

Q *I'm just getting started in woodworking and recently bought my first table saw. While reading the manual, I noticed it says you should never use the rip fence and miter gauge at the same time. Why is this?*

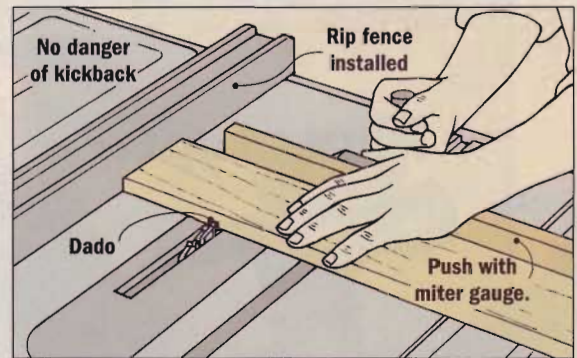
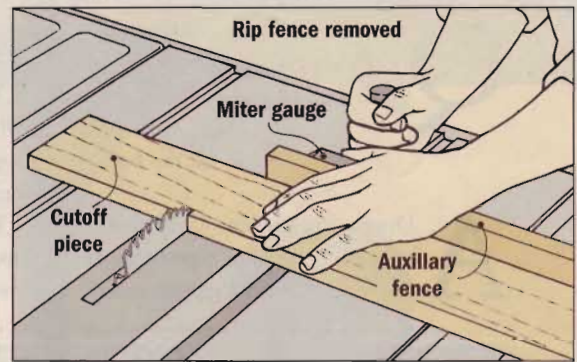
Mark Wilson
Chicago, IL

A Tool manufacturers are rightfully concerned about your safety. But what the manual should really say is: You shouldn't use a rip fence and a miter gauge at the same time when you're cutting *completely through* a board (crosscutting). If you do, you're asking for trouble. Here's why.

When the cut is complete, the cut-off piece will be trapped between the fence and the blade.

There's a good chance it will kick back at you because there's nothing to push it past the blade. Now take a look at the top drawing at right. It demonstrates the correct procedure for crosscutting using a miter gauge to push the workpiece past the blade. Notice the rip fence has been removed to avoid any chance of the cutoff piece binding and kicking back.

However, this doesn't mean you can't ever use both the rip fence and miter gauge at the same time. I do it all the time when I'm not cutting completely through a piece of stock. For example, when cutting dados, rabbets, and tenons, you can use the fence as a stop. You'll notice in the bottom drawing that the board stays in one piece so nothing kicks back. So it's okay to use a rip fence.



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Wayne, NJ



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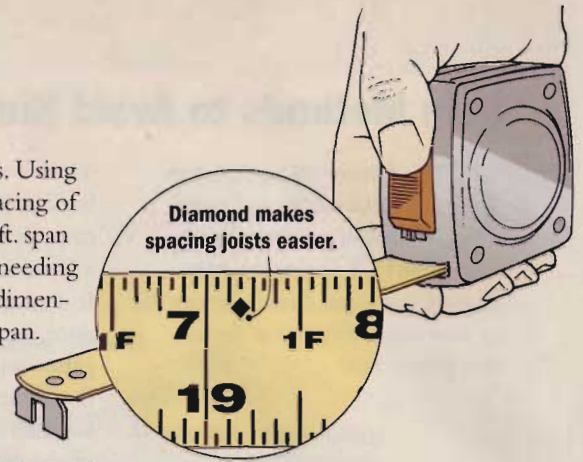
Q Can you tell me what the little diamonds on my tape measure are used for?

Mike Beam
via the Internet

A Diamonds at every 19.2" first appeared on some tape measures as a way to assist carpenters in

laying out I-joists for floor trusses. Using engineered lumber and a joist spacing of 19.2", carpenters can cover an 8-ft. span with five joists — as opposed to needing six joists with 16" spacing using dimensional lumber for the same 8-ft. span.

The diamonds were such a good idea, they now appear on almost all tape measures made.





Prototype



New!



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Removing Burn Marks from Cherry

Q How can I remove burn marks left in cherry when I rout? I'm using sharp bits and minimum cut depths. But I still get burn marks when routing edge profiles. Any ideas?

Doug Warren
via the Internet

A It sounds like you're already doing some of the things necessary to avoid burn marks when routing: using sharp bits and making shallow cuts. If your router has a speed control, you might also want to try using a slower speed or a faster feed rate. Burn marks are usually the result of feeding the stock too slowly.

Unfortunately, sometimes burn marks are inevitable in cherry because of its high resin content and its grain consistency. But don't despair. With a little care, you can remove the burn marks.

First, I suggest you use a sharp hand scraper instead of sandpaper whenever possible. A scraper removes the burns much quicker. You can get both flat and contoured scrapers from woodworking supply stores and catalogs.

An important step in removing the marks is to apply mineral spirits to the burned area just before you get ready to scrape. The mineral spirits will soften the glazing and make it come up more easily.

Tips & Techniques

FEATURED TIP

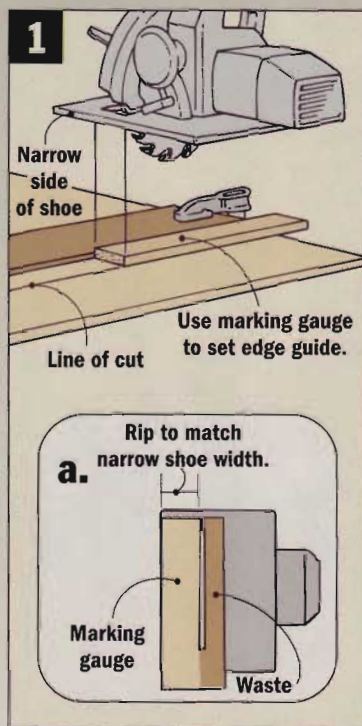
Circular Saw Marking Gauge

Making a straight-line cut with a circular saw usually requires careful measuring to set up an edge guide. While you may have the measurement on the wide side of the shoe memorized, there are times it's convenient to cut with the narrow part of the shoe against the guide.

Thanks to a simple marking gauge, I can lay out a cut either way in seconds. To make the gauge, I start with a piece of $\frac{3}{4}$ "-thick stock and rip it to a width that matches the distance from the blade to the narrow side edge of the shoe (Fig. 1a).

Then I crosscut the piece so its length is equal to the distance from the blade to the wide side of the shoe (Fig. 2a).

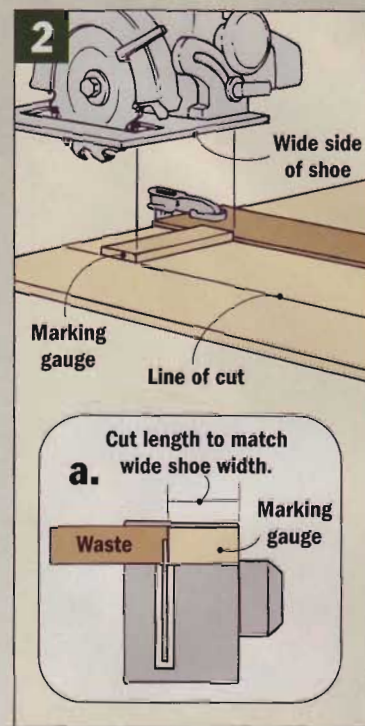
To use the gauge, I measure and mark my workpiece where it's to be cut. If I plan to use the narrow portion of the shoe, I lay the marking gauge parallel to the line of cut (Fig. 1).



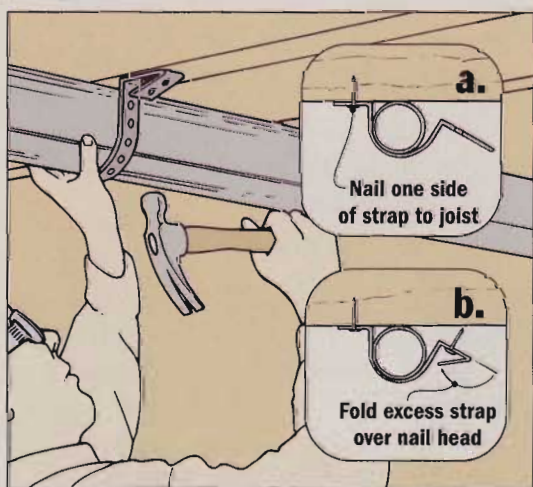
shoe, I lay the gauge perpendicular to the line of cut (Fig. 2).

The gauge gives me the exact spacing between the edge of the shoe and the blade.

*Mike Galecki
Charlotte, NC*



Congratulations to Mike Galecki for submitting this issue's Featured Tip. In recognition of his tip, Mike will receive \$250 worth of tools from The Stanley Works.



Strapped for a Better Nail Holder

Hanging pipes in a confined space is difficult enough without having to fumble around trying to hold the pipe and the plumber's hanger strap steady while you nail the strap down. While hanging some 4"-dia. duct in the crawlspace under my house, I found an easier way.

I start by nailing one end of the hanger strap to a joist and position the pipe to determine the length of strap needed (Detail a). Then I cut

the strap a couple of inches longer than that. After inserting a nail through the proper hole in the strap, I fold the extra strap back against itself so it covers the nail head (Detail b).

That way, I can push the pipe into place with one hand and hammer the nail with the other hand while the strap holds the nail for me.

*Darrell Hampton
Crawfordsville, IN*

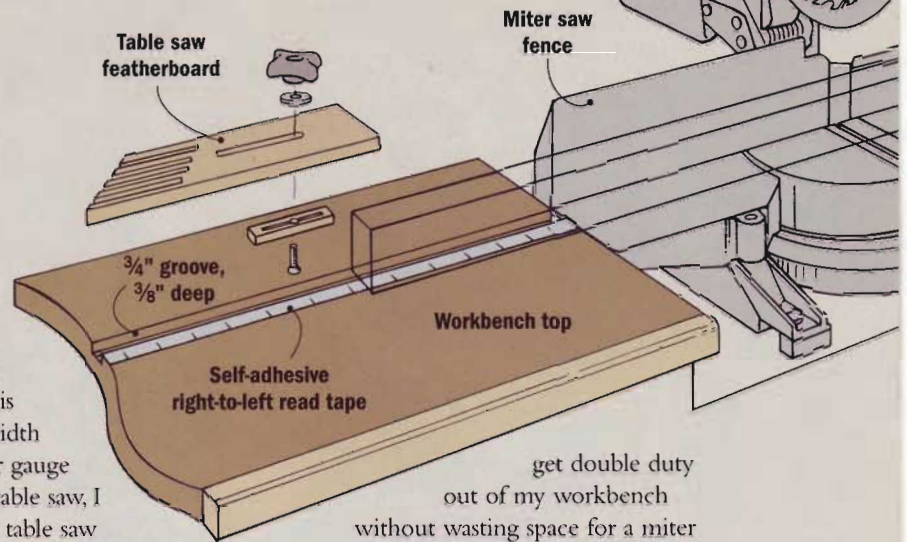
Slotted Bench Top Holds Miter Saw Stop

I have a small shop so I didn't really have room to set up a dedicated stand for my miter saw with long support tables and fences sticking out on both sides. As I considered the problem, I realized what I mainly needed was support for long workpieces and some type of stop block so I could cut multiple pieces to the exact same length.

To solve the problem, I started by routing a $\frac{3}{4}$ "-wide groove, $\frac{3}{8}$ "-deep in the top of my bench. The forward edge of the groove aligns with the miter saw's fence.

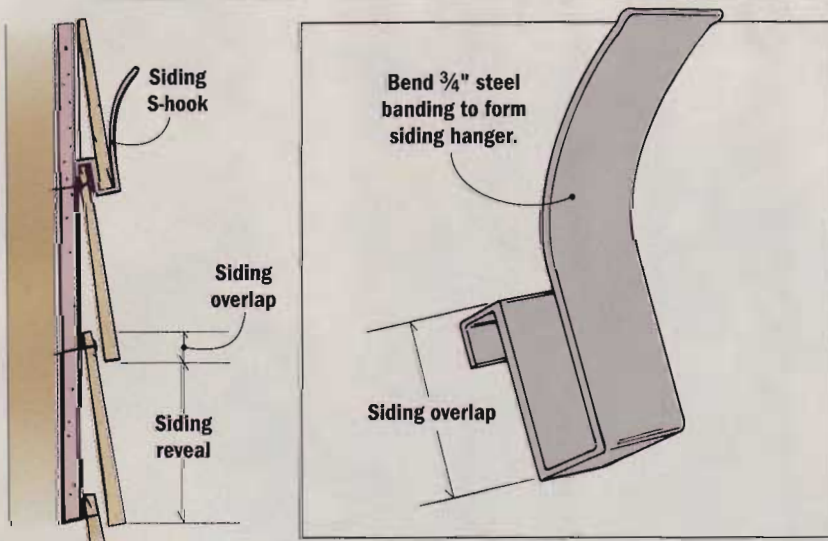
Next to the groove, I attached a self-adhesive, right-to-left reading tape rule and indexed it off the saw blade.

Because the groove is the same width as the miter gauge slot in my table saw, I can use my table saw featherboard as a stop. Using the rule, I align the end of the featherboard at the proper distance and tighten it down. Then I can cut boards to the same length. I



get double duty out of my workbench without wasting space for a miter saw stand. And when I'm working, I don't even notice the shallow groove in my bench.

Larry Niehus
Sioux City, Iowa



Another Twist on Hanging Siding

I liked the tip by Allen Olson for positioning siding in the Jan/Feb issue. He nailed J-hooks to the sheathing to support the siding until it could be nailed in place. I used a similar technique that doesn't require attaching the hooks.

The siding I was installing came bundled with $\frac{3}{4}$ "-wide steel strapping. I cut a couple of short pieces of strapping and bent them in an S-shape so the distance between the bends was equal to the overlap of the siding I was installing (see the

illustration). I made one tail of the 'S' short and the other long.

To use my hooks, I slip them over the top of the last piece of siding installed. When I set the next piece of siding in place in the hook's other notch, the siding is automatically registered with the correct reveal. After driving nails near each end and the middle, I give the hooks a twist and slip them out. Then I finish nailing down the siding.

Paul Pruitt
Canton, TX

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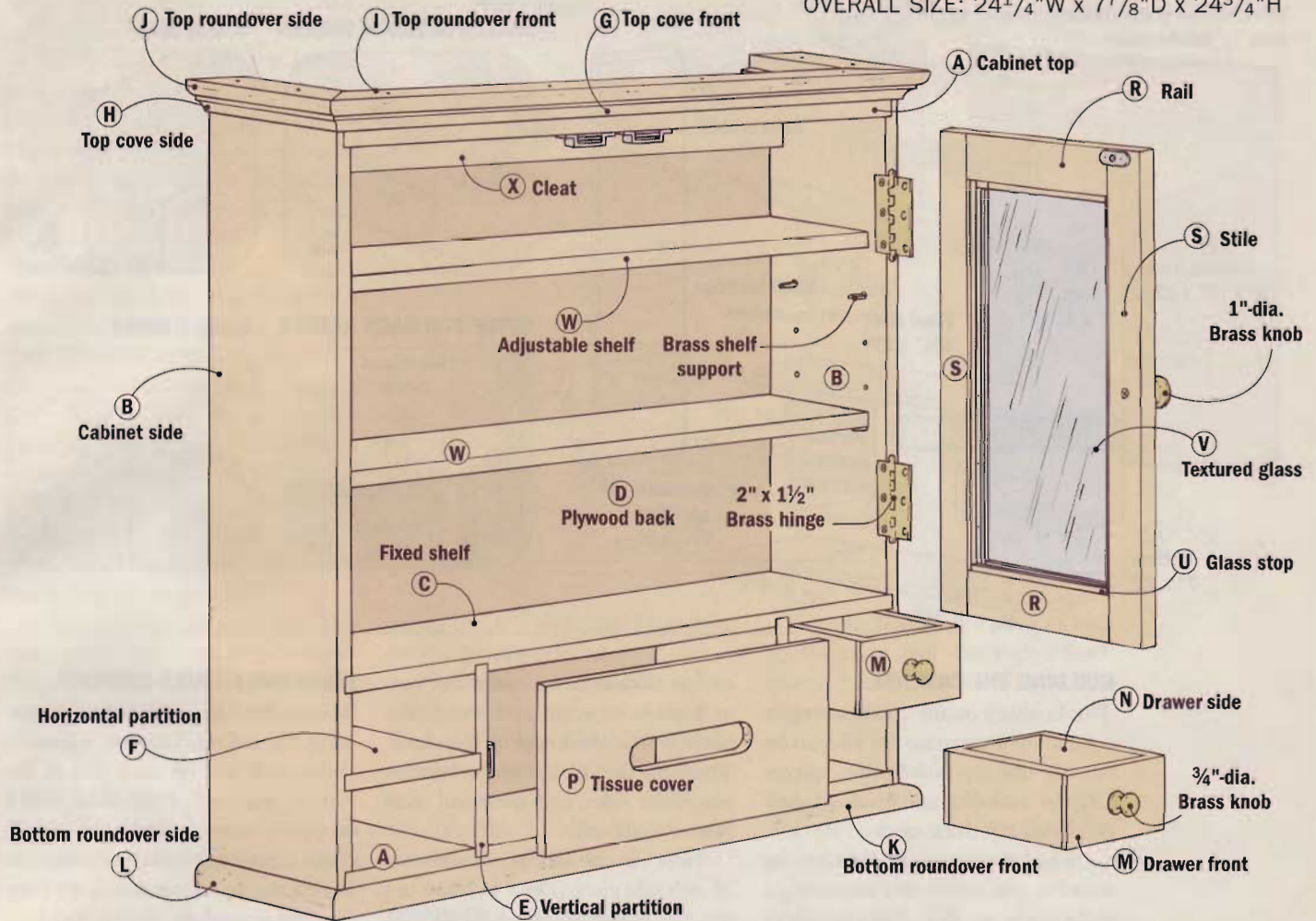
Classic Cherry Cabinet

Small bathrooms mean small storage spaces. But that doesn't mean you have to settle for a cluttered vanity. This curio-style cabinet keeps bathroom items close at hand, but out of sight.



BATHROOM CABINET EXPLODED VIEW

OVERALL SIZE: 24¹/₄"W x 7⁷/₈"D x 24³/₄"H



All bathrooms suffer from the same problem — they never have enough storage space. And it's always hard to make more storage space without it looking like, well, storage space. Here's a cabinet that solves that problem pretty well. It's as decorative as it is functional, and it's designed to fit in that space above the toilet that's wasted in many bathrooms.

This same design works well in a variety of finishes, too. I built the one pictured here in cherry and used brass hardware and textured glass for a classic look. Then I built a second one in poplar and gave it an antique look. That cabinet is pictured on page 39.

Either way, this is a great project to make some much-needed room and polish up (or pick up) some cabinetry skills along the way.

MATERIALS LIST

CARCASE:

- A (2) Cabinet Top/Bottom 1/2" x 7" x 22"
- B (2) Cabinet Sides 1/2" x 7" x 23"
- C (1) Fixed Shelf 1/2" x 6³/₄" x 22"
- D (1) Plywood Back 1/4" x 22" x 22¹/₂"*
- E (2) Vertical Partitions 1/2" x 6³/₄" x 6"
- F (2) Horizontal Partitions 1/2" x 5" x 6³/₄"*

MOLDING:

- G (1) Top Cove Front 1/2" x 2" x 23¹/₂"*
- H (2) Top Cove Sides 1/2" x 2" x 7¹/₂"*
- I (1) Top Roundover Front 1/2" x 2" x 24¹/₂"*
- J (2) Top Roundover Sides 1/2" x 2" x 7⁷/₈"*
- K (1) Bottom Roundover Front 1/2" x 2" x 23¹/₂"*
- L (2) Bottom Roundover Sides 1/2" x 2" x 7¹/₂"*

DRAWERS AND TISSUE COVER:

- M (8) Drawer Fronts/Backs 1/2" x 2⁷/₁₆" x 4³/₈"*
- N (8) Drawer Sides 1/2" x 2⁷/₁₆" x 6¹/₄"*
- O (4) Plywood Bottoms 1/4" x 3⁷/₈" x 6¹/₄"*
- P (1) Tissue Cover 1/2" x 5³/₈" x 11³/₈"*
- Q (2) Tissue Cover Stop Tabs 1/4" x 1/4" x 1/2"

*These dimensions should be used as guidelines only. Cut your actual pieces to fit.

DOORS AND SHELVES:

- R (4) Rails 3/4" x 1³/₄" x 8¹/₄"**
- S (4) Stiles 3/4" x 1³/₄" x 16"
- T (4) Filler Strips 1/4" x 1/4" x 13"
- U Glass Stop 1/4" x 1/4" x 64" total*
- V (2) Textured Glass Panels 1/8" x 7⁵/₈" x 12⁷/₈"*
- W (2) Adjustable Shelves 1/2" x 5³/₄" x 21¹/₄"*
- X (1) Cleat 3/4" x 1¹/₂" x 21¹/₂"*

HARDWARE:

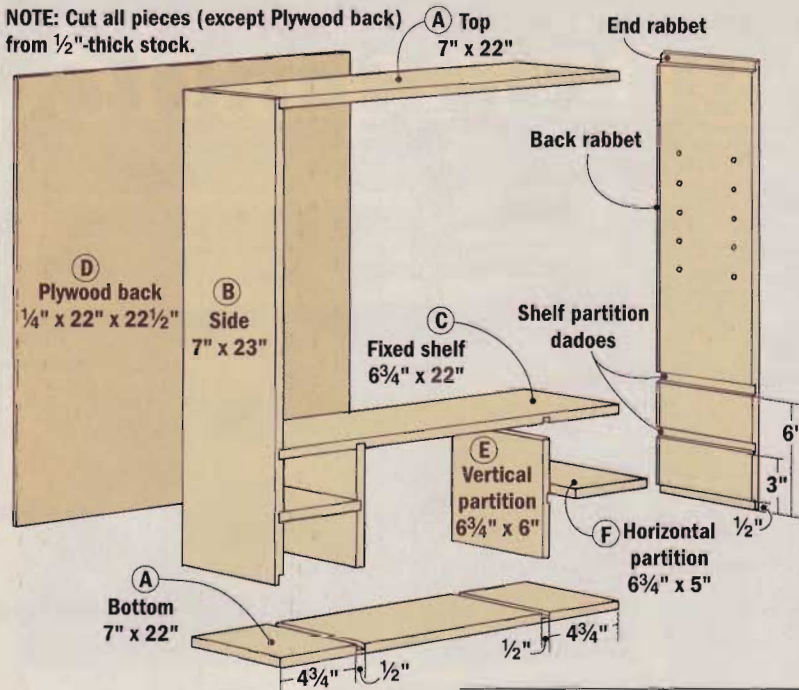
- (4) Magnetic catches (brown)
- (4) 2" x 1¹/₂" Brass hinges w/ finials
- (24) #4 x 3/8" Brass screws (to mount hinges)
- (2) 1"-dia. Brass knobs (w/backplates)
- (4) 3/4"-dia. Brass knobs (w/backplates)
- (8) Brass shelf supports (spoon type)
- (16) #8 x 3/4" Fh woodscrews
- (8) #8 x 1" Fh woodscrews
- (12) 2d Finish nails (to nail plywood back)

CUTTING DIAGRAMS:

Turn to page 80 for information about obtaining cutting diagrams for this project.

CARCASE EXPLODED VIEW

NOTE: Cut all pieces (except Plywood back) from 1/2"-thick stock.



BUILDING THE CARCASE

The first step in any cabinet project is building the carcass. So I began by cutting the top and bottom pieces (A), the sides (B), and the fixed shelf (C) from 1/2"-thick stock.

When that's done, it's time to start the carcass joinery by setting a dado blade up to match the thickness of the carcass pieces (see *Carcass Joinery Details* above). And by the way, don't assume that the 1/2"-thick stock you bought is really 1/2"-thick. It's probably a little more

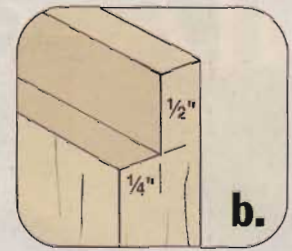
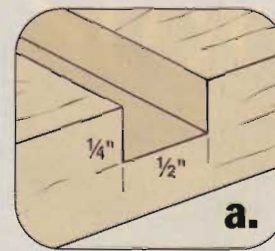
or less than that. So make test cuts in a piece of scrap and match the blade to the thickness of the stock. Then cut the dadoes in the bottom piece, the sides, and the fixed shelf (*Detail a*, above).

Now cut the rabbets on the ends of each side piece (*Detail b*). Make test cuts like before to make sure the rabbets match the thickness of the stock.

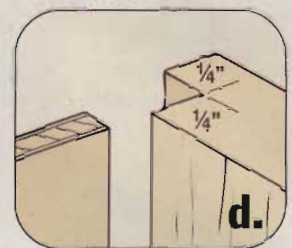
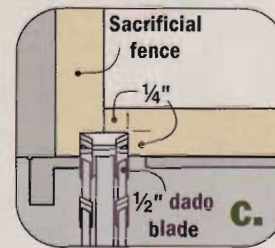
Next, bury part of the dado blade in a sacrificial fence (*Detail c*). And rabbet the cabinet sides, top, and bottom for the plywood back (*Detail d*).

CARCASE JOINERY DETAILS

SHELF/PARTITION DADOES END RABBET



SETUP FOR BACK RABBET BACK RABBET



ADJUSTABLE SHELF SUPPORT

There's one last detail before assembling the carcass. The two adjustable shelves will rest on shelf pins in the cabinet sides, so you need to drill a bunch of evenly-spaced holes for the pins. Consistency is important here, so I used the jig shown below to keep everything lined up.

ASSEMBLING THE CABINET

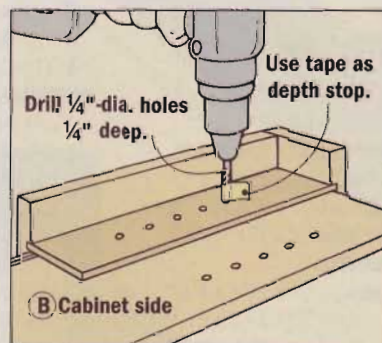
In the *Cabinet Assembly Sequence* on the next page, you can see the steps I followed to put the cabinet

DRILLING SHELF SUPPORT HOLES USING A SHOP-BUILT JIG

To build a shelf pin jig, cut a centered groove in some 3/4"-thick stock and construct an L-shaped bracket. Then glue a 1/4"-thick piece of plywood into the bracket.

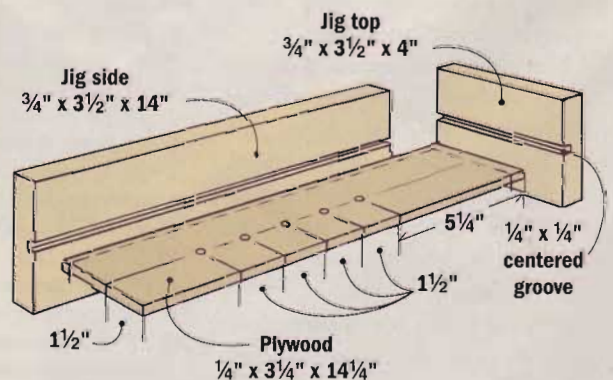
Now lay out the hole locations on the plywood according to the dimensions in the *Jig Exploded View*. Drill a 1/4"-dia. hole through the plywood at each layout location.

Line the bracket up at the top of each cabinet side and drill holes 1/4" deep into each piece.



Then flip the jig over and line it up on the other edge of the side piece to drill the second set of holes.

JIG EXPLODED VIEW



together. From the illustrations, it may look like I cut all the partition pieces to size and then started assembling them. But what I really did was cut the parts for each step as I went along. By doing it that way, you can cut each piece to fit perfectly into the cabinet.

In *Step 1*, you can see the carcass assembled with the plywood back in place. To do this, start by clamping the carcass together facedown without gluing it. Then, measure between the back rabbets and cut the plywood back to fit (*D*). Now, remove the clamps and spread glue in all the rabbets. Then assemble the carcass and clamp around it. Finally, use some small nails to hold the back in place. The back will help square up the carcass.

With the cabinet lying on its back, you're ready to add the fixed shelf (*C*) (*Step 2*). Test-fit the shelf before gluing it. The front edge of the shelf should be flush with the front of the cabinet, and the back edge should butt against the plywood back. Make sure it slides in easily enough, too. You don't want to be fighting it into place after the glue is spread.

When you're ready to glue the shelf in, don't spread glue inside the dado like you normally would. Most of the glue would get pushed out when you slide the shelf in and make a big mess. Instead, put a small glob of glue at the front of the dado and let the shelf spread it as it's inserted (see the photo above). You'll still get some glue squeeze-out this way, but not nearly as much.

Now that the fixed shelf is glued and clamped in place, you can measure for the vertical partitions (*E*). Measure between the dados on the fixed shelf and the dados on the bottom piece to find the length. Then, measure the depth of the cabinet to find the partition's width. There probably won't be much difference, but it's a good idea to measure for both partitions, just to be sure.

Next, cut the vertical partitions to size and slide them into the cabinet

temporarily. While they're in there, lay a straightedge across the width of the cabinet and line it up with the dado in each side piece (see the straightedge in *Step 3*). Now, transfer the dado locations onto the front edge of the partitions and use the marks as a gauge to set up your table saw. After dading the vertical partitions, glue and clamp them into the assembly.

Then, measure for the horizontal partitions (*F*) and cut them to size.

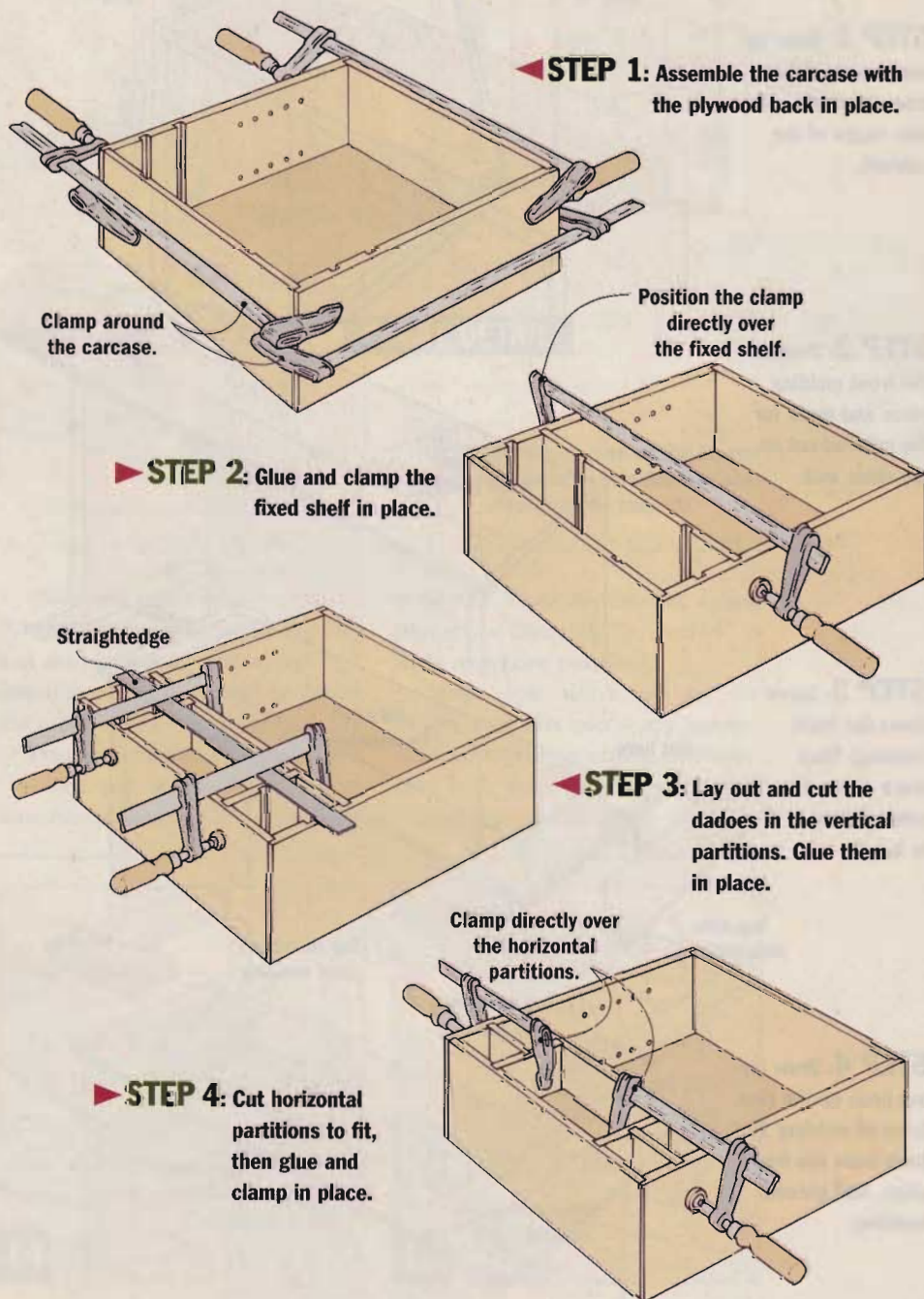
Glue them into the cabinet just like the other pieces (think "glob") and clamp them while the glue sets up (*Step 4*).

When the glue has dried, remove the clamps. Scrape off any glue that might have squeezed out and stand the cabinet upright. Now you're ready to add the trim.



Put a glob of glue at the front of the dado and let the mating board spread the glue as it's inserted.

CABINET ASSEMBLY SEQUENCE



ROUTING AND APPLYING CABINET TRIM

SHOP-MADE MOLDING

Take a look back at the picture of the cabinet on page 30. Now imagine what it would look like without the molding on the top and bottom.

It would be kind of plain-looking, wouldn't it? Interesting that something so simple can add so much character to a project.

The top molding may look like it requires a fancy router bit, but the trick is to make it in two pieces. By combining the top cove molding (G&H), with the top roundover molding (I&J), you get an ogee profile that looks like it came right off the shaper (*Two-Piece Ogee Trim*). The bottom roundover molding (K&L) is even simpler — just a 1/4"-thick piece of stock with a 3/8" roundover on one edge (see the exploded view on page 31).

All you need to make the molding is a handheld router and two common router bits (see *Details a* and *b*, above). Start by cutting a 2" x 4-ft. long blank for each molding type.

NOTE: The top molding pieces are made from 1/2"-thick stock. The bottom molding piece is made from 1/4"-thick stock.

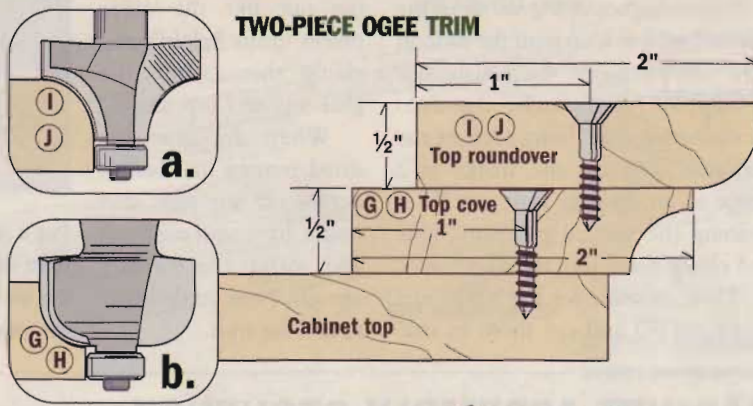
Now rout a roundover on the 1/4"-thick bottom molding and one of the 1/2"-thick top molding pieces. Rout a cove in the other 1/2"-thick blank.

APPLYING THE MOLDING

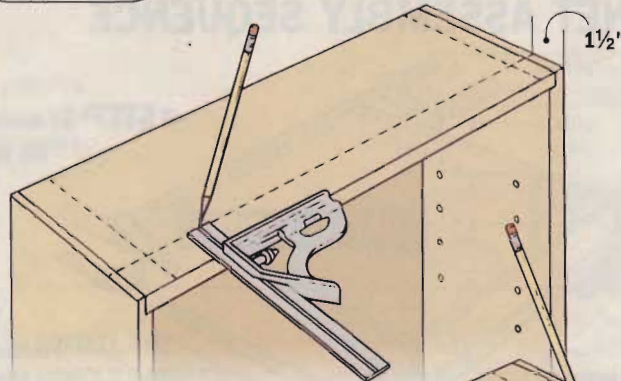
Once the routing is done, you can begin applying the molding to the cabinet. Start on the top and draw layout lines as shown in *Step 1*. Then miter one end of the top cove molding (G) and position it on the cabinet. The rear edge of the molding should be on the layout line and the back corner of the miter should be at the intersection of the pencil lines (*Step 2*). Now attach the front piece of molding with 1/4" woodscrews.

Next, cut extra-long pieces for the side molding and miter one end of each piece. Position the side pieces on the cabinet, mark them on the back edge, and cut them to length (*Step 3*). Then attach the side pieces with screws.

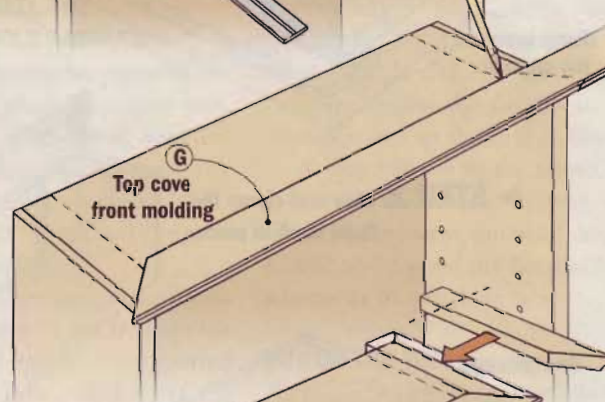
Finally, apply the second layer of



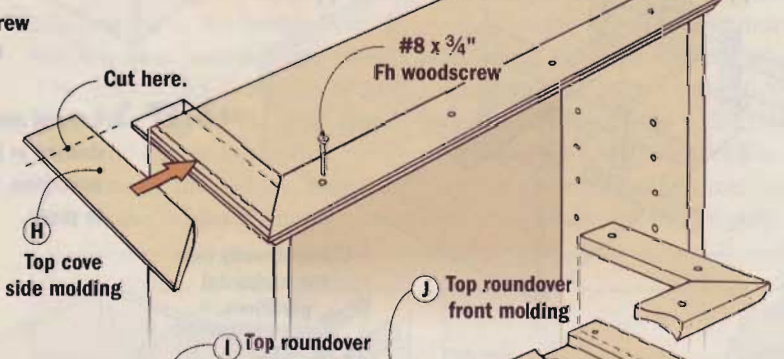
STEP 1: Draw layout lines 1 1/2" back from the front and side edges of the cabinet.



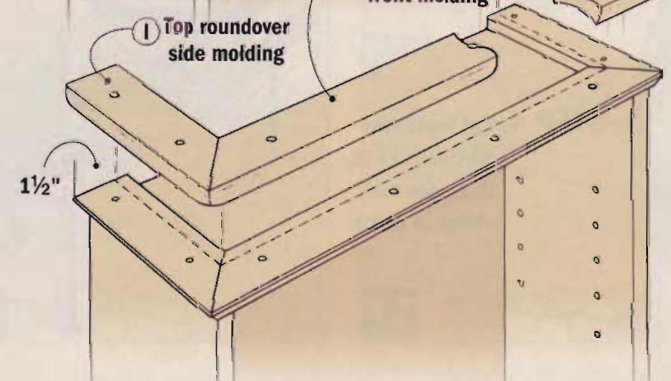
STEP 2: Position the front molding piece and mark for the mitered cut on the other end.



STEP 3: Screw down the front molding. Then mark and cut side molding to length.



STEP 4: Draw layout lines on the first layer of molding 1 1/2" back from the front edge. Add second molding.



molding as shown in *Step 4*. Then turn the cabinet over and trim the bottom by repeating *Steps 1* through *3*.

DRAWER CONSTRUCTION

Now that the carcass is completely assembled, you can start custom fitting the four small drawers.

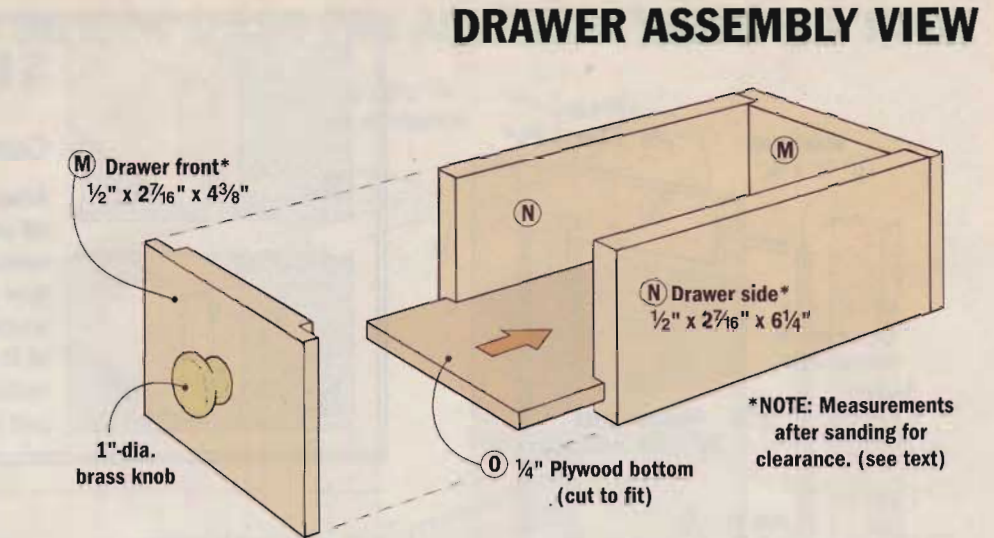
The first thing to do is measure the height, width, and depth of the openings. Then you need to allow for the gap around the drawer (*Detail a*). Without a small gap, the drawer could get stuck.

You could size the drawers by subtracting the size of the gap from the overall dimensions of the opening, but that could be confusing. I handled it by building the drawers to the exact dimensions of the opening and then sanded them to fit. It's a good way to get a perfect fit and it really doesn't require that much sanding.

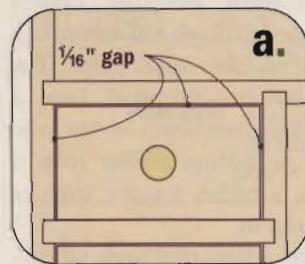
Start by cutting the drawer fronts, backs (M), and sides (N) to size. Then set the table saw up with a dado blade that matches the thickness of the plywood bottom. Cut a groove in all the drawer pieces for the bottom to nest in (*Detail b*).

Now, without changing the blade, cut the rabbets in the drawer fronts and backs in two passes (*Detail c*).

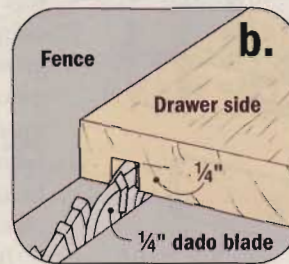
Next, dry-assemble the drawers and measure for the plywood bot-



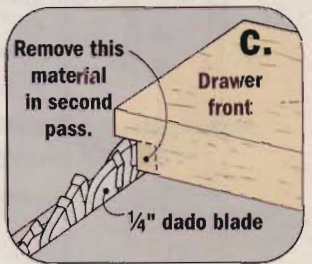
CUSTOM-FIT DRAWER



BOTTOM GROOVE



FRONT AND BACK RABBET



tom (O). Cut the bottoms to fit and glue and clamp the drawers together.

After the glue dries, you can sand the drawers to fit. To do that, tape a sheet of sandpaper to a flat surface (a table saw table is perfect for this).

Then, rub the drawer across the

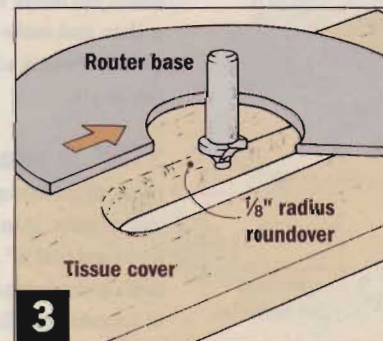
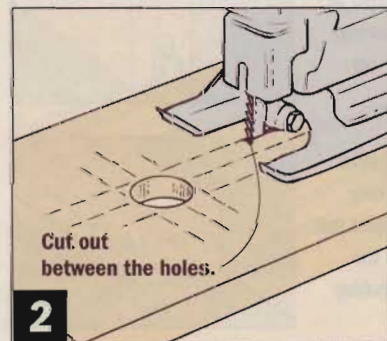
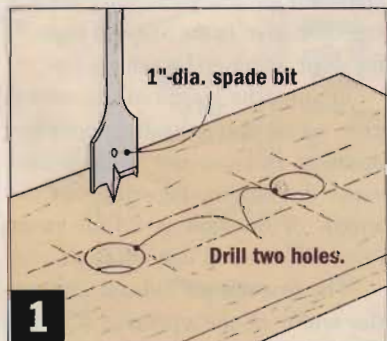
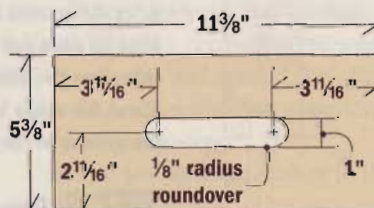
sandpaper, first one side then the other. Check the fit occasionally until you have about a $1/16$ " gap on each side of the drawer. Then sand the top and the bottom alternately to make the same size gap at the top of the drawer.

MAKING THE TISSUE COVER

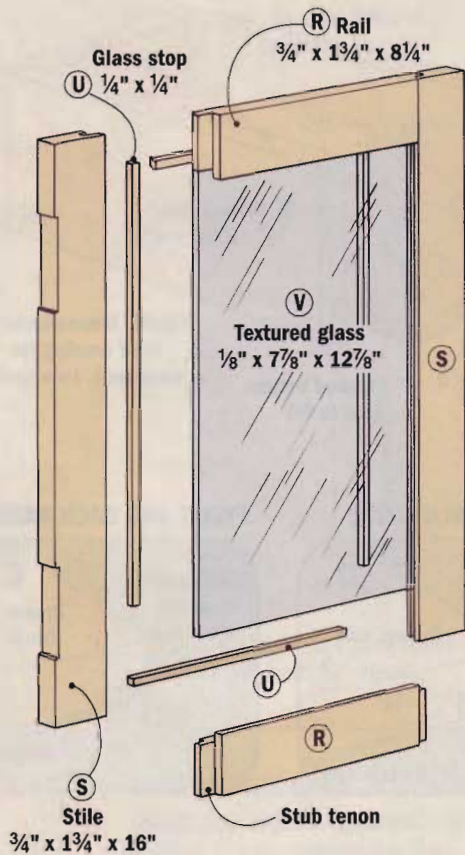
To make the tissue cover (P), cut a piece of $1/2$ "-thick stock to match the size of the opening in the cabinet. Then, lay out the tissue slot following the dimensions in the illustration at right. Next, drill a 1"-dia. hole

for each end of the slot (*Fig. 1*). Then, cut between the holes with a jigsaw (*Fig. 2*).

Finally, ease the edge of the opening with a $1/8$ " roundover bit as shown in *Fig. 3*.

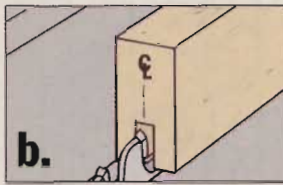


DOOR ASSEMBLY VIEW



SKILL BUILDER

Centering A Groove



Adjust the rip fence so the blade is slightly off center on the edge of your stock. Then make the first cutting pass (Fig. a).

Now flip the board end-for-end and make another pass (Fig. b). Measure the width of the groove. If it's less than 1/4" wide, nudge the fence away from the blade, and make two more passes.

RAIL AND STILE DOORS

The rail and stile doors on this cabinet are small, but they have a unique design. Each rail and stile is grooved on the inside edge. The groove has two purposes. First, it mates with a stub tenon on the rails. Second, by adding a filler strip, it becomes a rabbet for the pane of glass to rest in.

It takes a few steps to do all this, and it may be difficult to understand at first. My advice is to read all the way through this section before starting to work, and then build a

practice set of rails and stiles before going to work on the real thing.

Start by cutting extra-long blanks for the rails (R) and stiles (S). After cutting the blanks, label them "rail" and "stile," and lay them out the way they go together.

Next, using a piece of 3/4"-thick scrap wood, set up to cut the 1/4" x 1/4" groove as shown in the *Skill Builder*.

Then, cut a groove on one edge of each rail and stile. Your pieces should look like those pictured in *Step 1* of the *Door Joinery Sequence*.

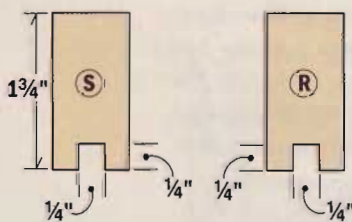
Now raise the saw blade and cut the groove in just the stiles another 1/4" deep (*Step 2*).

Finally, cut one shoulder of each rail and stile as shown in *Step 3*. On the rail, you want to remove the shoulder completely without cutting into the bottom of the groove.

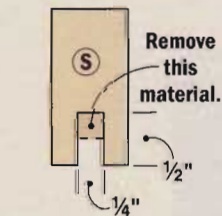
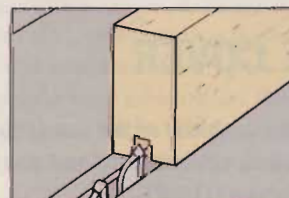
DOOR JOINERY SEQUENCE

STILE

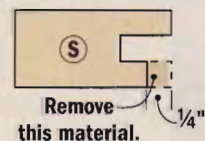
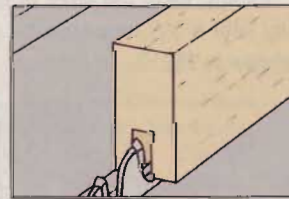
RAIL



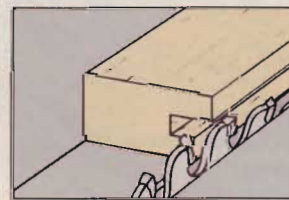
STEP 1: Center a 1/4" x 1/4" groove in one edge of each rail and stile. See the *Skill Builder* above for steps to center the groove in the stock.



STEP 2: Deepen the groove in the stiles only. Raise the blade a little at a time and make several cuts to "sneak up" on the depth.



STEP 3: Set the blade height to cut through only one shoulder. Then adjust the fence and trim 1/4" off the width of the inside shoulder of the rails and stiles.



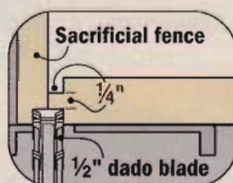
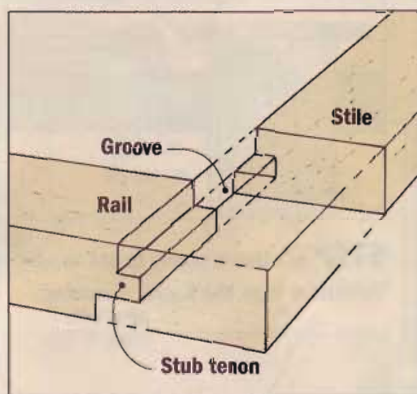
SIZING THE DOOR PARTS

Now you need to figure out what size to build the door before cutting the rails and stiles to length. Start by measuring the cabinet opening (height and width). I like to build the door to those exact dimensions and then trim it to fit after it's put together. (See *In the Shop* on page 70 for door sizing and squaring tips.)

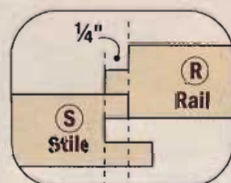
Finding the length of the stiles is easy — measure the height of the opening and cut the stiles to that exact dimension. Figuring out the length of the rails is a little more involved, but still easy enough.

The first thing I did was measure the width of the opening. (On my

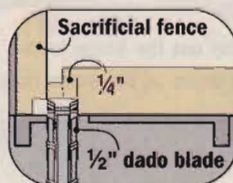
RAIL TENON CUTTING SEQUENCE



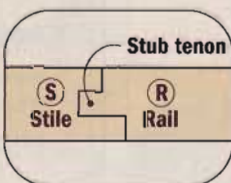
STEP 1: Start by cutting a $\frac{1}{4}$ "-long tenon on the ends of each rail.



STEP 2: Compare and match the tenon to the depth of the groove in the stiles.



STEP 3: Lengthen the cheek on the outside of the tenon on each rail.



STEP 4: Fit the tenon in the groove so there are no gaps in the joint.

cabinet, that was $21\frac{1}{2}$ ".) Then I divided by two (since there are two doors). That meant that each door had to be exactly $10\frac{3}{4}$ "-wide.

Knowing that, I "mocked-up" the door by setting the stiles on the workbench parallel to each other with their outside edges exactly $10\frac{3}{4}$ " apart. Then, I measured from the bottom of one groove to the bottom of the other to find out how long to cut the rails.

STUB TENONS

Once the grooves are all cut and the rails cut to length, you can start cut-

ting the stub tenons. But these aren't typical stub tenons. Take a look at the *Rail Tenon Cutting Sequence* above and notice that the cheeks on each side of the tenon are different lengths. There isn't any special technique to cutting these tenons, just some extra setup steps. So keep a piece of scrap wood handy to make test cuts for each setup before cutting the actual tenon.

In *Step 1*, cut a $\frac{1}{4}$ " x $\frac{1}{4}$ " tenon on the ends of the rails. Then check the length of the tenon by comparing it to a stile as shown in *Step 2*.

Now, finish cutting the $\frac{1}{2}$ " cheek

on the outside of the rail (*Step 3*). Test fit the rails to make sure you've got a joint like the one pictured in *Step 4*.

ASSEMBLING THE DOORS

When the rails and stiles are done, dry-assemble the doors to check the fit and size. Then spread glue on the tenons and inside the grooves and clamp the pieces together.

Before putting the pane of glass in the door, the groove on the stiles needs to be filled. You can see how I did that with wood fillets below. The fillets are also used as glass stops and tissue cover stops.

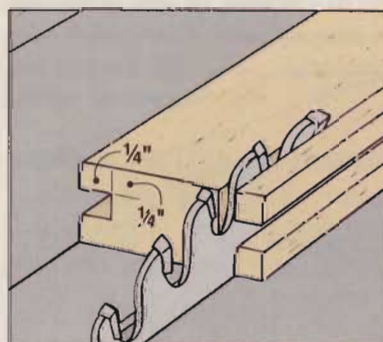
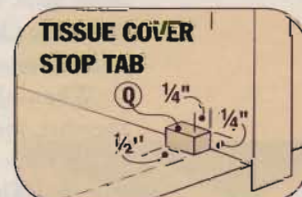
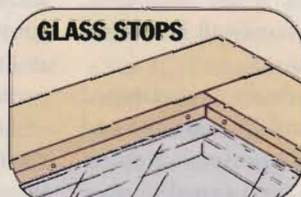
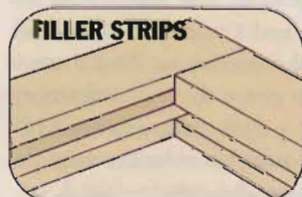
MAKING AND USING WOOD FILLETS

These thin wood fillets have three distinct jobs on the cabinet. First, they're used as *Filler Strips* to fill the groove in the stiles between the rails — which effectively makes a rabbet for the pane of glass to set in.

Second, they act as *Glass Stops* to hold the panes of glass in the doors.

Finally, two small squares of fillet become *Tissue Cover Stop Tabs* when they're cut and glued into the bottom of the facial tissue compartment. These little pieces cure the tissue cover's tendency to rock back and forth on the magnetic catches that hold the cover on.

Make the fillets by cutting a groove centered in a piece of $\frac{3}{4}$ "-thick stock. Then rip the fillets off one edge (as shown at right), adjust the fence, and rip them off the other edge.

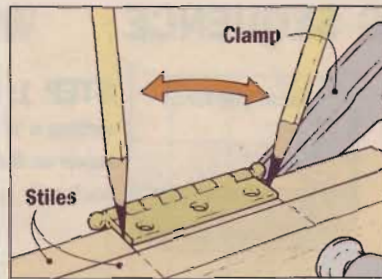
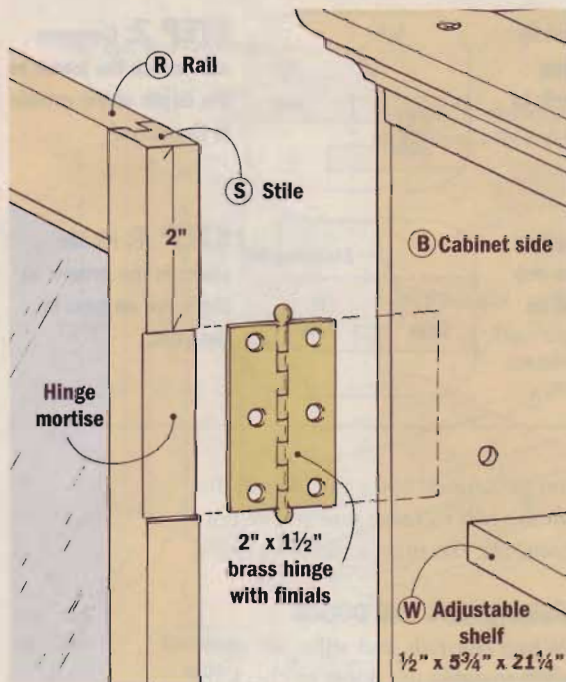


Groove both sides of each piece of stock and to form an "H," then rip the fillets free from the board.

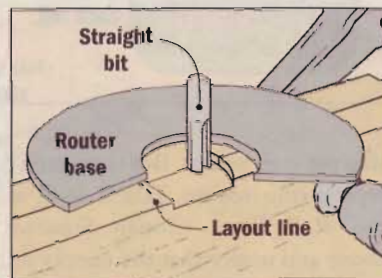
NOTE: The Glass Stops should be nailed — not glued — so they can be removed if the glass ever needs to be replaced.



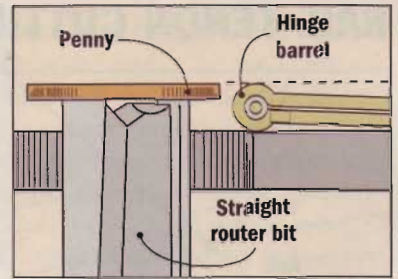
INSTALLING THE HINGES



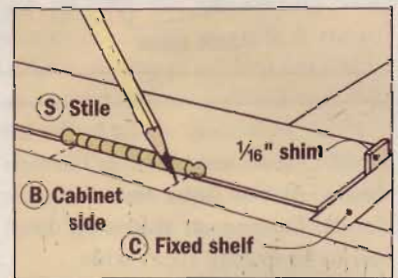
STEP 1: Lay out the hinge locations on both doors at the same time.



STEP 3: Rout the mortises and then square them with a chisel.



STEP 2: Use a penny to set the bit 1/16" lower than the barrel diameter.



STEP 4: Transfer the hinge locations to the cabinet sides.

INSTALLING BUTT HINGES

The cabinet doors operate on butt hinges that are mortised into the stiles but flush mounted to the cabinet (see illustration above). To install the hinges, the first thing to do is lay out their location on the door stiles. You could do each door separately, but it's faster to clamp the doors together face-to-face and get them both done at the same time. The hinge locations will be consistent that way, too.

When the doors are clamped together, measure 2" from one end of the stiles and position a hinge at that spot. Then use a pencil to trace the edges of the hinge onto the

stile (Step 1). Now do the same thing to lay out the hinge location on the other end of the stiles.

The next step is to set up your router to cut the mortises. The depth of the mortise should be 1/16" less than the diameter of the hinge barrel. (Which is the size of the gap between the door and the cabinet side.) That's an awfully close measurement to try and dial-in with just your eye and a ruler. But if you look at Step 2, you can see how I use a penny to gauge the 1/16" difference.

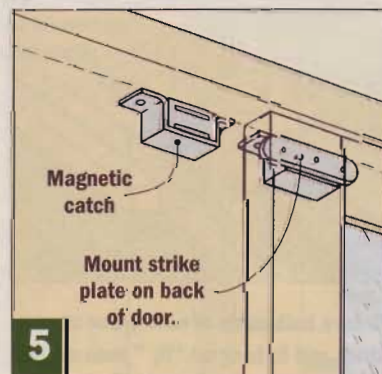
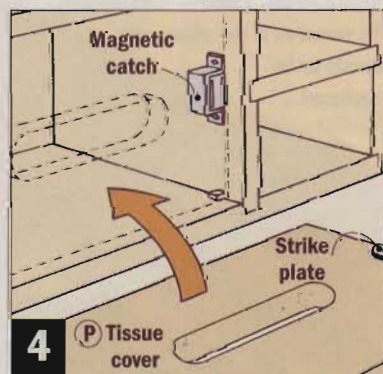
Now, with the doors still clamped together, rout between the layout lines as shown in Step 3.

As you rout, be sure to stay just

inside the pencil lines. Then you can square up the mortises with a chisel.

Next, attach the hinges to the doors. Set each hinge in its mortise with the finials snug against the outside face of the stile. Then attach the hinges with screws.

Finally, position the doors in the opening and transfer the hinge locations to the cabinet (Step 4). Then predrill for the screw holes and attach the hinges temporarily. (By the way, the screws that come with the hinges may be too long for the 1/2"-thick cabinet sides — use 3/8" brass screws instead.) Now remove the hinges so they're out of the way when you're ready to stain the cabinet.



CLOSING DETAILS

There are just a few details left to complete the cabinet. First, make the adjustable shelves (W). I used two shelves in my cabinet, but you might only want one. Size the shelves to fit inside the cabinet with about 1/8" clearance at each end.

Next, add the magnetic catches that hold the doors closed and the tissue cover in place. Alignment isn't super critical here since the catches

are out of sight, but be sure they're mounted far enough inside the cabinet that the doors and the tissue cover set flush with the front edge of the cabinet (Figs. 4 and 5).

Finally, you can attach the cleat (X). This is just a piece of $\frac{3}{4}$ "-thick stock glued into the corner of the plywood back and the cabinet top. It helps reinforce the cabinet for mounting to the wall (see the illustration at right).

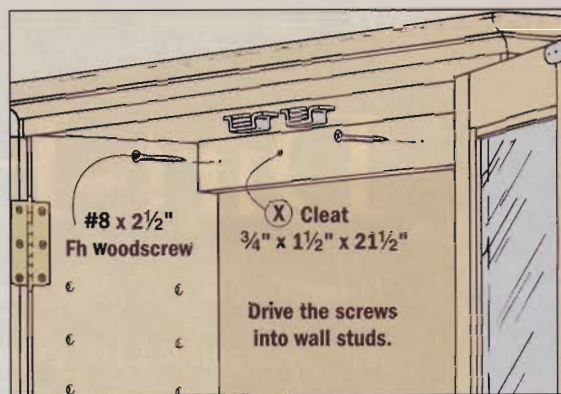
FINISHING TOUCHES

Staining cherry without blotching is always a challenge. The first step (with any finishing technique, really)

is a thorough sanding. I start with 100-grit sandpaper on a palm sander and progress through 120- and 150-grit. Then I hand sand with 180- and 220-grit paper.

For the stain, I mixed two parts Wood Kote Jel'd Stain (cherry) with one part Zar Wood Stain (cherry). (To get it mixed really well, take it to the hardware store and have it shaken. Just be sure to get the lid on tight!)

Apply one coat of the stain mixture with a foam brush and wipe off the excess. Let it dry overnight and then apply a clear finish. I used two coats of semi-gloss polyurethane.



After another night of drying, hang the cabinet as shown above, and fill it with all the stuff that used to crowd the sink.

If You Like The Country Style

You don't have to wait for your woodworking projects to look like antiques. With just a few hours work, you can add a hundred years to any piece.

By simply changing a few details, this same cabinet design becomes an instant country classic.

I chose poplar as the wood for the country cabinet since it's easy to work with and has tight grain that takes paint well. Frosted glass replaces the textured glass I used in the cherry version, and wood knobs and plain butt hinges complete the more modest appearance.

The paint job itself is two coats of milk paint over one coat of golden oak stain (Fig. A). (For information on the milk paint, see *Sources*

and *Resources* on page 80.)

Then the paint is sanded to give it a distressed look that would come from years of use and wear (Fig. B). Be careful as you sand — the idea is to just expose some of the stained wood underneath. If you sand through the stain, the wood will look new and ruin the rustic appearance.

Finally, add a coat of Danish Oil to deepen the color of the paint and give it a warm sheen (Fig. C).



MATERIALS LIST

A (2) Cabinet Top/ Bottom	$\frac{1}{2} \times 7 - 22$	M (8) Drawer Fronts/ Backs	$\frac{1}{2} \times 2\frac{7}{16} - 4 \frac{3}{8}$
B (2) Cabinet Sides	$\frac{1}{2} \times 7 - 23$	N (8) Drawer Sides	$\frac{1}{2} \times 2\frac{7}{16} - 6\frac{1}{4}$
C (1) Fixed Shelf	$\frac{1}{2} \times 6\frac{3}{4} - 22$	O (4) Plywood Bottoms	$\frac{1}{4} \times 3\frac{7}{8} - 6\frac{1}{4}$
D (1) Plywood Back	$\frac{1}{4} \times 22 - 22\frac{1}{2}$	P (1) Tissue Cover	$\frac{1}{2} \times 5\frac{3}{8} - 11\frac{3}{8}$
E (2) Vertical Part.	$\frac{1}{2} \times 6\frac{3}{4} - 6$	Q (2) Tissue Cover Stops	$\frac{1}{4} \times \frac{1}{4} - \frac{1}{2}$
F (2) Horizontal Part.	$\frac{1}{2} \times 5 - 6\frac{3}{4}$	R (4) Rails	$\frac{3}{4} \times 1\frac{3}{4} - 8\frac{1}{4}$
G (1) Top Cove Front	$\frac{1}{2} \times 2 - 23\frac{1}{2}$	S (4) Stiles	$\frac{3}{4} \times 1\frac{3}{4} - 16$
H (2) Top Cove Sides	$\frac{1}{2} \times 2 - 7\frac{1}{2}$	T (4) Filler Strips	$\frac{1}{4} \times \frac{1}{4} - 13$
I (1) Top Roundover Front	$\frac{1}{2} \times 2 - 24\frac{1}{4}$	U (4) Glass Stop	$\frac{1}{4} \times \frac{1}{4} - 64$
J (2) Top Roundover Sides	$\frac{1}{2} \times 2 - 7\frac{7}{8}$	V (2) Textured Glass Panels	$\frac{1}{8} \times 7\frac{5}{8} - 12\frac{7}{8}$
K (1) Bottom Roundover Front	$\frac{1}{2} \times 2 - 23\frac{1}{2}$	W (2) Adjustable Shelves	$\frac{1}{2} \times 5\frac{3}{4} - 21\frac{1}{4}$
L (2) Bottom Roundover Sides	$\frac{1}{2} \times 2 - 7\frac{1}{2}$	X (1) Cleat	$\frac{3}{4} \times 1\frac{1}{2} - 21\frac{1}{2}$

CUTTING DIAGRAM

$\frac{1}{2} \times 7\frac{1}{2} - 96"$



$\frac{1}{2} \times 7" - 96"$



$\frac{1}{2} \times 5\frac{1}{2} - 96"$

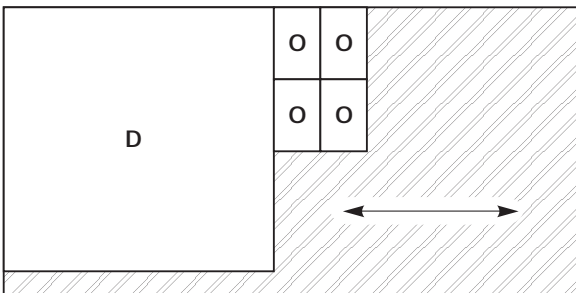


$\frac{3}{4} \times 5\frac{1}{2} - 96"$



Note: You will need about 120" of $\frac{1}{4} \times \frac{1}{4}$ " material for the Tissue Cover Stop Tabs (Q), Filler Strips (T), and Glass Stop (U)

$\frac{1}{4} \times 24" - 48"$ (PLYWOOD)



Dirt-Hungry Vacs

When it comes to shop vacuums, a big appetite is a must. But good manners are important, too. We tested four to see which offer the best combination of both.



There may not be any tool that gets more use and less respect than a shop vacuum. Few of us could get by without one, but we sure seem to complain a lot about the ones we own.

They're too noisy, they tip over, their hoses pop out, or they won't pick up what we're trying to clean up. Either we're a tough crowd to please, or the vacuums just aren't as good as they could be.

And I think the only tools available in more sizes are drill bits. Shop vacuums come in short and tall, fat and skinny, with everything from teeny-tiny fans to monster motors.

All in all, that spells confusion for anyone looking to buy a new vacuum. To help clarify the process, I rounded up a few shop vacuums to see how they perform.

I settled on 16-gallon models, one of the top-selling sizes. Then I

went to local stores to check the selection. I ended up with one vacuum each from Genie, Shop-Vac, Ridgid, and Craftsman.

By the way, it's worth noting that Ridgid and Craftsman vacuums are both made by Emerson Electric. So they're close cousins.

Okay, so how did these vacuums perform? I put all four through the same tests, detailed below, and came up with some recommendations.

SHOP VACUUM TESTING — AN OVERVIEW

Testing shop vacuums sounds easy. Just make a mess, then clean it up, right? Actually, that's not too far off, though I did get a bit more scientific.

Take a look at the photos at right to see a few of the tests I put these vacuums through. The chart below shows some of the test results.

Photo A: Sucking up a 5-gallon bucket of chips isn't a common shop chore, but it's a telling test. It shows whether a vacuum can keep up without clogging, and how quickly it may suck up that big pile of sawdust under the table saw.

I clocked this test three times with each vacuum, and took the average.

Photo B: Sometimes it's necessary to pick up heavy objects such as spilled fasteners. Sucking up several sizes of flat washers showed if the vacuums would pull them into the drum — or leave them in the hose when the vac got shut off.

Photo C: Even with a 16-gallon drum, a vac needs to be emptied fairly often. I wanted to know what it takes to dump solids and liquids from each vacuum.

Photo D: Shop vacuums are all loud, but some are noisier than others. Standing 5-ft. in front of the inlet with a decibel meter showed how loud each vacuum is from a typical operating position. With ratings between 80- and 90-decibels, these vacuums are noisier than most other machines in a shop.

Some of the other tests got interesting. Pulling each vacuum through an obstacle course of typical shop clutter showed if each one would track, stop, or fall over. All four vacuums did well. But the models with four swivel casters (Craftsman, Genie, Shop-Vac) moved through tight spaces more easily than the Ridgid which has two non-swiveling wheels.

Each vac was also rated for ease of assembly, changing filters, and more subjective measures such as quality and value.



TEST RESULTS AT A GLANCE

Vacuum:	Vacuumping 5-gal. wood chips:	Vacuumping 5-gal. water:	Sound level (decibels @ 5-ft.):
Craftsman	14.1 sec.	9.4 sec.	86 dB
Genie	12.2 sec.	7.3 sec.	90 dB
Ridgid	12.4 sec.	9.6 sec.	88 dB
Shop-Vac	11.4 sec.	9.6 sec.	81 dB



SHOP-VAC QSP PRO



The “QSP” in the Shop-Vac Pro’s name stands for “Quiet Super Power.” And compared to most shop vacuums, this one is quiet. At 81 decibels it still isn’t something you want to listen to all day. But it helps during big cleanup jobs or dust collection.

Virtues: Quiet; hose lock; rolls easily; storage caddy; swivel casters.

Vices: No blower port; Have to turn upside down to empty.

Verdict: Overall, a great vac. And the quiet operation makes up for its minor shortcomings.

What makes it quieter is the exhaust. Instead of a single outlet port, there are small openings around the motor. That breaks up the airflow, reducing the sound. The drawback is the vacuum won’t work as a blower.

Another drawback is that the sides of the drum wrap into the top. So the drum has to be turned completely upside down to be emptied.

On the plus side, the QSP Pro has a locking hose, an accessory caddy, and available fine dust bags. Combine those features with quiet operation, and this is my Editor’s Choice.

At a Glance:

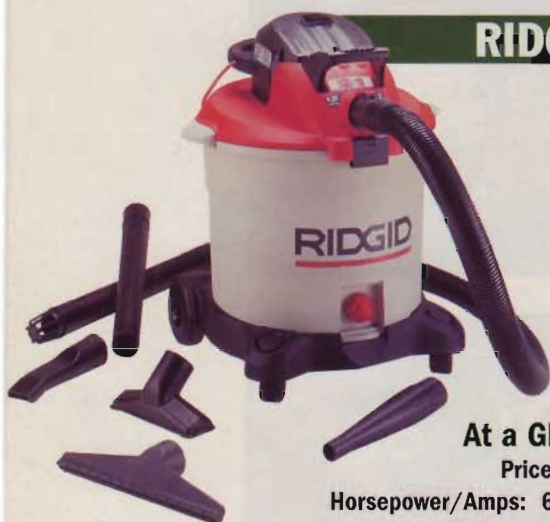
Price: \$95

Horsepower/Amps: 6.0/12

Contact: www.shop-vac.com

(570) 326-3557

RIDGID WD1660



The Ridgid WD1660 is a good shop vacuum with a split personality — it doubles as a blower.

As a vacuum, the Ridgid has plenty of power for pulling up a wet or dry mess. Pulling the vacuum is easy too, thanks to a locking hose

Virtues: Powerful; removable blower; locking hose; easy to empty.

Vices: Loud; poor switch location; no filter bag option.

Verdict: Well-built and powerful, plus it works well in both vacuum and blower modes.

that releases with a spring-loaded latch. Once full, this vacuum’s straight-sided drum empties easily.

To switch to blower mode, just push a release, and the motor pops off. The lid, filter, and drum stay behind, leaving a well balanced tool with a long (20-ft.) cord.

Downsides include noise (it’s second loudest at 88 decibels), and a switch positioned great for blower use, but hidden in vacuum mode.

If you need a good vacuum as well as a blower, then the Ridgid WD1660 is worth a look.

At a Glance:

Price: \$129

Horsepower/Amps: 6.25/12

Contact: www.ridgidwoodworking.com

or (800) 474-3443

CRAFTSMAN 113.177370



Craftsman shop vacuums have always been known for having strong suction. With this 5.5-hp model, the tradition continues. It has good power for wet or dry work.

The price for this power is noise. At 86 decibels, the Craftsman isn’t as

Virtues: Powerful; easy to empty; reasonably priced; locking hose.

Vices: Loud; friction-fit lid latches; no filter bag option.

Verdict: This one has all the basics covered — a no-frills design that gets the job done.

loud as some, but it’ll still send you reaching for ear plugs. The lid latches could also lock more positively.

On the plus side, the Craftsman has the same locking hose as the Ridgid — a nice feature.

Worth noting is that this model is normally sold with four swivel casters and a few accessories for around \$99. But watch for sales. I also picked up a “special” (it’s shown in photo) that included a caddy base, muffler, and extra accessories for only \$10 more.

Either way, the Craftsman is a good basic vacuum for the dollar.

At a Glance:

Price: \$99

Horsepower/Amps: 5.5/11.4

Contact: www.sears.com/craftsman

or (800) 377-7414



GENIE PRO 600Q

Genie calls this vacuum a "Pro" model. And compared to the company's smaller vacuums, this is a more substantial model, with plenty of suction power. Compared to the other vacuums tested, though, the Genie feels less heavily-built.

For example, the drum and hose are made of plastic that's thinner than the other vacuums. The tool caddy is flimsy too, and is held on with just one screw. These things make the Genie feel cheaper, yet it's priced about the same as the others tested. It's also loudest of the tested vacuums.

Another problem with this vacuum was a filter that fell off during use on several occasions. And the drum sides wrap far into the top, making the drum tough to empty.

So while this vacuum is capable, it's not on par with the others tested.

Virtues: Powerful; compact; rolls easily; drain accepts garden hose.

Vices: Loudest in test; flimsy tool caddy; poorly-fitting filter.

Verdict: The Genie does what it's asked to do, but it isn't as well built as similarly-priced vacuums.



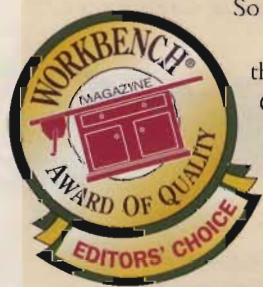
At a Glance:

Price: \$95

Horsepower/Amps: 6.0/12

Contact: www.geniecompany.com
or (800) 354-3643

FINAL RECOMMENDATIONS



So which of these four shop vacuums should you buy?

For general in-shop and around-the-house use, the Shop-Vac QSP Pro gets the *Workbench* Editor's Choice. This is mainly because of the quiet operation. But the Shop-Vac also offers plenty of power.

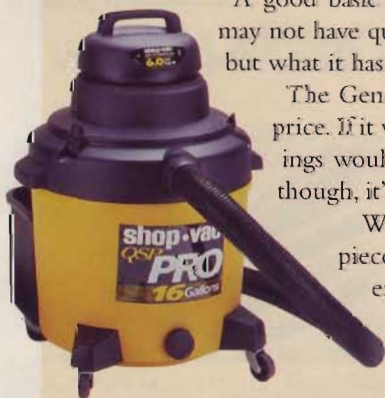
The company also makes a wide array of optional accessories, filters, and a couple fine-dust bags that make cleanup easier. (For more on this see *Filtration Options* on page 45.)

If a shop vacuum and a leaf blower are both on your wish list, buy the Ridgid WD1660. It's pricier than other standard vacuums, but still less expensive than buying a leaf blower and a vacuum separately. Plus, it's a well-built machine.

A good basic vacuum is the Craftsman. At 5.5-hp, it may not have quite the suction of higher-power models, but what it has is more than enough.

The Genie has some problems, and the biggest is price. If it were 20% lower, this vacuum's shortcomings would be more acceptable. At close to \$100, though, it's outclassed by the other three vacuums.

With those things said, I'll offer one more piece of advice. The real performance differences between the top three vacuums are slight. So you may want to scout for the best deal you can find and let price be the determining factor.



SOUND OFF ON-LINE

Now you know how we feel about these shop vacuums. Next, it's your turn. Do you agree with our conclusions, or has your experience been different? Letting us know is easy. Just go to the *Tool Reviews* page at

www.WorkbenchMagazine.com. We'll post your responses, and you can see how your feelings compare with ours, and with other *Workbench* readers.



POINTS-OF-VIEW

The best value to me is the Craftsman, given its combination of features and ease of use. I'd choose it first.

If I needed a blower and a vacuum, I wouldn't hesitate to buy the Ridgid. I like its features, and I couldn't buy both a blower and a vacuum for the price.

Bill Link
Workbench Assistant Editor

I would choose the Ridgid, since the blower would come in handy for jobs like cleaning the garage — just blast out the dirt rather than move everything to vacuum around it.

I also like the Shop-Vac since it's quiet, so that would be my next choice.

Kent Welsh
Workbench Project Coordinator

For me, choosing is a matter of weighing the pros and cons. After doing so, I'd go with the Shop-Vac. It's more compact than the others, and I like the quiet operation. I do wish the sides of the drum didn't wrap over the top.

If cost weren't a factor, I'd choose the Ridgid next.

Ken Munkel
Workbench Project Developer

10 Best Vac Accessories

Whether you run out and buy a new shop vacuum or keep the old one you own, here are some of the best accessories you can add to make clean-up a lot easier.

These attachments and accessories can tame an old, unruly vacuum, or make a new one better. And everything shown here fits almost any vacuum with a 2½"-dia. hose. To reach the manufacturers, see *Sources and Resources* on page 80.



Tug-Along Hose Kit

Duct tape is one way to hold a loose-fitting shop vacuum hose in place. Another is to pitch that old hose and replace it with a Tug-Along hose kit from Ridgid or Craftsman. It's the same setup used on each company's newer vacuums, but it fits most vacs with a 2½" hose. Attaching the coupling may take epoxy or a couple screws. For around \$20, it's a great way to prevent loose-hose hassles.

installs in the exhaust port, and cuts the sound by 5- to 7-decibels, which is enough to make a difference. The muffler is available from Ridgid or Craftsman for about \$10.



Hose Grip

This attachment slips between a shop vacuum hose and extension wand, providing a better place to grip the hose. Plus, it has a rotating collar that gives you some control over suction power. Also available from Ridgid or Craftsman, the grip costs around \$10.



Inflator Nozzle

The next time a wading pool or raft needs to be inflated, why not take advantage of the air flow from your shop vacuum's exhaust? The nozzle is \$6 from Ridgid or Craftsman.



Hose Reducer

This reducer from Shop-Vac makes it possible to use smaller-diameter attachments with a standard 2½" hose. Also, the smaller steps on the reducer fit the dust collection ports on many sanders and portable circular saws.



Exhaust Port Muffler

A whining shop vacuum motor is enough to drive anybody nuts. It's the combination of the shrill sound and the high volume. But when I attached this muffler to my vac I found the sound much more bearable. The muffler is just a simple baffle that breaks up the air flow. It



Gutter Nozzle

Cleaning rain gutters isn't anybody's favorite job, but I found this attachment makes it easier. The shape allows you to reach into gutters from below and vacuum or blow away accumulated debris. It's well worth the \$7, again from Ridgid or Craftsman.



Micro-Cleaning Kit

I recently had to clean the dust out of my computer keyboard and found the Micro-Cleaning Kit from Shop-Vac well worth the \$13 price. It fits on a 1¼"-dia. hose or on a reducer. The attachments are also great for getting into tight spots and crevices on woodworking projects.



Fine Dust Filter Bags

Jobs like sanding wood or drywall kick up fine dust that can pass through some vacuum filters. To keep the dust from getting back into the air, both Genie and Shop-Vac offer special insert bags (three for around \$5). They're similar to the bags used in household upright vacuums. The bags slip over the inlet port inside the

vacuum, and capture all the dust rather than just dumping it in the vacuum drum. When the bag is full, pull it out and throw it away, along with the dust contained inside.

Shop-Vac also offers a bag for drywall (two for around \$10) that stops even finer dust.

Ridgid and Craftsman don't offer filter bags, but both have liner bags that fit inside the vacuum drum.

Cartridge Filters

Most shop vacuum manufacturers make several types of filters for different cleanup needs. There's everything from foam sleeves with disposable paper covers to reusable "cartridge" filters. For more

information on what's available see *Filtration Options* below.

To stop fine dust from escaping, I use a cartridge filter. These are often made of pleated paper, and stop very small particles. Models referred to as "two-stage" work best. Most of the filters can be cleaned and reused.

Prices for these filters run from \$13 to \$25.

Another type of cartridge filter is available with a non-stick surface to resist clogging during use. Called Clean Stream, they're made by W.L. Gore Co. The filters are also washable for reuse. Models for most shop vacuums cost \$30 to \$35.



FILTRATION OPTIONS: WHAT EACH COMPANY OFFERS

All shop vacuums come with a filter suited for general use. But there are a variety of filters available to meet specific needs. Here's a run-down of the options.

Vacuum:	Dry Pickup Filter Bags			Dry Pickup Cartridges		Wet	Wet/Dry
	Drum Liners	Fine Dust Filter Bags	Drywall Filter Bags	1-Stage Pleated	2-Stage Pleated	Foam Filter	Filter plus Cover
Craftsman	✓			✓	✓		✓
Genie		✓		✓		✓	✓
Ridgid	✓			✓	✓		✓
Shop-Vac	✓	✓	✓	✓	✓	✓	✓

VACUUM-BASED DUST COLLECTION SYSTEM

Few things help keep a home shop cleaner than having a dust collection system. But the problem often comes down to price — dust collectors can get expensive.

But what if you could use your shop vacuum as a dust collector? That's the idea behind the Dust Collection Network from Ridgid or Craftsman. Just like big dust collection systems, this one has tubes and fittings that allow permanent installation on a wall. Blast gates for six machines and all the mounting hardware are included in the \$80 price. You supply the flexible hoses that run between the machines and system, and to the vacuum.



I found the system easy to set up, and I like the idea that if my shop needs grow, additional fittings and blast gates are available. The major downside is that a shop vacuum is usually noisier than a dust collector.



Gourmet Grilling



Center

Turn a simple kettle grill into an outdoor kitchen with this sturdy grilling center. A wide mahogany top holds all the barbecue fixin's while a cabinet keeps charcoal and supplies handy, yet hidden from view.

It's tough to beat the smokey flavor of a juicy burger that's been broiled over a glowing bed of red-hot coals. If only charcoal grills had some of the convenient features found on many of their fancier gas-fired counterparts.

Most charcoal grills are simple, metal kettles. You don't have anywhere to set a few condiments, much less a platter of burgers. The grills' tubular legs get wobbly over time, making them hard to wheel around. And where do you store the charcoal and lighter fluid? That's how this gourmet grilling center evolved.

By inseting the grill in a rolling cabinet, these problems were solved. An enclosed compartment under the work surface provides storage for charcoal, lighter fluid, and grilling accessories. And swapping a galvanized oil drain pan for the original, shallow ash catcher means you don't have to empty ashes as often.

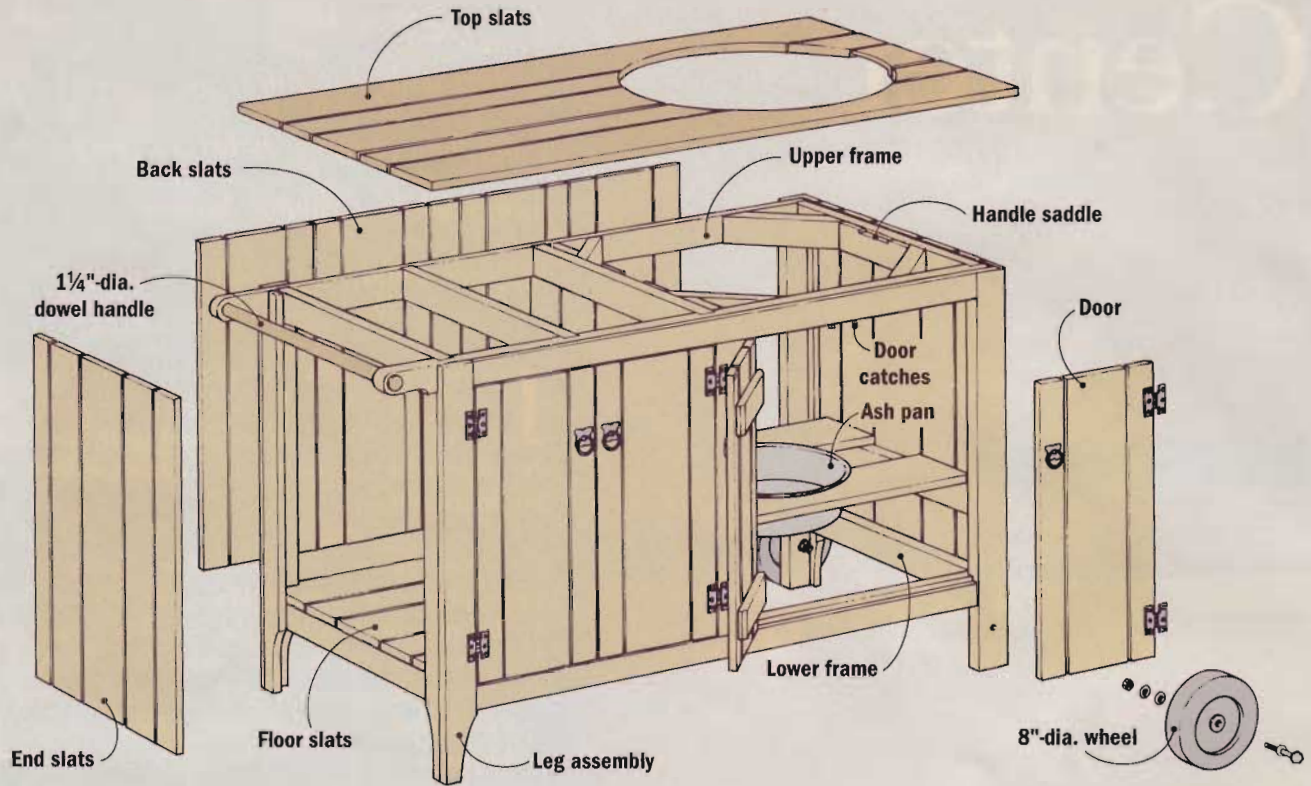
With its mahogany top and stained cedar cabinet, the grilling center makes an attractive addition to any deck or patio.



OVERALL EXPLODED VIEW

OVERALL SIZE: 31"D x 61½"L x 36"H

NOTE: For details on a Cutting Diagram and hardware, turn to **Sources and Resources** on page 80.



DESIGN CONSIDERATIONS

In designing the grilling center, several things had to be taken into consideration. First was the size of the grill itself. I designed this project around a 22½" Weber kettle grill that has two steel handles. Of course you don't want the kettle to touch the wooden cart so these two handles are used to support the grill.

The saddles that support the handles are positioned so the rim of the grill sticks up slightly above the top of the grilling center. This prevents items sitting on the work surface from accidentally rolling into the grill.

Another consideration was making sure the grill could draw enough air to operate properly. I

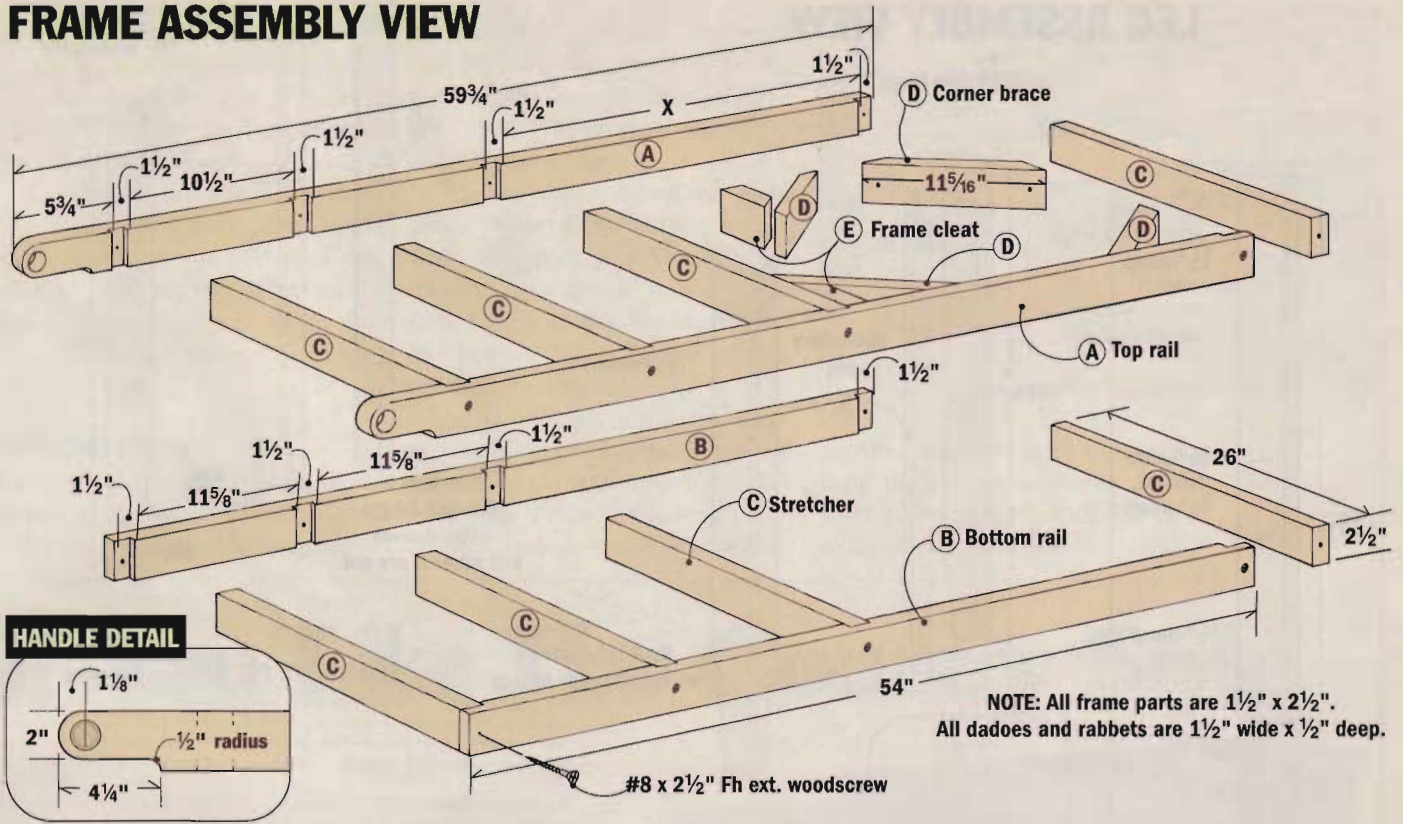
made sure this wasn't a problem by leaving the bottom of the grill compartment open and using slatted sides and doors. This makes construction simple and insures that the grill can "breathe." Since this is an outdoor project, the gaps also let moisture drain from the cabinet compartment and allow ventilation so it dries out quickly.

MATERIALS LIST

LUMBER:

A (2) Top Rails	1½" x 2½" x 59¾"	O (2) Divider Stiles	1½" x 1½" x 21½"	DD (3) Top Slats - Wide	¾" x 7" x 57½"
B (2) Bottom Rails	1½" x 2½" x 54"	P (1) Divider Slat - Wide	¾" x 7" x 23½"	EE (2) Top Slats - Narrow	¾" x 4¾" x 57½"
C (8) Stretchers	1½" x 2½" x 26"	Q (2) Divider Slats - Medium	¾" x 4¾" x 23½"	*Cut these parts to this size, then trim them to finished size.	
D (4) Corner Braces	1½" x 2½" x 11⅝"	R (2) Divider Slats - Outer	¾" x 5½" x 23½"	HARDWARE:	
E (2) Frame Cleats	1½" x 2½" x 5⅞"	S (2) Ash Pan Shelf Cleats	¾" x 2½" x 26½"	(24) #8 x 2½" Fh ext. woodscrews	
F (4) Primary Legs	1½" x 3" x 35¼"	T (2) Ash Pan Shelves	¾" x 7" x 27¾"	(218) #8 x 1¾" Fh silicon bronze woodscrews	
G (4) Secondary Legs	¾" x 2¼" x 35¼"	U (2) Face Frame Rails	¾" x 2" x 49½"	(48) #8 x 1¾" Fh silicon bronze woodscrews	
H (4) End Slats - Narrow	¾" x 3⅞" x 29¼"	V (1) Face Frame Stile	¾" x 3" x 25¼"	(8) Brass overlay hinges w/ screws	
I (4) End Slats - Medium	¾" x 4¾" x 29¼"	W (8) Back Slats - Narrow	¾" x 2½" x 29¼"	(4) Brass door pulls w/ face plates	
J (2) End Slats - Wide	¾" x 7" x 29¼"	X (4) Back Slats - Wide	¾" x 6⅜" x 29¼"	(4) Brass ball catches w/ screws	
K (1) Floor Slat - Wide	¾" x 7" x 27¼"	Y (1) Back Slat - Center	¾" x 3" x 29¼"	(2) 8" dia. offset hub lawnmower wheels	
L (2) Floor Slats - Medium	¾" x 4¾" x 27¼"	Z (8) Door Cleats	¾" x 2½" x 10½"	(2) ½" x 4" hexhead bolts	
M (2) Floor Slats - Outer	¾" x 5½" x 27¼"	AA (8) Door Slats - Narrow	¾" x 2½" x 25¼"	(6) ½" ID flat washers	
N (2) Divider Rails	1½" x 1½" x 28"	BB (4) Door Slats - Wide	¾" x 6⅜" x 25¼"	(2) ½" nylon sleeve locknuts	
		CC (2) Grill Handle Saddles	¾" x 2½" x 10½"	(1) 1⅞"-dia. mahogany dowel	

FRAME ASSEMBLY VIEW



CONSTRUCT THE FRAMES

The grilling center carcass consists of two ladder-type frames that are captured between four L-shaped legs (*Frame Assembly View*). To make the frames strong, the top rails (A) and bottom rails (B) have dadoes and rabbets to accept the stretchers (C).

Before laying out the locations of the dadoes in the top rail, remove the wooden handles from your grill and measure its outside width (the 'X' measurement in *Figure 1*).

You'll also notice in *Figure 1* that each pair of rails is cut from a

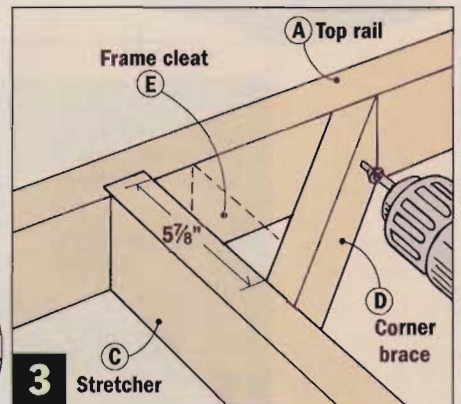
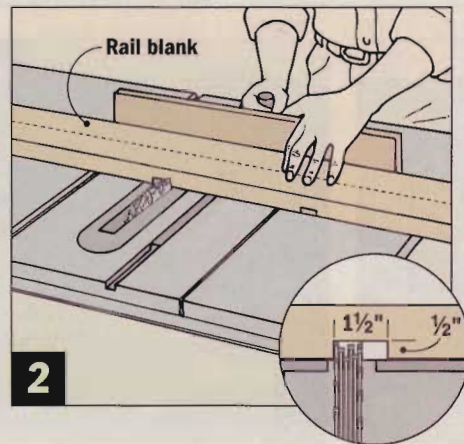
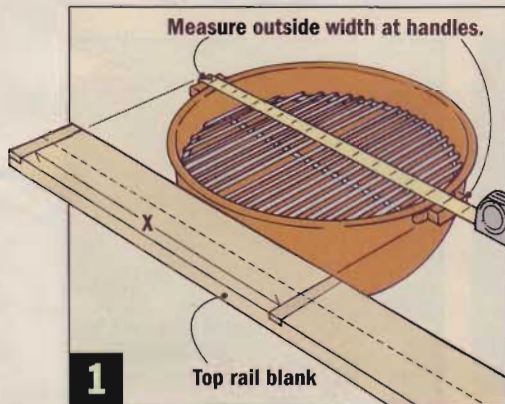
single 2x6 blank. By cutting the dadoes and rabbets in the blank first, then ripping the blank in half, your dadoes will align perfectly (*Fig. 2*). In most cases, it's also easier to find clear, straight stock by cutting it from dimensional lumber wider than a 2x4.

With the top and bottom rails cut to size, shape the handles on the top rails and drill the hole for the handle dowel (*Handle Detail*). Cut the stretchers (C) to length, then glue and clamp the frames together, checking them for square. Before

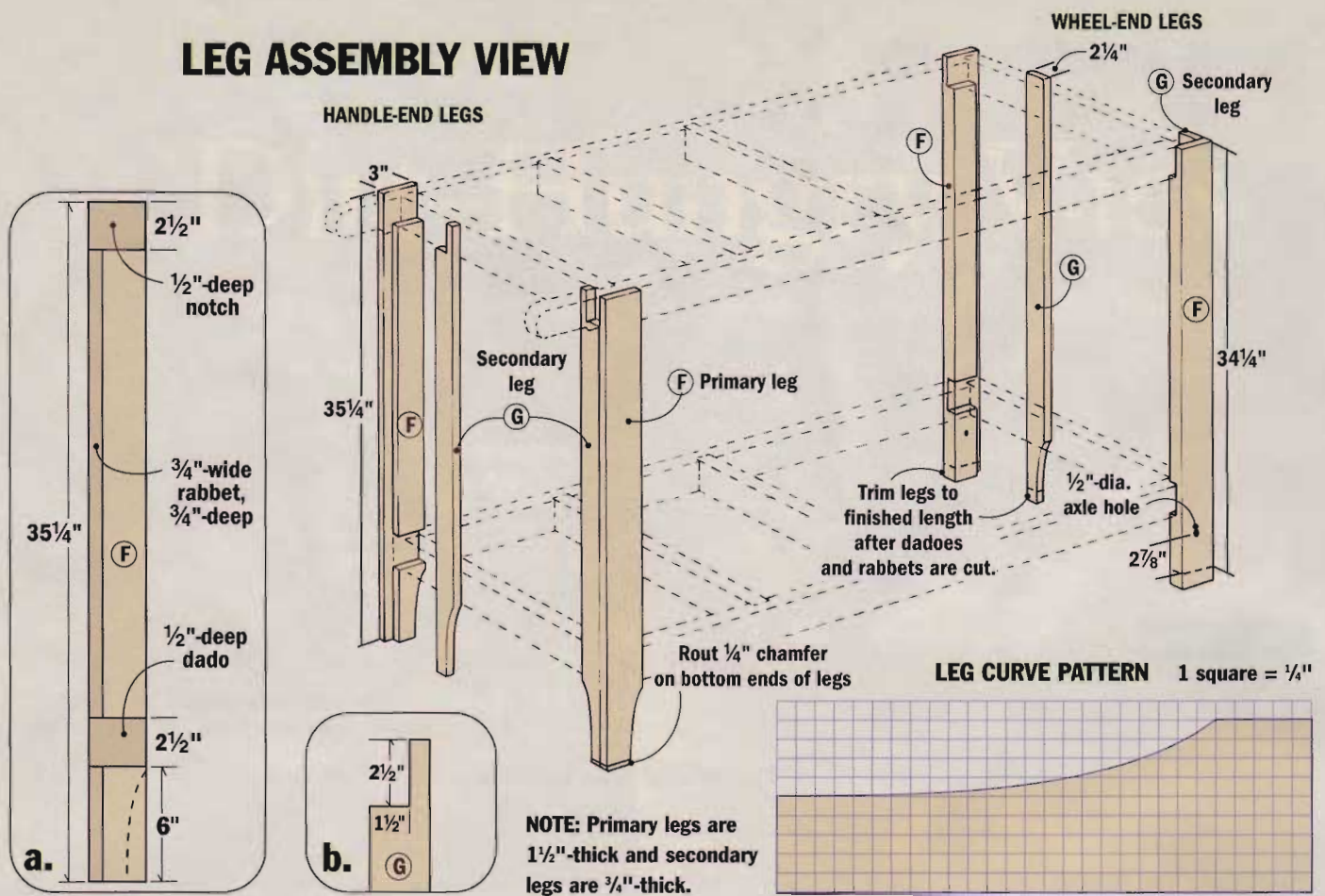
removing the clamps, drive one screw at each joint location.

The next step, shown in *Figure 3*, is to install the corner braces (D). These mitered pieces help add rigidity to the frame, but their primary purpose is to provide additional mounting points later for the mahogany top slats.

With the braces installed, glue and clamp frame cleats (E) between the stretcher and corner braces. You'll need these later when you install the divider frame of the storage compartment.



LEG ASSEMBLY VIEW



MACHINE THE LEGS

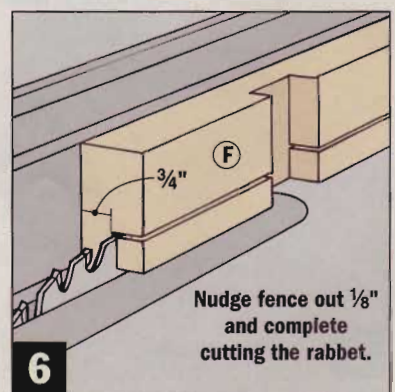
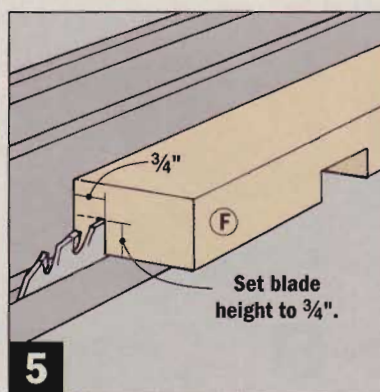
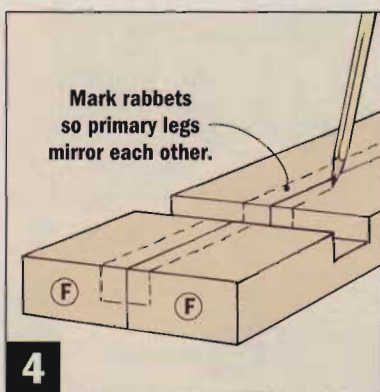
With the carcass frames assembled, it's time to construct the legs. If you look at the *Leg Assembly View* above, you'll see all four legs are constructed the same. They each consist of two pieces — a 1 1/2"-thick primary leg (F) and a 3/4"-thick secondary leg (G) — that are joined at right angles. The primary legs have a notch cut in the top end to accept the top frame and are dadoed for the lower frame (*Detail a*).

To make the primary legs (F), start with two extra-wide (6 1/4") blanks like you did with the rails. I used a 3/4"-wide dado blade in my table saw to make the notch and dado cuts in several passes. Then I switched back to my regular blade and ripped the blanks into four 3"-wide primary legs.

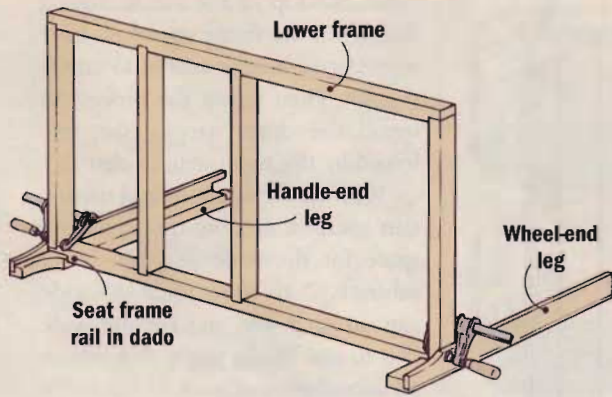
The secondary legs fit into a rabet cut along one edge of each primary leg. You need to cut the rabbets so the pairs of legs mirror each other.

To keep things properly oriented, I butted the two halves together and marked out the rabbets (*Fig. 4*). Then I made sure to cut the rabet in the edges as marked.

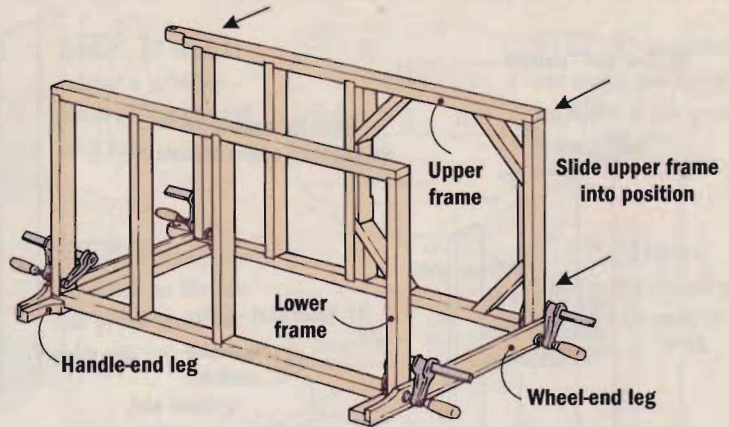
Rather than reinstall my dado blade at this point, I made the rabet cut in two passes with my regular blade. Here's how. Start by setting the fence 3/4" from the far edge of the blade and lower the blade to 3/4" high (*Fig. 5*). Make the first pass through the saw with the stock laid flat. Then



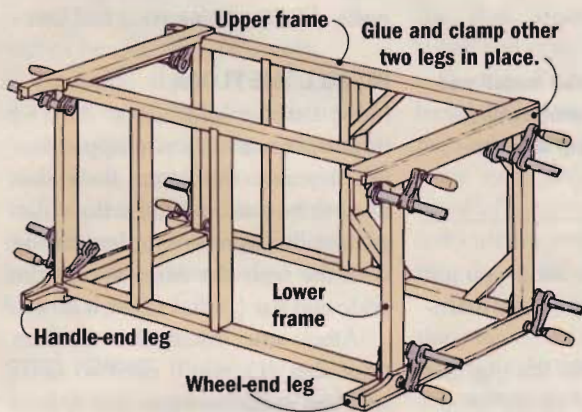
CARCASE ASSEMBLY SEQUENCE



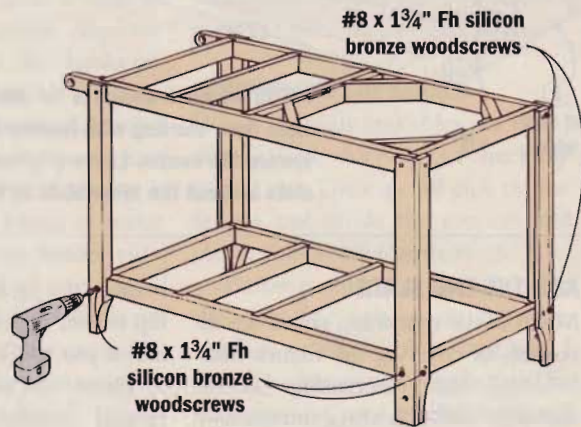
STEP 1: Glue and clamp the lower frame between one handle-end leg and one wheel-end leg.



STEP 2: Slide the upper frame into place and glue and clamp it to the legs.



STEP 3: Once the glue on the first two legs is dry, repeat Steps 1 and 2 to attach the other two legs.



STEP 4: Drill countersunk screw holes and drive screws at each leg-to-rail joint location.

nudge the fence away from the blade about $\frac{1}{8}$ " and hold the stock on edge for the second pass (Fig. 6).

After the primary legs are machined, rip the four secondary legs (G) to finished width from $\frac{3}{4}$ "-thick stock. Lay out the notch in the handle end legs to fit around the top rail and cut it with a jigsaw (Detail b on the previous page).

Next, enlarge the *Leg Curve Pattern* and transfer it to all four secondary legs and two of the primary legs. Note that the decorative curve goes opposite the notch on two of the secondary legs and opposite the rabbet on the two primary legs.

The next step is to trim the lower end of the wheel-end legs to provide ground clearance. Measuring from the top end, cut each handle-end leg

piece $3\frac{1}{4}$ " long. Then drill the holes for the wheel axle bolts in the primary legs.

Finally, assemble the legs by applying glue to both faces of the rabbet in the primary legs and clamping the secondary legs in place. Once the glue dries, rout a $\frac{1}{8}$ " roundover on all the exposed edges and a $\frac{1}{4}$ " chamfer on the bottom ends.

COMBINE THE LEGS AND FRAMES

At this point the grilling station begins to take shape. It may look unwieldy for one person to assemble, but if you take it in stages, as shown in the *Carcase Assembly Sequence* above, it's fairly easy to handle.

Start by laying one handle-end leg and the corresponding wheel-end leg on the floor so they rest on the pri-

mary leg portion of the assemblies (Step 1). Then add the lower frame. To make sure the rail is fully seated in the dadoes, place a block of scrap on the rail and give it a couple of firm blows with a hammer.

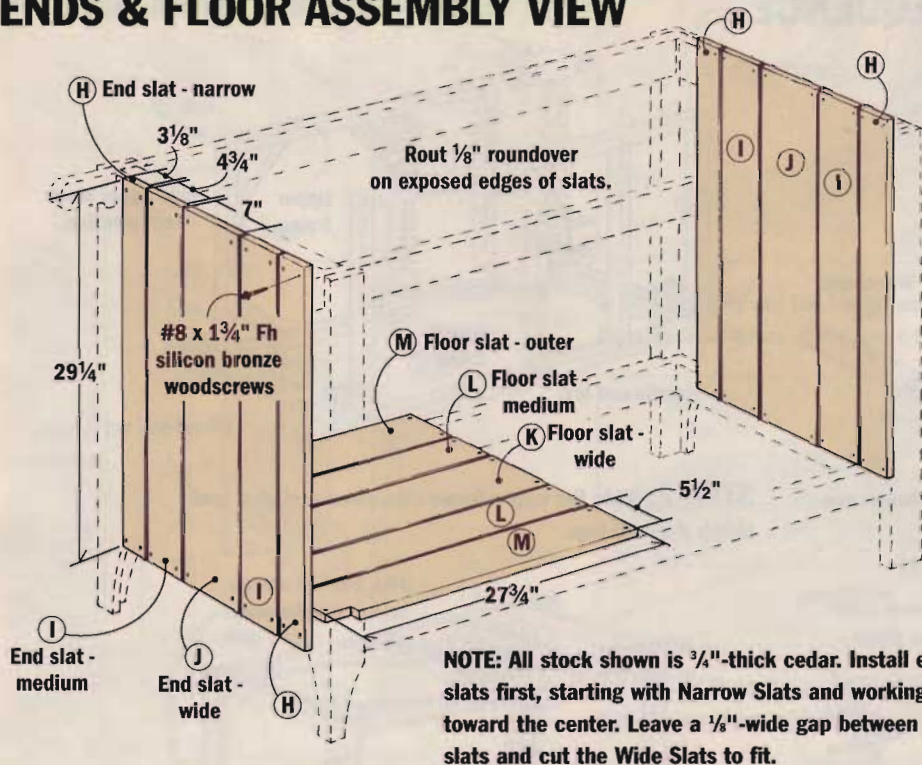
Next, add the upper frame (Step 2). If the notched secondary legs fit loosely, clamp them too (see the photo right).

Now, add the other two legs (Steps 3 and 4). Then sand the top surface of the carcass where the legs and upper frame pieces meet. This will allow the top slats to lay flat when they're installed later.



If the notch in the secondary leg fits loosely on the top rail, clamp the tab so it's firmly glued to the top rail.

ENDS & FLOOR ASSEMBLY VIEW



ADD THE END SLATS

Much of the remaining construction consists of covering the frames with 3/4"-thick slats. Alternating narrow and wide slats adds visual interest and this pattern is carried throughout the project. A 1/8"-wide gap between all the slats provides ventilation.

Since all the slats are screwed on, I decided it made sense to start by making some spacers and the drilling jig shown in the photo below. The jig makes it simple to position the screw holes a consistent 1" from the ends of the slats and 5/8" in from the edges, regardless of the slat's width. And

because the jig is two-sided, you just flip it over depending on the orientation you need.

Once you've built the jig and ripped several 1/8" x 3/4" x 3" spacer strips, rip four narrow (H) and four medium (I) end slats to width and cut them all to 29 1/4" long. After using the jig to drill the holes at both ends, rout a 1/8" roundover on the exposed edges. (This gives the slats a more finished look.)

Now take a look at *Figure 7* below to see how I installed the slats. First, I placed a spacer against one of the secondary legs and butted a nar-

row slat (H) against the spacer. Once the top of the slat is aligned flush with the frame stretcher, drive four silicon bronze screws to attach the slat. Then repeat the process to install the other narrow slat, followed by the two medium slats (I).

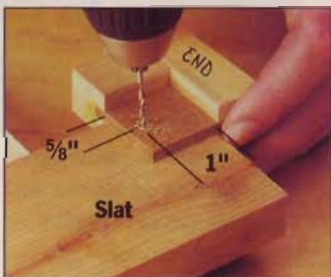
With all the medium and narrow slats installed, measure the remaining space for the wide slats (J). Now, subtract 1/4" to allow for a 1/8"-wide gap on each side, and cut the wide slats to size. While you're at it, rip an additional piece of stock to this width and about 60" long. You'll use this later to make the wide floor slat (K) and the wide divider slat (P). Then round over the edges, drill the screw holes and mount the wide end slats.

INSTALL THE FLOOR

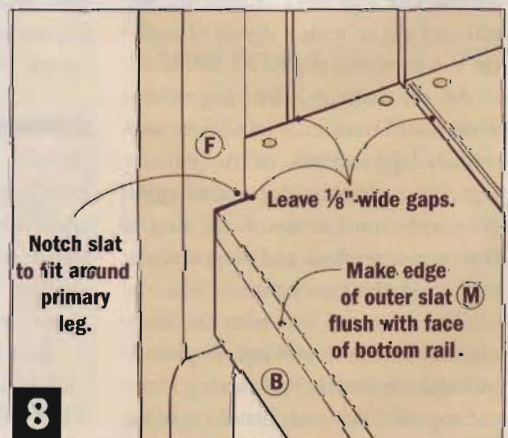
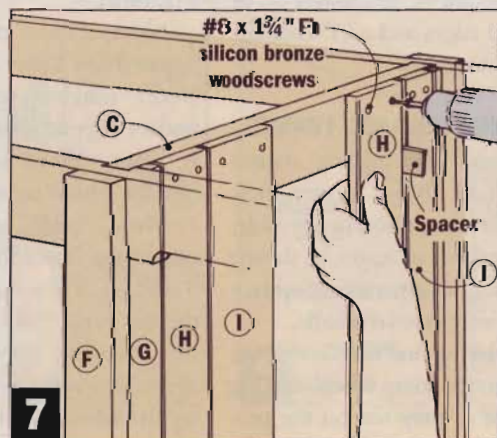
Now, cut the wide floor slat (K) from the extra stock you ripped earlier. Because the outer floor slats need to be custom fit, the floor slats are installed in reverse order, starting with the wide slat. Align it with the wide end slat (J) and screw it down.

After you install the medium floor slats (L), you'll need to measure and trim the outer slats (M) to width (remember to allow for a 1/8" gap between the medium slats and the outer slats).

The outer slat at the front of the cabinet compartment should be flush with the bottom rail (*Fig. 8*). The outer slat at the back of the cabinet compartment gets trimmed so it's inset 1/8" from the outside face of the bottom rail (and the back slats once they're installed).



A simple pine and hardboard jig accurately positions screw holes in the slats. To drill the second hole, flip the jig over.



The final step is to notch the outer slats to fit around the primary legs (see Fig. 8 again). I used a jigsaw to cut the notches and trimmed them to leave a $\frac{1}{8}$ " gap between the slat and the leg.

FRAME THE DIVIDER

A simple divider separates the storage compartment from the grill compartment (*Assembly View* at right). Start by cutting the divider rails (O) and stiles (N) to length from 2x2 stock. Next, rabbet both ends of each rail. This helps keep the divider from racking when it's glued and screwed together.

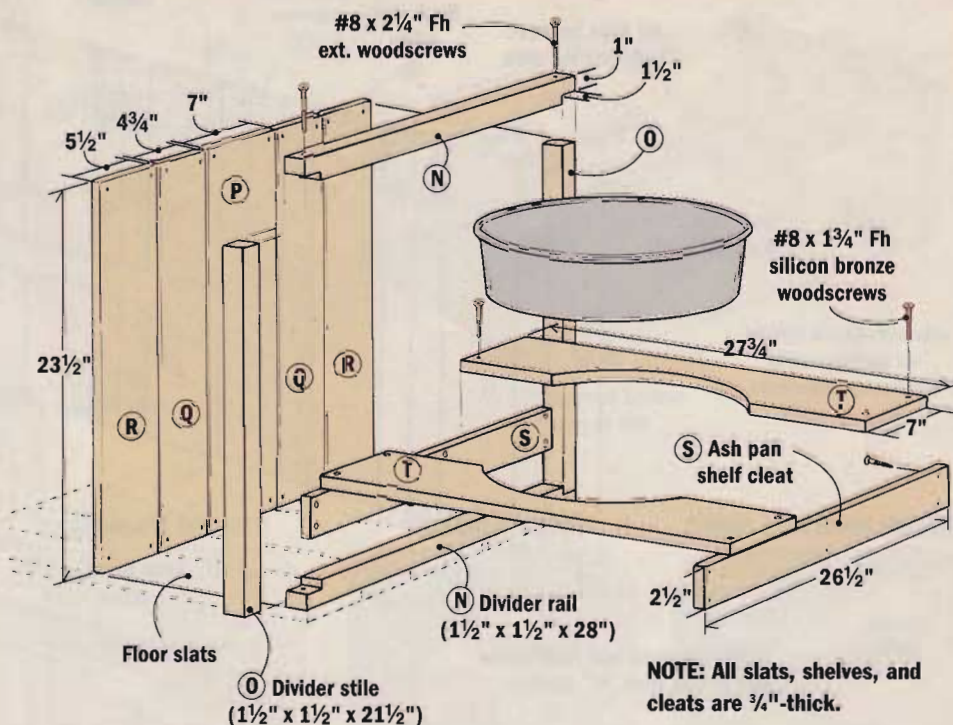
Once the divider frame is assembled, mount it on top of the floor slats, flush with the ends of the slats (Fig. 9). Here's where the frame cleats (E) that were installed earlier on come into play. Use a framing square to position the divider vertically, then drive screws to attach it to the frame cleats.

Next, cut the divider slats (P, Q, and R) to size as shown in the *Assembly View* at right. (They should match the width of the corresponding floor slats.) Then attach them to the frame, starting with the wide slat (P) and working your way out.

BUILD THE ASH PAN SHELF

One of the features I really like about this project is the ash pan. It's really just a galvanized steel pan commonly used for oil changes and available at automotive parts stores. But it holds a lot so it doesn't have to be emptied very often.

DIVIDER & ASH PAN ASSEMBLY VIEW



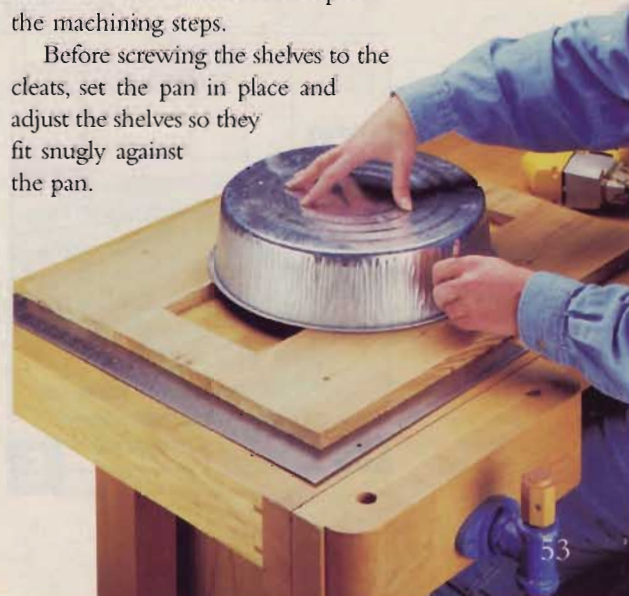
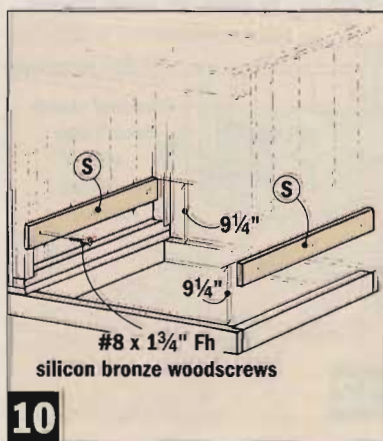
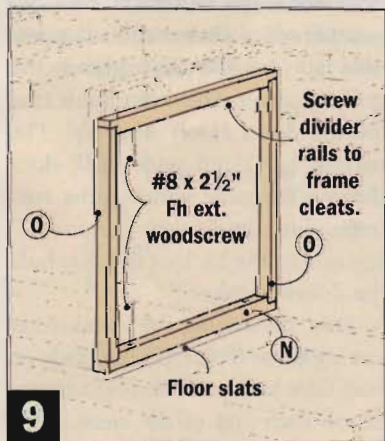
The pan is centered under the grilling compartment and held in place by two shelves. Actually, the pan hangs between the shelves, resting on its rim. The shelves (T) are screwed down to cleats (S) that are mounted to the divider slats and end slats inside the compartment.

Start by cutting the cleats from 1x stock and screwing them to the divider and end slats (Fig. 10). Be sure to measure from the bottom rails — not from the divider frame or the floor slats — for each cleat so the shelves wind up level across their length and with each other.

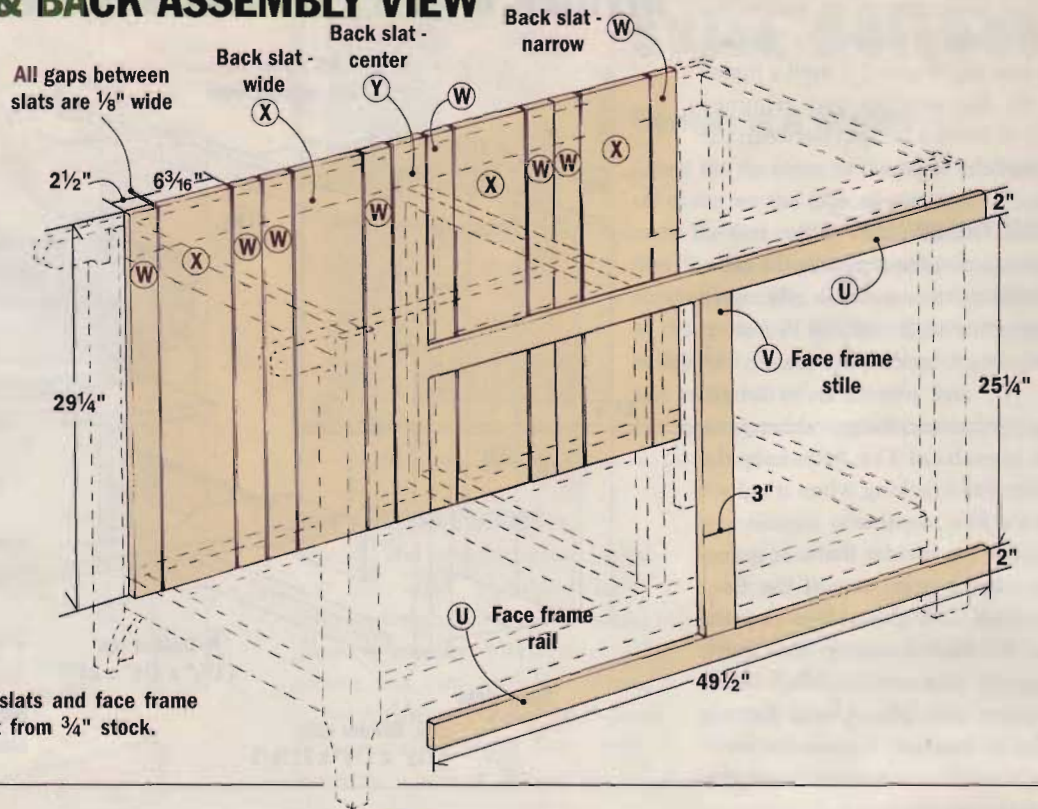
After cutting the shelves to length, lay out the arcs for the ash pan. As you can see in the photo below, I did this by placing the shelves flat on my bench with a couple pieces of 7"-wide scrap between them. You'll also notice the pan is upside down. Since the bottom of the pan curves under, it was easier to use the rim to mark out the arcs.

With the pan centered on top of the shelves, I traced the outline of the pan. Then I cut the arcs to shape using a jigsaw and sanded the edges smooth. A $\frac{1}{8}$ " roundover completed the machining steps.

Before screwing the shelves to the cleats, set the pan in place and adjust the shelves so they fit snugly against the pan.



FACE & BACK ASSEMBLY VIEW



NOTE: All slats and face frame pieces cut from 3/4" stock.

ENCLOSE THE BACK

With the inside portion of the grilling center completed, turn your attention to enclosing the carcass frame. Like the ends, slats cover the back (*Assembly View* above).

When you screw on the back slats, use spacers like you used earlier when you installed the end slats. Before you start, however, turn the carcass on its face and let gravity hold the slats in position. Work your way in from each end, screwing down the narrow (W) and wide (X) slats as you go. Then measure and trim the center slat (Y) to fit and screw it down.

FILL IN THE FACE FRAME

Adding a 3/4"-thick face frame to the front of the grilling center gives it a finished look by covering up the carcass rails and the divider. It also provides a surface to mount the hinges for the two center doors.

If you look at the face frame in the *Assembly View* above, you'll see it looks like an "H" laid on its side. Since the primary legs form the outer stiles, you only need two face frame rails (U) and a center stile (V).

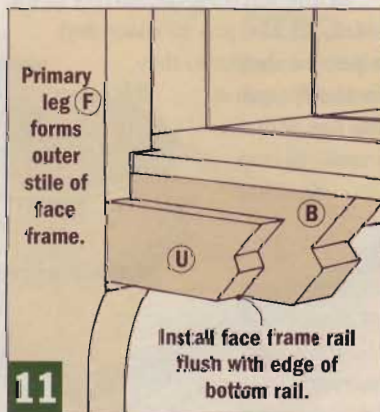
The easiest way to work on the face frame is to find a helper and turn the carcass on its back. (The

added weight of the back slats makes this a two-person job.)

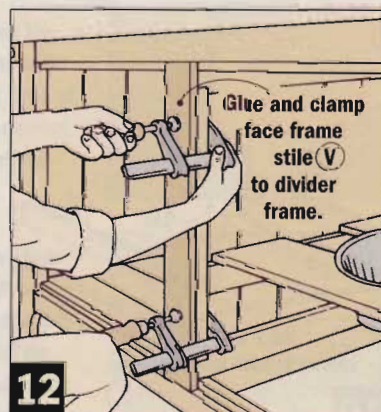
Start by ripping the face frame rails to width. Then measure the distance between the legs at both rail locations, and trim each face frame rail to fit.

Now, apply glue to the back and ends of the face frame rails and clamp them to the carcass rails. Be sure they're aligned with the rails at the top and bottom (*Fig. 11*).

With the face frame rails installed, measure and cut the stile (V) to fit between the rails. It also gets glued and clamped in place (*Fig. 12*).



11



12

ASSEMBLE THE DOORS

I mentioned earlier that the slat pattern is repeated throughout the grilling center. This even holds true for the doors (*Door Assembly*). The narrow (AA) and wide (BB) door slats are the same width as the corresponding back slats. Cleats (Z) screwed to the back of the slats hold the doors together.

Start by making the cleats. After cutting them to size, tilt the blade on your table saw to 45° and cut a chamfer on each end of the cleats (*Cleat*

Detail). Knocking the sharp corners off makes reaching into the cabinet a little easier on the hands by reducing the chances for splinters.

Next, drill the mounting screw holes and cut the door slats to length to fit the door opening.

Here's a tip for assembling the doors square and flat. Lay the slats face down on your table saw table and butt the ends against the rip fence (*Fig. 13*). Then insert $\frac{1}{8}$ "-thick spacers between the slats, clamp them together, and screw the cleats down.

FITTING THE DOORS

The doors are inset so they're flush with the face frame. If you haven't installed inset doors before, you may want to turn to *In the Shop* on page 70 for some additional pointers on how to fit them.

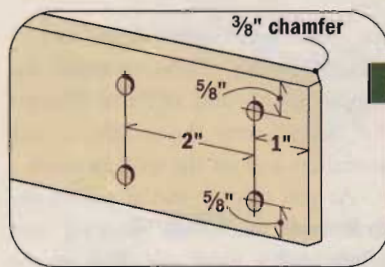
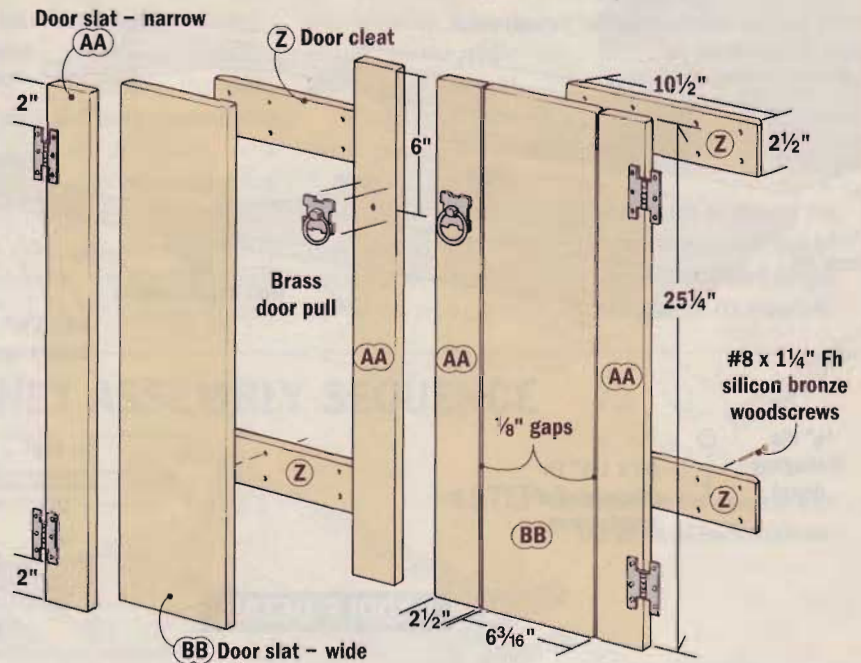
Since this is an outdoor project, the gap around and between the doors is $\frac{1}{8}$ ". This gives them plenty of room to swell without sticking and also matches the gap between the slats.

With the doors assembled, fitting them takes a few simple steps. Begin by measuring and marking the centerline of each opening on both face frame rails.

Now, set one door in place, and check the fit along the hinge edge. If the door and opening line up squarely, proceed to the next step. If it fits at one end and has a gap at the other end, lay your square along the hinge edge and mark the door parallel to the edge of the opening (*Fig. 14*). Then trim the door as marked.

DOOR ASSEMBLY VIEW

NOTE: All door parts are $\frac{3}{4}$ " thick.



CLEAT DETAIL

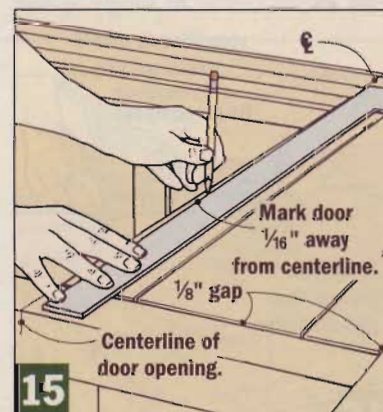
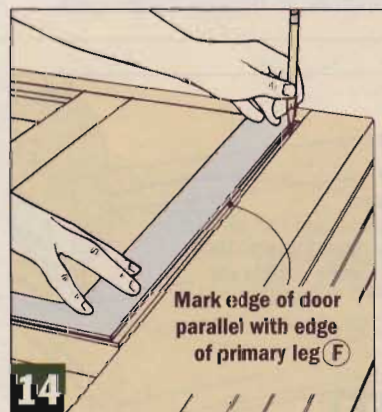
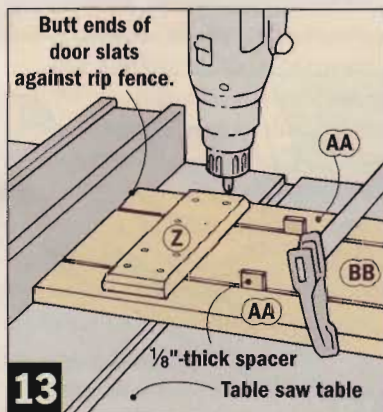
NOTE: For information on the hinges and door pulls, turn to *Sources and Resources* on page 80.

When the hinge edge fits, place a $\frac{1}{8}$ "-thick spacer between the leg and the door. Set your square $\frac{1}{16}$ " from the centerline marks and mark the other edge of the door (*Fig. 15*).

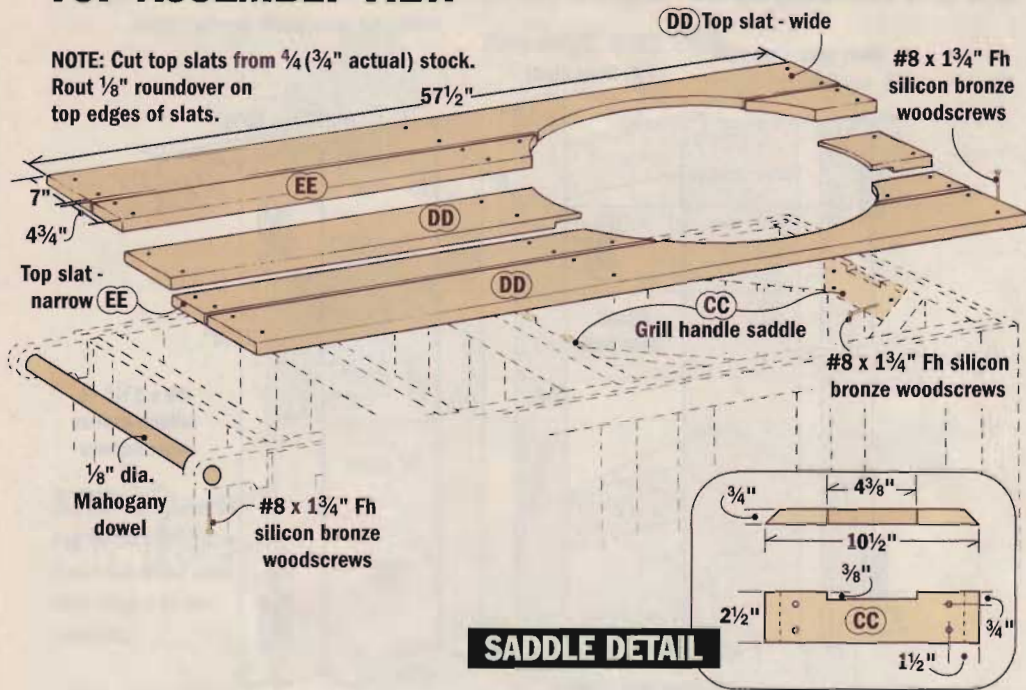
Finally, mark the door to leave a $\frac{1}{8}$ "-wide gap at the top and bottom. After trimming the door, mark

it as "1." Then repeat this fitting process for doors "2," "3," and "4" in their respective positions.

Since you don't mount the hinges until after you've applied finish to the grilling center, the numbers help keep the doors properly oriented for installation.



TOP ASSEMBLY VIEW



NOTE: Cut top slats from $\frac{1}{4}$ ($\frac{3}{4}$ " actual) stock. Rout $\frac{1}{8}$ " roundover on top edges of slats.

Unlike the end and back slats, the $\frac{1}{4}$ mahogany top slats are installed an inch or two extra-long, then trimmed to length. Start by clamping down a wide top slat (DD) in the center. Then drill mounting screw holes at the stretcher locations and screw the slat in place.

Next, use $\frac{1}{8}$ "-thick spacers to install the narrow slats (EE) and remaining wide slats. Measure and mark all of the screw hole locations to keep them lined up.

Using the reference marks you made earlier, locate the centerpoint of the grill on the top (Fig. 16). With this point located, use a beam compass to lay out a circle that's 1" larger ($23\frac{1}{2}$ " in my case) than the diameter of the grill. This keeps the top slats $\frac{1}{2}$ " away from the grill.

To cut out the circle, drill an entry hole inside your mark, then use a jigsaw to cut the grill hole (Fig. 17). You may want a helper to support the waste pieces from underneath to prevent them from snapping off near the end of the cut.

While the top slats are still mounted, use a framing square to mark them to length ($57\frac{1}{2}$ "). I numbered each top piece so I could easily reinstall each one later, then carefully backed out the screws and removed the top slats.

Because the grill handles stick up above the saddles, you need to rabbet the underside of the center slat to accommodate this (Fig. 18). I cut the rabbet using a dado blade in my table saw. With the grill in the saddles, I test fit the pieces and snuck up on the proper rabbet depth.

Once the rabbets fit, sand the top

INSTALL THE HANDLE SADDLES

At this point, you're in the final phase of construction, but don't break out the burgers quite yet. The remaining steps aren't difficult, they just require some fitting.

If you look at the photo at left, you can see how the the kettle grill is supported by two saddles (CC).

Notches cut in the saddles keep the handles from moving side-to-side. The shallow depth of the notches places the rim of the grill slightly above the surface of the top.

To make the saddles, miter the ends so the saddles fit snugly against

the stretchers and corner braces (Saddle Detail). Then measure the handle width and cut the notches $\frac{1}{8}$ " deep. Screw the saddles to the stretchers and set the grill in place.

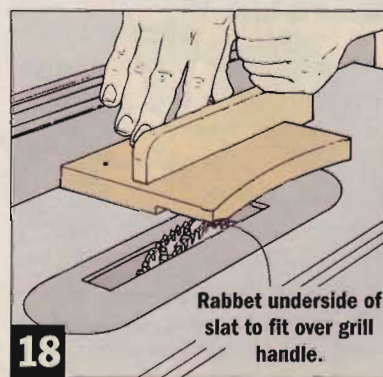
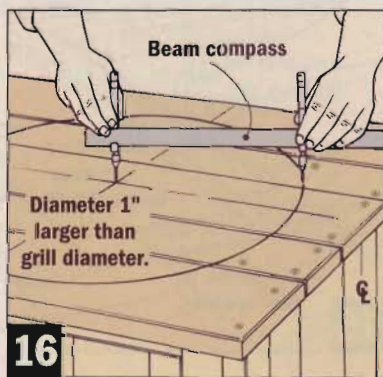
As you can see in the photo, my grill had small tabs sticking out where holes were punched in the handle, so I tapped the handles with a hammer to seat these tabs.

PUT ON THE TOP

Set the grill aside for now while you work on the top. But first, measure and mark the centerline of the grill compartment on the outer faces of the face frame rail, the wide end slat, and on the back. These give you reference points later when you cut the opening in the top for the grill.



The notched handle saddles support the grill and prevent it from moving side-to-side.



slats smooth, then rout a $\frac{1}{8}$ " roundover on all the edges, including the perimeter of the grill hole.

Finally, cut a mahogany handle dowel to length so it sticks out $\frac{1}{8}$ " beyond the top rails, then sand a slight chamfer on each end. But hold off installing it until after you've applied finish to the project.

WRAPPING THINGS UP

While you have the top slats off is a great time to apply finish to the top slats and stain to the carcass. Since this is an outdoor project, I applied four coats of spar varnish to the mahogany top and handle dowel. To make it easier to lay down a uniform first coat, I thinned the varnish with mineral spirits. After that, I used the varnish full-strength, sanding lightly between coats.

The cedar carcass and doors also need protection from the elements. For them, I used a semi-transparent acrylic/oil stain (Valspar's Severe Weather "Stonehedge").

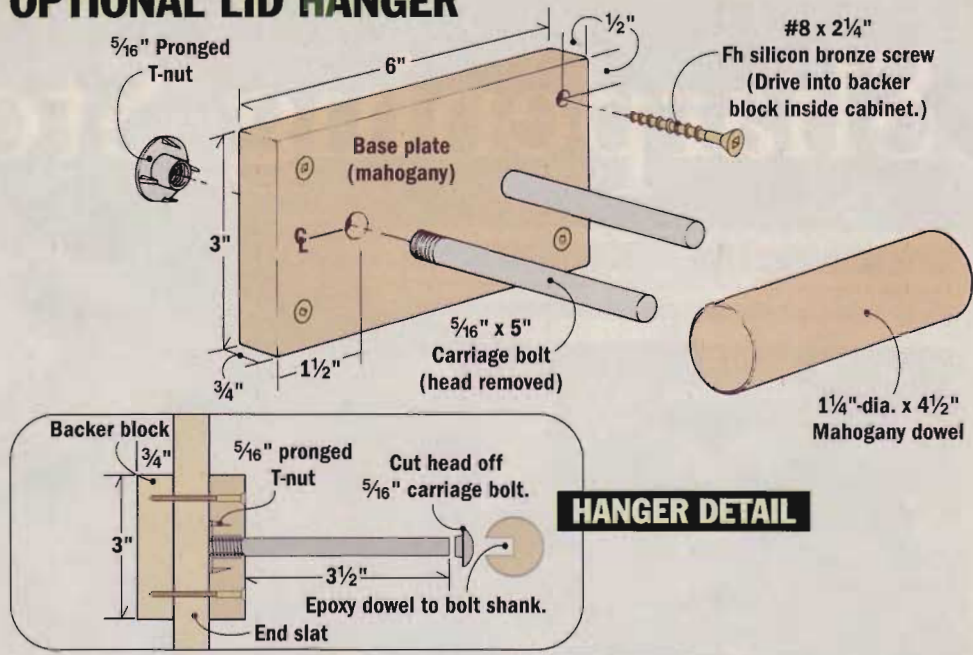
FINAL ASSEMBLY

Once the finish dries, it's time to assemble the grilling center. I started by mounting the door hinges. Carefully lay the center on its back, then check the door "numbers" so you mount them in the right order.

If you use $\frac{1}{8}$ "-thick spacers to position the doors, you can center the hinges over the gap and screw them down (Fig. 19). Then install the door pulls and door catches.

To install the wheels, turn the center upright and raise the wheel end up on blocks (Fig. 20). Then set the kettle grill into the saddles and

OPTIONAL LID HANGER



install the top slats, checking them for the proper orientation.

Finally, slide the handle dowel into position — you may need to sand the holes slightly. With the handle in place, drill screw holes in the underside of the rails and through the handle, finally drive screws to attach the handle firmly.

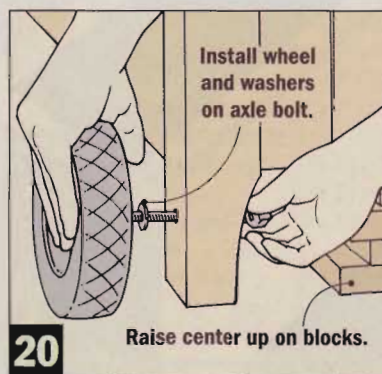
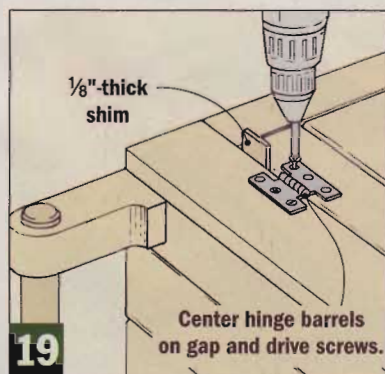
CONSIDER A LID HANGER

The first time I used the grilling center, I realized it needed a place to hang the grill's lid. Using a mahogany block and a leftover piece of handle dowel, I fashioned the lid holder shown in the drawing above.

To make the hanger, I drilled holes and installed the T-nuts in the base plate. Next, I cut the heads off two 5" long carriage bolts. I drilled two holes in the dowel and epoxied

it onto the bolts. You'll want to back up the cedar end slats with a hardwood backer block to give the mounting screws something substantial to bite into (*Hanger Detail*).

Even if you don't add the lid hanger, the grilling center is still a real pleasure to use. And with its great looks and handy work space, it may even help make you a better backyard chef.



MATERIALS LIST

Lumber:

A	(2)	Top Rails	1½" x 2½" x 59¾"
B	(2)	Bottom Rails	1½" x 2½" x 54"
C	(8)	Stretchers	1½" x 2½" x 26"
D	(4)	Corner Braces	1½" x 2½" x 11½ ¹⁶ "
E	(2)	Frame Cleats	1½" x 2½" x 5 ⁷ / ₈ "
F	(4)	Primary Legs	1½" x 3" x 35¼" *
G	(4)	Secondary Legs	¾" x 2¼" x 35¼" *
H	(4)	End Slats - Narrow	¾" x 3 ¹ / ₈ " x 29¼"
I	(4)	End Slats - Medium	¾" x 4 ³ / ₄ " x 29¼"
J	(2)	End Slats - Wide	¾" x 7" x 29¼"
K	(1)	Floor Slat - Wide	¾" x 7" x 27¾"
L	(2)	Floor Slats - Medium	¾" x 4 ³ / ₄ " x 27¾"
M	(2)	Floor Slats - Outer	¾" x 5½" x 27¾" *
N	(2)	Divider Rails	1½" x 1½" x 28"
O	(2)	Divider Stiles	1½" x 1½" x 21½"
P	(1)	Divider Slat - Wide	¾" x 7" x 23½"
Q	(2)	Divider Slats - Medium	¾" x 4 ³ / ₄ " x 23½"
R	(2)	Divider Slats - Outer	¾" x 5½" x 23½" *
S	(2)	Ash Pan Shelf Cleats	¾" x 2½" x 26½" *
T	(2)	Ash Pan Shelves	¾" x 7" x 27¾"
U	(2)	Face Frame Rails	¾" x 2" x 49½"
V	(1)	Face Frame Stile	¾" x 3" x 25¼"
W	(8)	Back Slats - Narrow	¾" x 2½" x 29¼"
X	(4)	Back Slats - Wide	¾" x 6 ³ / ₁₆ " x 29¼"

Y	(1)	Back Slat - Center	¾" x 3" x 29¼"
Z	(8)	Door Cleats	¾" x 2½" x 10½"
AA	(8)	Door Slats - Narrow	¾" x 2½" x 25¼"
BB	(4)	Door Slats - Wide	¾" x 6 ³ / ₁₆ " x 25¼"
CC	(2)	Grill Handle Saddles	¾" x 2½" x 10½"
DD	(3)	Top Slats - Wide	4/4" x 7" x 57½"
EE	(2)	Top Slats - Narrow	4/4" x 4 ³ / ₄ " x 57½"

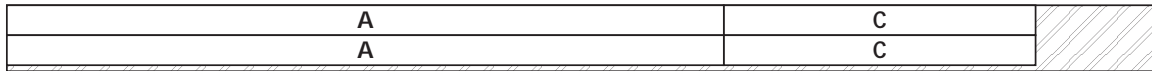
*Cut these parts to this size, then trim them to finished size.

Hardware:

(24)	#8 x 2½" Fh ext. woodscrews
(218)	#8 x 1¾" Fh silicon bronze woodscrews
(48)	#8 x 1¼" Fh silicon bronze woodscrews
(8)	Brass overlay hinges w/ screws
(4)	Brass door pulls w/ face plates
(4)	Brass ball catches w/ screws
(2)	8"-dia. offset hub lawnmower wheels
(2)	½" x 4" hexhead bolts
(6)	½" ID flat washers

CUTTING DIAGRAM

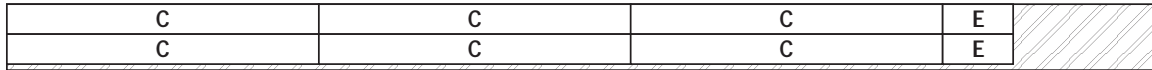
2 x 6 - 96"



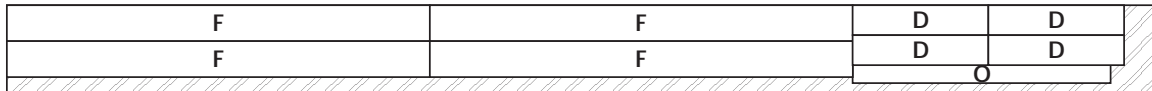
2 x 6 - 96"



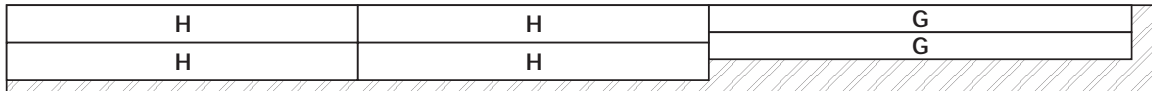
2 x 6 - 96"



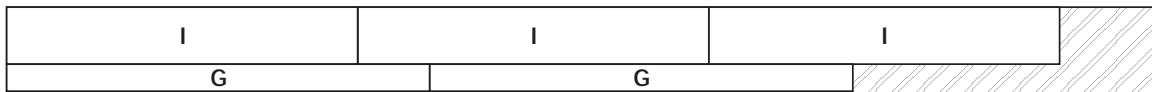
2 x 8 - 96"



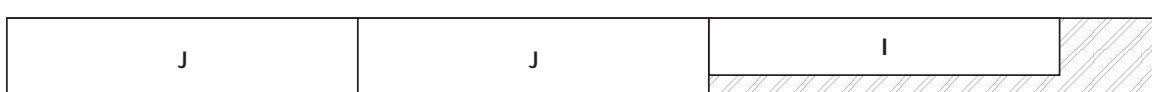
1 x 8 - 96"



1 x 8 - 96"



1 x 8 - 96"



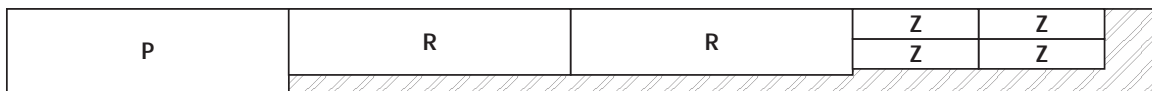
1 x 6 - 96"



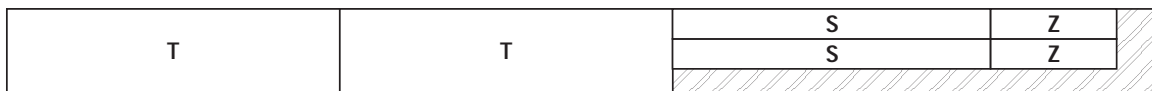
1 x 8 - 96"



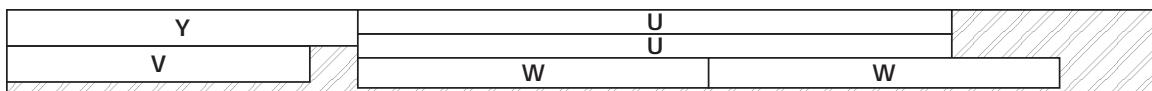
1 x 8 - 96"



1 x 8 - 96"



1 x 8 - 96"



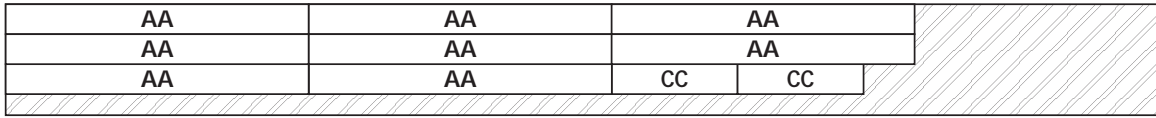
1 x 8 - 96"



1 x 6 - 96"



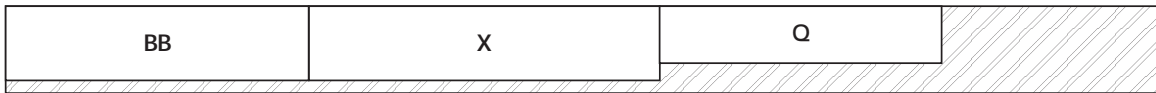
1 x 10 - 96"



1 x 8 - 96"



1 x 8 - 96"



4/4 x 7½ - 60" THREE BOARDS (MAHOGANY)



4/4 x 5 - 60" TWO BOARDS (MAHOGANY)

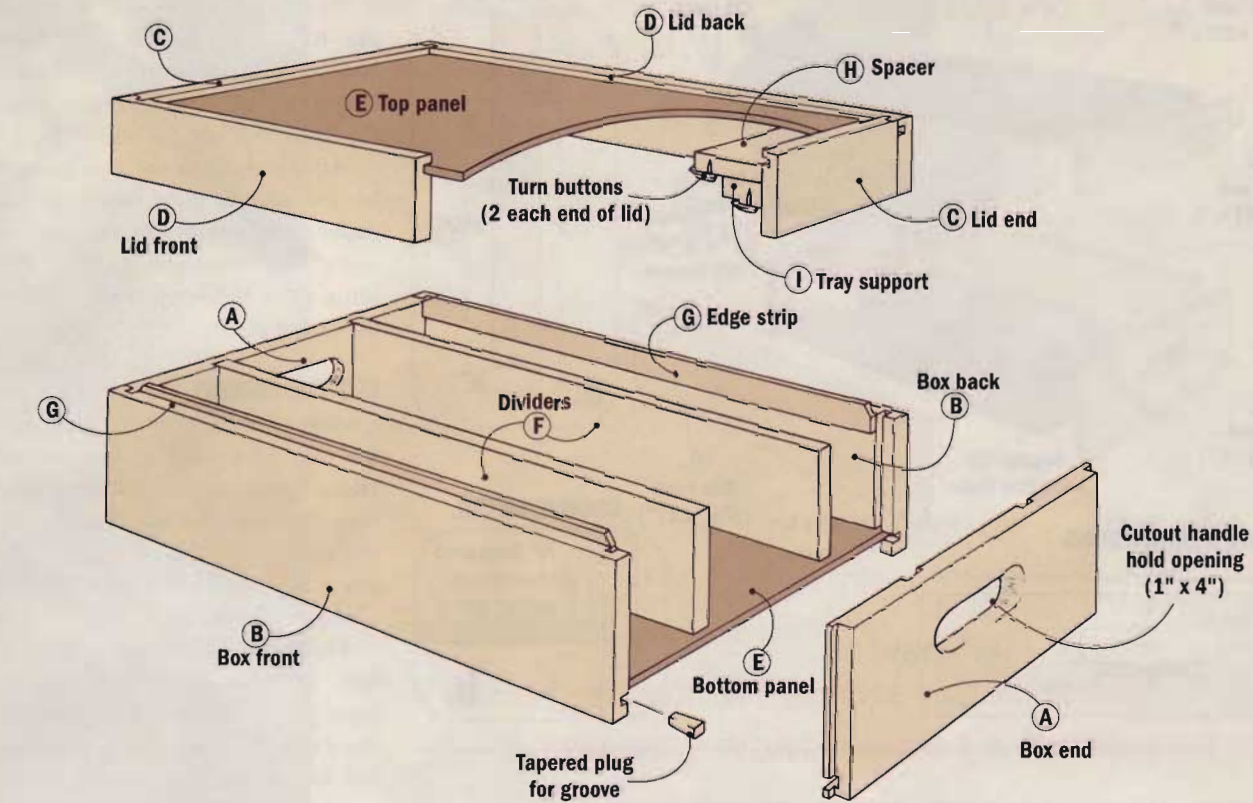


Sharpening Store-All

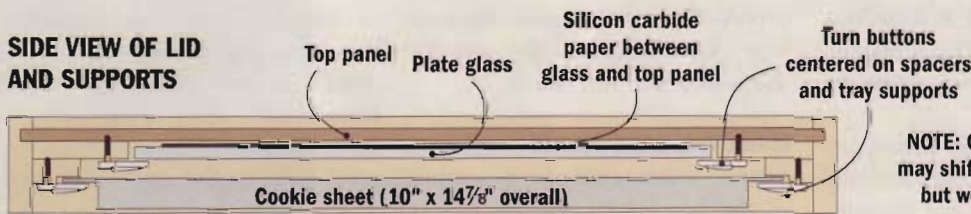


STORAGE CASE ASSEMBLY VIEW

OVERALL SIZE: 12"W x 17"L x 5¹/₂"H



SIDE VIEW OF LID AND SUPPORTS



NOTE: Glass and tray may shift inside the lid but won't fall out.

Organize all your sharpening supplies in one convenient place with this easy-to-build, portable storage case.

Before I built this handy case, it took forever to round up all my sharpening supplies. Now, everything I need is conveniently stored in one spot. And I don't have to worry about my waterstones getting damaged.

Don't let the size of this poplar case fool you. It packs a lot into a small space. If you study the illustrations above, you'll discover the case's secret. Special supports on the underneath side of the lid hold a piece of

plate glass for flattening stones, some sheets of silicon carbide paper, and a cookie sheet used as a tray to catch the mess when sharpening.

The case even has space for a shop-made stone holder that can be customized to fit any size tray or stone (see page 63 to learn more).

Dado-and-tongue joinery keeps construction simple. On the next page, you'll see how to cut these strong corner joints on the table saw with only a few setups.

MATERIALS LIST

LUMBER:

- A (2) Box Ends 1/2" x 3 1/2" x 11 1/2"
- B (2) Box Front/Back 1/2" x 3 1/2" x 17"
- C (2) Lid Ends 1/2" x 2" x 11 1/2"
- D (2) Lid Front/Back 1/2" x 2" x 17"
- E (2) Top/Bottom Pan. 1/4" x 11 1/2" x 16 1/2"
- F (2) Dividers 1/2" x 3" x 16 1/4"
- G (2) Edge Strips 1/4" x 3/4" x 16"
- H (2) Spacers 3/8" x 1 7/8" x 11"
- I (2) Tray Supports 1/2" x 1" x 11"

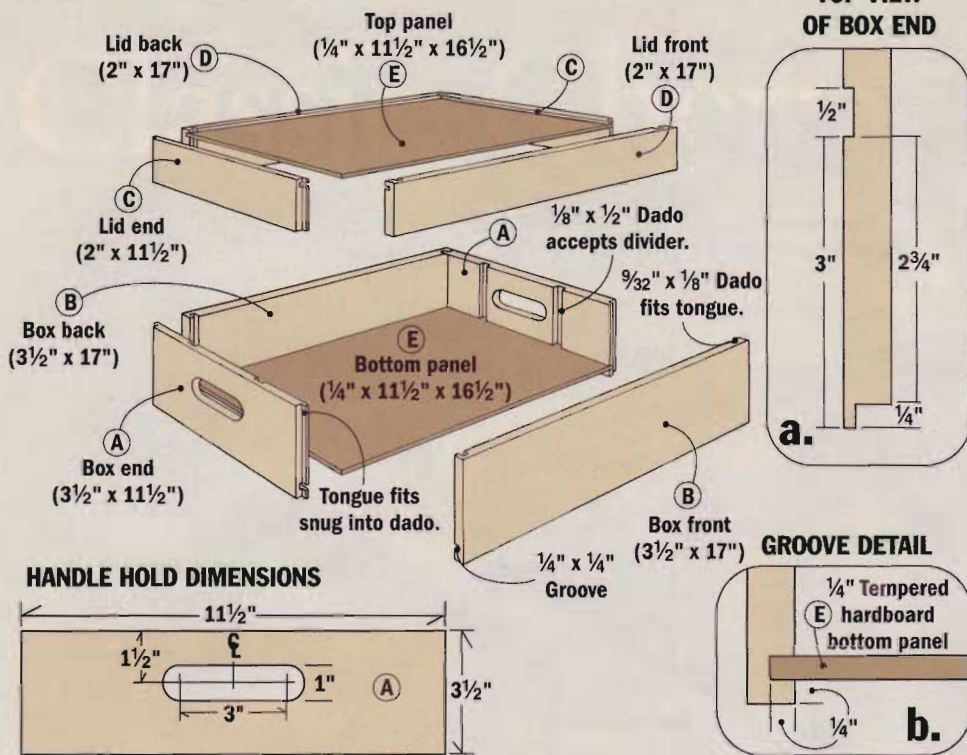
HARDWARE:

- (1) 9x13 Cookie sheet (10" x 14 7/8" overall)
- (4) Plastic turn buttons w/brass screws
- (1) 1/4" x 10" x 12" Plate glass

CUTTING DIAGRAMS:

Turn to page 80 for information about obtaining cutting diagrams for this project.

BOX AND LID ASSEMBLY VIEW



To find the finished length of the fronts (B) and backs (D), add $2\frac{1}{8}$ " to the total length of your sharpening tray. For example: A 9×13 cookie sheet measures $14\frac{7}{8}$ " total length including the edges, so I cut the front and back pieces 17" long.

After cutting all the case parts, I labeled them to make sure I cut the dados and tongues in the correct pieces. You may also want to cut some extra $\frac{1}{2}$ " scrap stock now to use as test pieces.

CUT THE JOINERY

I wanted simple, strong joinery for the case. That's why I chose dado-and-tongue joints that lock the corners together. The technique I use to cut this type of joint on the table saw is explained below in *Cutting A Dado-and-Tongue Joint*.

Don't get discouraged if you have to make some trial cuts to form perfect tongues. Here's where that extra $\frac{1}{2}$ " stock comes in handy. Just remember, tight joints are the reward for your patience.

After the corner joints are cut, you can turn your attention to the dados that accept the dividers, see *Detail a* above. First lay the two box ends (A) edge-to-edge and flush at the ends. Then mark the dado positions. It's a good idea to sneak up on the dado width. (I used a piece of scrap stock for testing the width of the dados.)

If you take a look at the *Assembly View* above, you'll see that this case starts out as simply a shallow box with a matching lid. This simplicity of design is carried through to the joinery techniques.

A word of caution: Before hitting the shop, you should know the overall dimensions of the sharpening tray you plan on using. I

designed my case to fit a common 9×13 cookie sheet ($10" \times 14\frac{7}{8}"$ overall). Your case's dimensions may vary depending on the size of sharpening tray you choose.

MAKE THE CASE PIECES

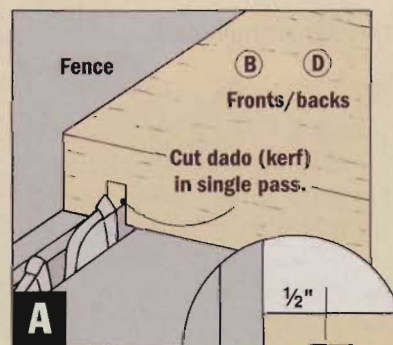
I started building the case by cutting all the box (A-B) and lid (C-D) pieces to size from $\frac{1}{2}$ "-thick stock.

CUTTING A DADO-AND-TONGUE JOINT

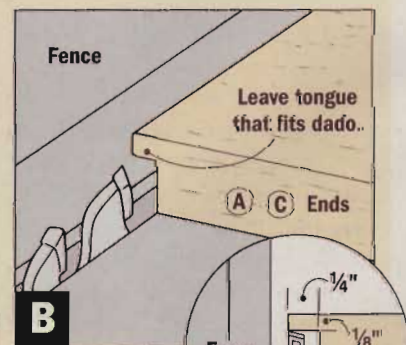


When cutting this joint, start with the dados, see *Figure A*. Be sure to use a miter gauge for all the cuts.

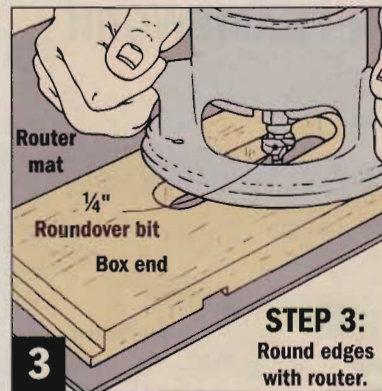
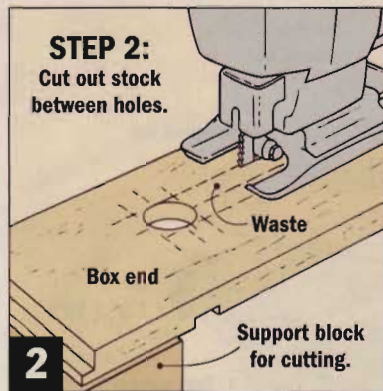
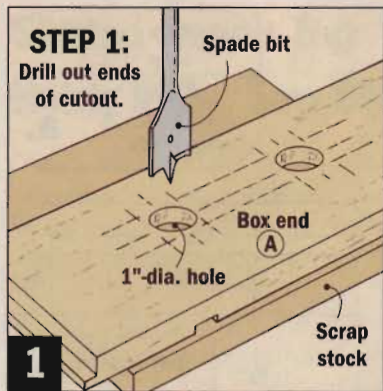
And don't bother installing a dado blade to cut the rabbets. Instead, sneak up on them to form mating tongues. Here's how. Set the fence $\frac{1}{4}$ " away from the far edge of the blade. Raise the blade to leave $\frac{1}{8}$ ". The first cut defines the shoulder of the rabbet. To complete the tongue, scoot the board away from the fence and nibble away waste as shown in *Figure B*.



A Cut the dado just slightly deeper than the length of the tongue so the shoulder will seat.



B A rabbet cut in multiple passes forms the tongue that will mate with the dado.



The joinery is nearly complete except for 1/4" x 1/4" grooves for the top and bottom panels (E), see *Detail b* at left. My hardboard stock was slightly less than 1/4" thick, so I had to sneak up on the groove width by making multiple passes.

With the grooves done, it's time to cut the top and bottom panels to size. Dry assemble the box and lid first to get an accurate measurement.

FORM THE HANDLE HOLDS

Rather than attach separate handles to the case, I chose to cut handle holds right out of the box ends. These 1" x 4" openings serve two purposes. First, they make the case easy to lift and carry. Second, they allow air to circulate throughout, which helps dry out any dampness trapped inside the case.

Start by marking the position of each opening on a box end as indicated in the *Handle Hold Dimensions* on the previous page. Then you can follow the sequence illustrated above in *Figures 1-3* to cut out and clean up the handle holds.

Once the openings are cut, you could simply leave them or soften the edges with sandpaper. I wanted the hand holds to be comfortable to grip and look a little nicer, so I decided to round over the inside and outside lips of the openings as shown in *Figure 3*.

GLUE UP THE BOX AND LID

At this point, the box and lid are ready to be assembled. A tight fit and good glue provide a strong enough joint without screws or brads for reinforcement.

You'll notice in the drawings at the bottom of the page, I found it helpful to glue up the box first so I could use it as a guide for squaring the lid. This works because both parts are designed to be flush on all four sides when fit together.

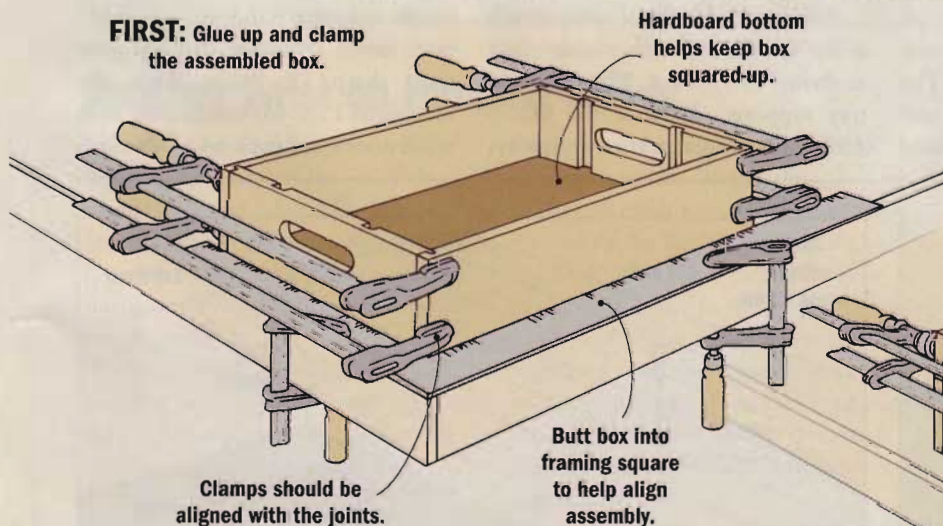
Start assembling the box by gluing together the ends and back. Next, apply glue to the grooves and slide the bottom panel into place. It will help keep the box squared-up.

To close up the box, attach the front piece and draw the joints tight with clamps. Butting the box into a framing square helps with alignment.

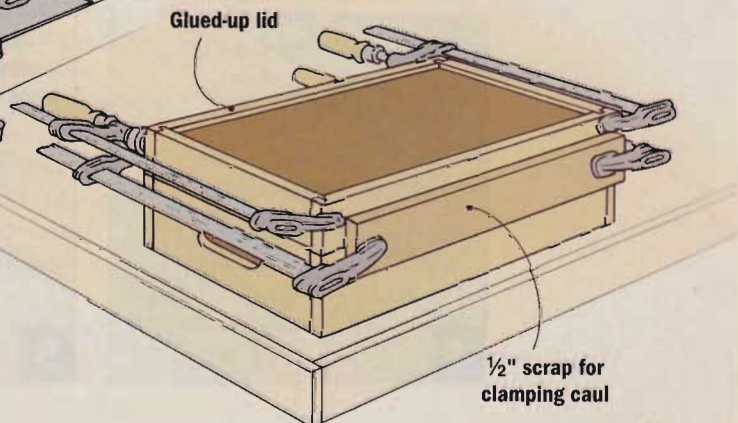
The lid can be assembled in the same order as the box. Once the lid is together, clamp both assemblies as shown below. Be sure you don't glue the two together. Now you're ready to cut the interior pieces.

SQUARING THE BOX AND LID ASSEMBLIES

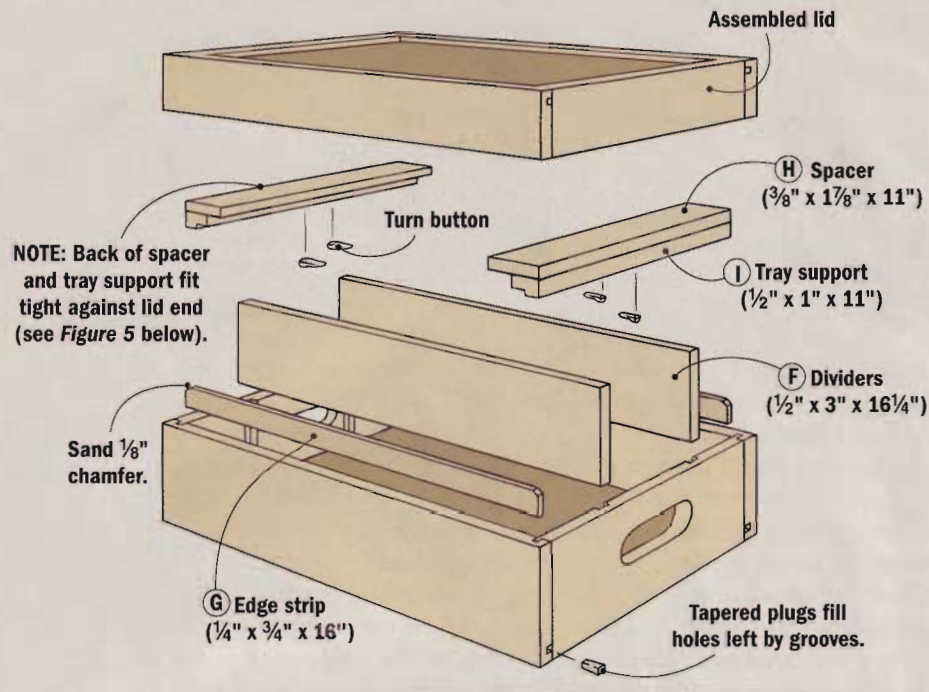
FIRST: Glue up and clamp the assembled box.



SECOND: After the box dries, use it to help square-up the lid. Clamp the case flush while the lid dries. Make sure you don't glue the lid and box together.



INTERIOR FRAMEWORK

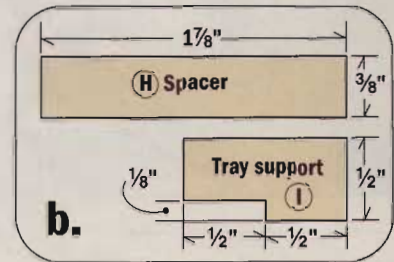
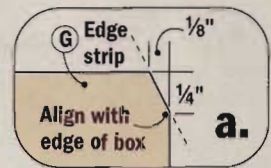


NOTE: Back of spacer and tray support fit tight against lid end (see Figure 5 below).

Sand 1/8\"/>

G Edge strip (1/4\"/>

Tapered plugs fill holes left by grooves.



CUT DIVIDERS AND EDGE STRIPS

To get an idea of how all the interior parts fit into the case, take a look at the drawing above.

Start by cutting the dividers (F) to size from 1/2"-thick stock and fitting them in place. Next, add edge strips (G) to the front and back of the box to hold the lid in place without hinges. To make these, you'll need to resaw (or plane) a 1/2"-thick blank to 1/4". Then rip two 3/4"-wide strips from the blank.

Before attaching the edge strips, I sanded a slight chamfer like the one shown above in *Detail a*. The chamfer helps the lid slide on and off easier. With it sanded, go ahead

and glue the edge strips into the box. An easy way to do this is to line up the bottom of the chamfers with the upper edge of the box and clamp in place.

ASSEMBLE THE LID SUPPORTS

You'll notice above in *Detail b* that there are actually two pieces glued together to hold supplies in the lid. Start by resawing (or planing) some stock to 3/8" thick, then cut two spacers (H) to size.

Next, cut a blank the same length as the spacers and rabbet both edges as shown in *Figure 4*. Then rip two tray supports (I) from the blank. After gluing together the two spacers

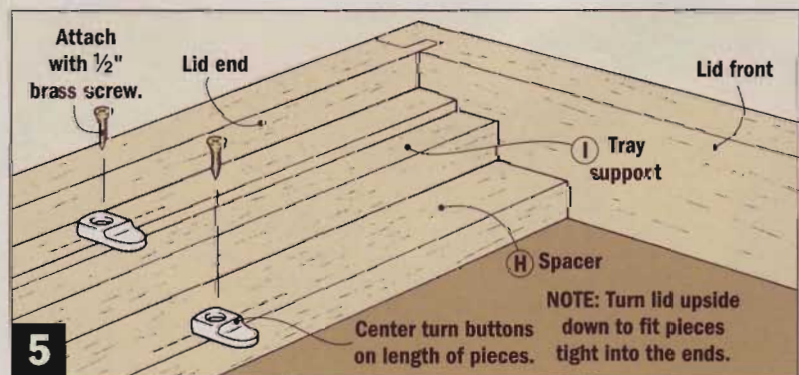
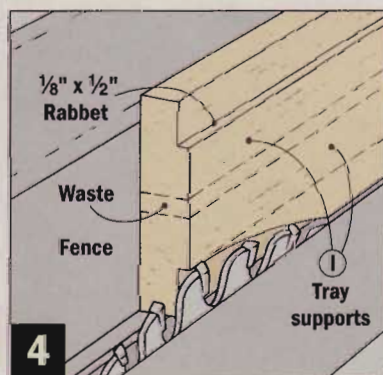
and tray supports, fit them into the lid ends and glue them in place. *Figure 5* shows what your lid should look like with these pieces attached. Wait to install the turn buttons until after you've finished the case.

ADD THE FINISHING TOUCHES

There's one more detail to consider — filling holes in the ends created by the grooves. I used tapered plugs, trimmed flush with the ends.

Before applying a finish, I clamped the box and lid together and softened all the outside edges with an 1/8" roundover bit. Finally, I eased all the inside edges with sandpaper and applied three coats of polyurethane spar varnish. The only thing left is to install the plastic turn buttons that hold the tray, glass, and silicon carbide paper in place.

Now, with all your sharpening supplies close at hand, you shouldn't need much incentive to keep your tools sharp. (To learn about the technique I use for sharpening with waterstones, see page 64.)



NOTE: Turn lid upside down to fit pieces tight into the ends. Center turn buttons on length of pieces.

MATERIALS LIST

A	(2) Box Ends	$\frac{1}{2}$ x $3\frac{1}{2}$ - $11\frac{1}{2}$
B	(2) Box Front/Back	$\frac{1}{2}$ x $3\frac{1}{2}$ - 17
C	(2) Lid Ends	$\frac{1}{2}$ x 2 - $11\frac{1}{2}$
D	(2) Lid Front/Back	$\frac{1}{2}$ x 2 - 17
E	(2) Top/Bottom Panel	$\frac{1}{4}$ x $11\frac{1}{2}$ x $16\frac{1}{2}$
F	(2) Dividers	$\frac{1}{2}$ x 3 - $16\frac{1}{4}$
G	(2) Edge Strips	$\frac{1}{4}$ x $\frac{3}{4}$ - 16
H	(2) Spacers	$\frac{3}{8}$ x $1\frac{7}{8}$ - 11
I	(2) Tray Supports	$\frac{1}{2}$ x 1 - 11

CUTTING DIAGRAM

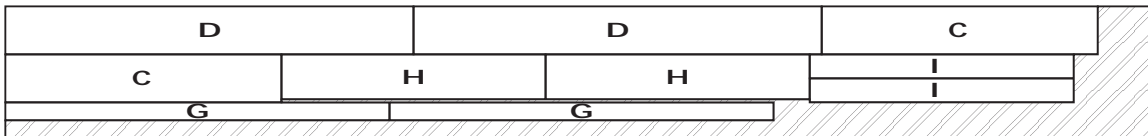
$\frac{1}{2}$ x $3\frac{1}{2}$ - 48"



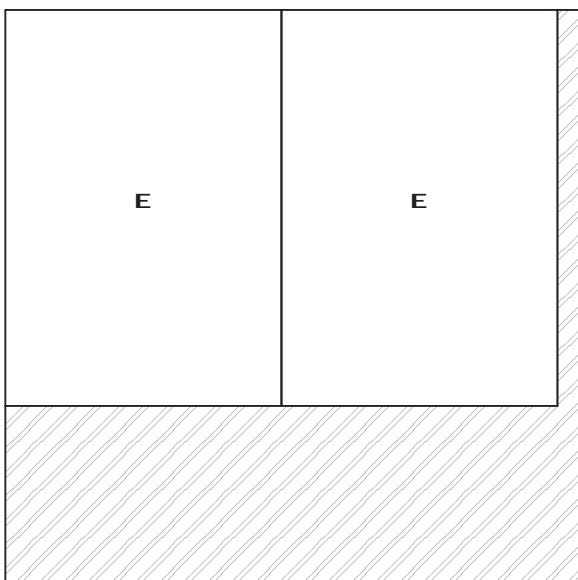
$\frac{1}{2}$ x $3\frac{1}{2}$ - 48"



$\frac{1}{2}$ x $5\frac{1}{2}$ - 48"



$\frac{1}{4}$ x 24" - 24" (HARDBOARD)



Custom Stone Holder

This simple holder is easy to make and can be designed to fit any length sharpening tray and different size waterstones.

Using this shop-made stone holder together with a sharpening tray solves two problems commonly associated with sharpening waterstones. It anchors the stone to prevent it from slipping around. And it also keeps any slurry mess to a minimum.

Of course, there are commercial stone holders available that will do the same job just fine. The nice thing about this one is that it can be custom fit to any size sharpening tray and stone you use. And after finding out how easy it is to make, you'll probably want one for each of your waterstones.

If you take a look at the *Assembly View* at right, you'll see the holder is made up of six pieces of $\frac{1}{2}'' \times \frac{3}{4}''$ aluminum angle held together with stainless steel machine screws and hex nuts. Notice in the photo at the top of the page that the two cleats (A) are cut just shy of the inside length (13'') of the sharpening tray. This is so the holder won't slide around.


The two support brackets (B) hold the stone tight and can be positioned anywhere along the cleats to fit different length stones. The feet (C) are exact duplicates of the support brackets.

GETTING STARTED

You should be able to find aluminum angles at most home centers or hardware stores. They're easy to cut and drill as long as you support the workpieces in a vise.

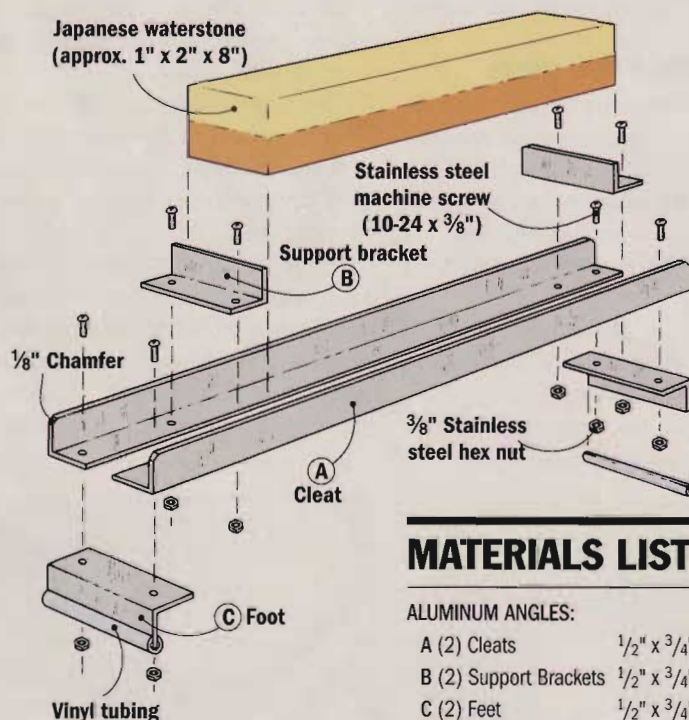
Start by cutting all six angle pieces to size using a hacksaw. Before assembling the pieces, cut chamfers on the corners of the cleats. These will keep you from scraping your hands if you accidentally slip while sharpening. I also removed the burrs

from the edges with a file. A sander would work fine, too. With the pieces supported in a vise, drill all the holes. Now you're ready to assemble the stone holder as shown in the illustration below.

There's one final detail left before you start sharpening. Cut a couple pieces of tubing $2\frac{3}{16}''$ long that fit onto the feet of the holder. These vinyl "slippers" keep the tray from getting scratched and complete this "sharp" stone holder. 



STONE HOLDER ASSEMBLY VIEW



MATERIALS LIST

ALUMINUM ANGLES:

- A (2) Cleats $\frac{1}{2}'' \times \frac{3}{4}'' \times 12\frac{7}{8}''$
- B (2) Support Brackets $\frac{1}{2}'' \times \frac{3}{4}'' \times 2\frac{3}{16}''$
- C (2) Feet $\frac{1}{2}'' \times \frac{3}{4}'' \times 2\frac{3}{16}''$

HARDWARE:

- (8) 10-24 x $\frac{3}{8}''$ Rh stainless steel machine screws with hex nuts
- (2) $\frac{3}{16}''$ vinyl tubing cut $2\frac{3}{16}''$ long

Getting the Edge

Sharpening a chisel to a razor-sharp edge with a waterstone doesn't have to be a mystery. It's just a matter of following a logical step-by-step sequence.

You've got to have the right "touch" to properly sharpen a chisel. But getting a sharp edge requires more than that. You need to follow a number of steps so that both surfaces of the chisel come together at a single point. When they meet perfectly, the chisel is truly "razor-sharp."

FLATTENING A NEW CHISEL

When sharpening a chisel, most people start out wrong by concentrating on the beveled edge first. But actually, the place to start is on the *back* of the chisel. That's because most chisels, even new ones, don't have a flat back.

Notice in the profile drawings below the difference between a chisel with a hollow back, one that's crowned on the back, and one with



a flat back. The only way to get a straight, square cutting edge is to start off with a flat back.

Okay, so what's the best way to flatten the back? I like to start with a sheet of 240-grit silicon-carbide (wet/dry) sandpaper taped to a piece of glass (*Fig. 1*).

After it's taped down, mist the sandpaper with water and hold the chisel perfectly flat on the sandpaper as shown in *Figure 1a*. Now apply even, firm pressure and slide the chisel back and forth. This may feel

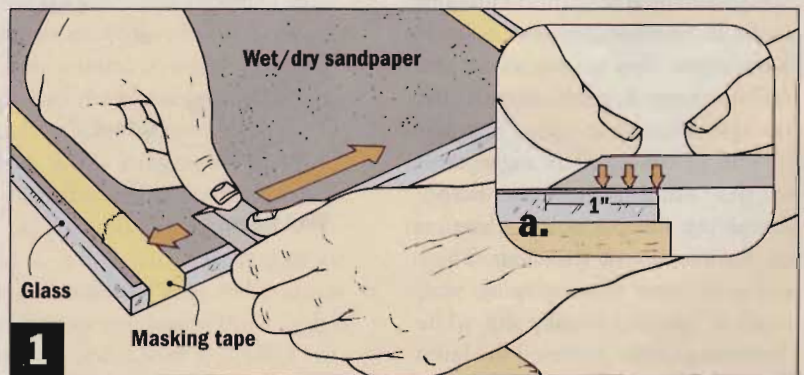
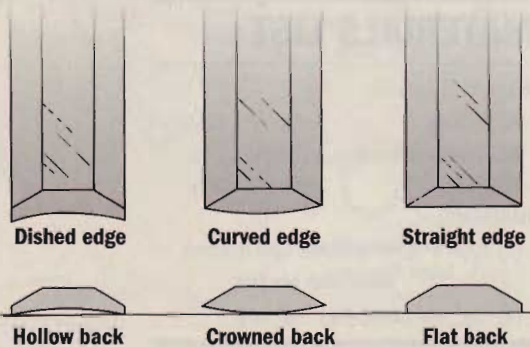
a little bit awkward at first, but soon you'll get into a smooth, comfortable rhythm.

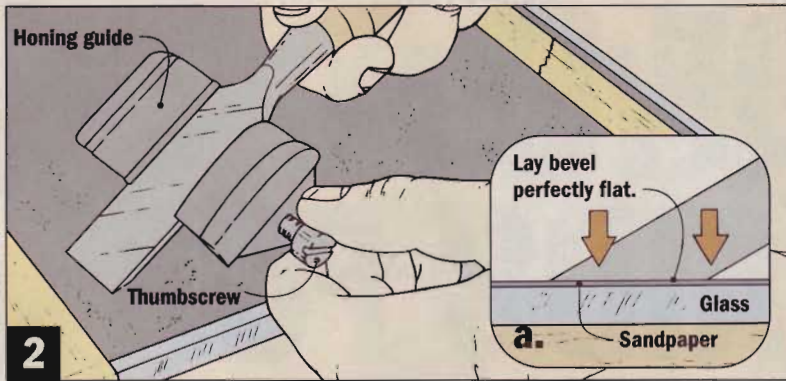
As you work, occasionally check the back of the chisel to see how you're doing. What you're looking for is a consistent gray surface. When it extends clear across the blade, the back is flat.

POLISHING THE BACK

The coarse 240-grit sandpaper works well to flatten the back of the chisel, but it leaves fairly deep scratches. To

CHISEL PROFILES





polish the scratches, you'll need to switch to progressively finer grits of sandpaper. Start with 400 grit and move to 800 grit. Then, to get a mirror finish, I like to give it a final polish with a 1000/6000-grit waterstone.

When using one of these stones, always soak it in water for 10 to 15 minutes before starting. And be sure to keep it wet while sharpening. (See page 80 for sources of waterstones.)

HONING THE BEVEL

Once the back is flat and polished, you can turn your attention to the bevel. The steps for honing the bevel are the same as flattening the back.

Start with 240-grit sandpaper, work through progressively finer grits, and then finish on a 6000-grit waterstone.

This time, though, it's easier if you use a honing guide like the one shown in *Figure 2*. The guide helps hold the chisel at a consistent angle. To mount a chisel in the honing guide, hold the bevel flat on the sandpaper as shown in *Figure 2a*. Then adjust and tighten the thumbscrew on the guide so it holds the chisel at that angle.


Using a honing guide takes a little different touch. Take a look at the photo on the previous page and then *Figure 3* and notice how my index fin-

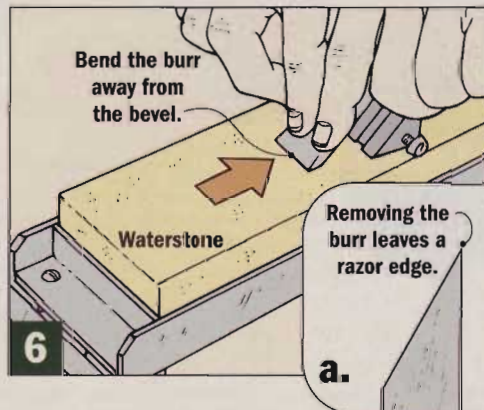
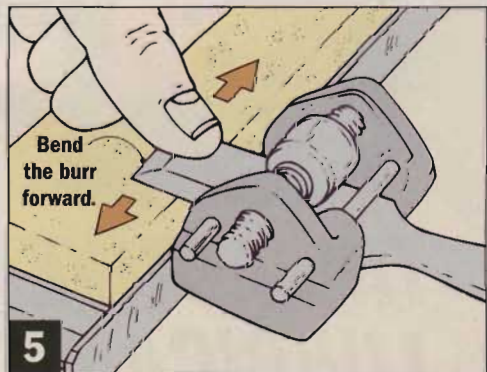
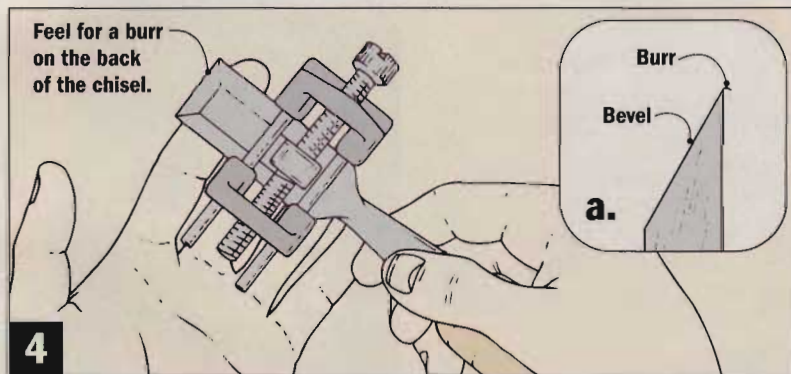
gers press down on the chisel while my thumbs control the guide. Then it's a matter of just using a consistent back-and-forth rhythm. After uniform scratches cover the entire bevel, move on to the next grit.

REMOVING THE BURR

As you're sharpening the bevel, occasionally stop and run your finger across the back of the blade like in *Figure 4*. You should feel a small hook at the end of the blade called a burr (*Fig. 4a*). Removing the burr is kind of like bending a piece of wire until it breaks — first you bend it one way and then the other until it weakens and snaps off.

To bend the burr away from the back, stroke the blade over the waterstone as shown in *Figure 5*. Now bend it back with the bevel down (*Fig. 6*). Alternate back and forth this way until the burr breaks off.

The best way to test whether a chisel is really sharp is to actually use it. I like to make a straight cut down through end grain — with only hand pressure. If the result is a glass-smooth surface, it's razor sharp. 



A well-sharpened chisel will peel away a smooth ribbon of wood — even from end grain.

In The Shop

Fitting Inset Cabinet Doors

Inset doors, like those on the *Classic Cherry Cabinet* (page 30) and the *Gourmet Grilling Center* (page 46), fit flush with the front of the carcass. And the gap between the doors and the surrounding case must be uniform on all sides. This sounds complicated, but you can get great results by following these simple steps.

SIZE THE DOORS TO THE OPENING

Unless you're a master cabinetmaker or just plain lucky, the opening in your cabinet will probably be slightly out of square. That's okay.

Measure the opening to find the maximum height and width, then build your doors to fit those dimensions. Be sure to keep the doors square and flat during glue-up to simplify fitting.

DETERMINE THE GAP

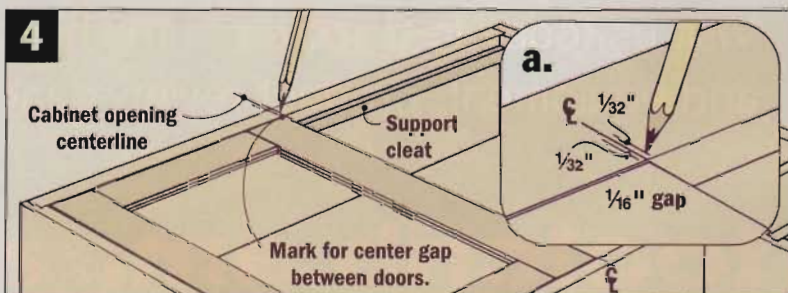
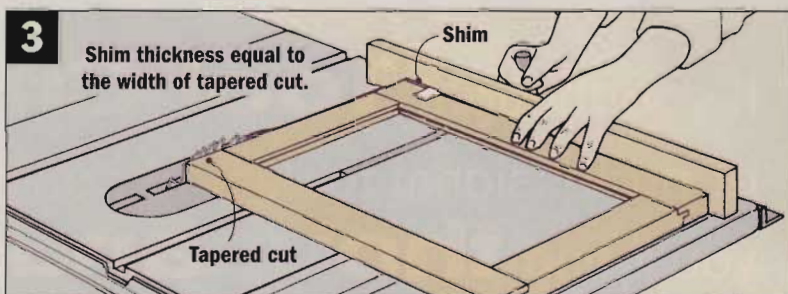
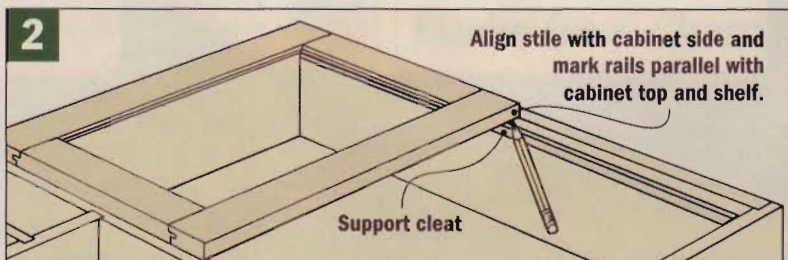
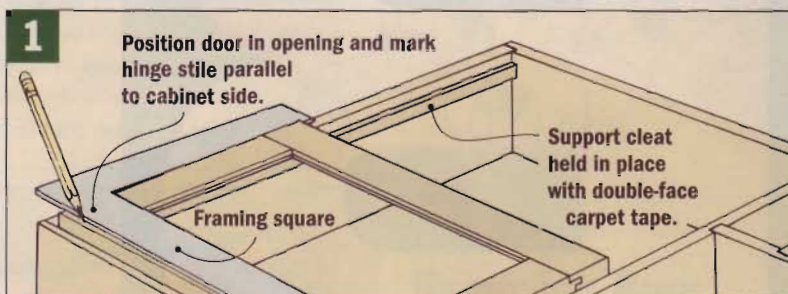
For small cabinets, the gap around the door should be $\frac{1}{16}$ ". For larger cabinets or for outdoor projects subject to moisture (like the *Grilling Center*), I usually leave a $\frac{1}{8}$ " gap.

FINE-TUNE THE FIT

The easiest way to fit doors is to lay the cabinet on its back. If necessary, support the doors in the opening by attaching cleats to the case or face frame using double-face tape as shown in *Figure 1*.

If the door fits at the top and bottom, slide the hinge stile against the side of the case (*Fig. 1*). There's probably a small gap at either the top or the bottom. Measure the gap, then mark the stile opposite the gap to be trimmed by that amount.

If the door won't fit in the opening at the top and bottom, position the hinge stile against the case and center the door in the opening top-to-bottom (*Fig. 2*). Then carefully mark the door along the edges of the case.



To true up the doors, plane them down to the line you marked or use a shim to make a tapered cut on the table saw (*Fig. 3*).

TRIM FOR THE CENTER GAP

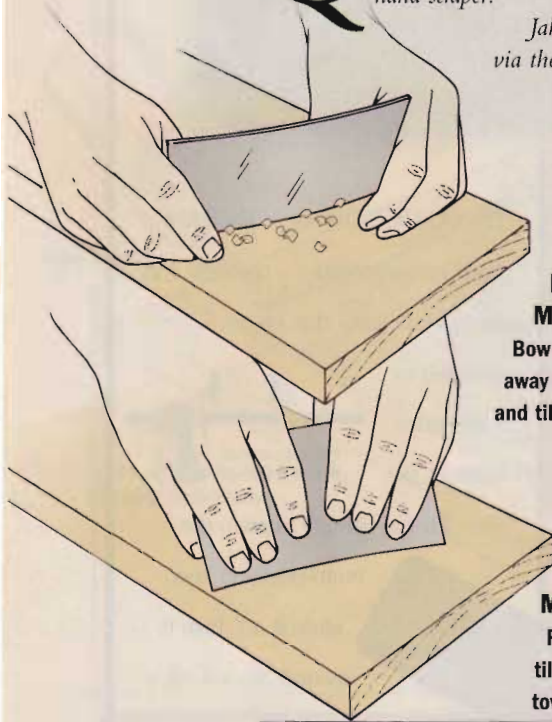
If you plan to mortise in the hinges, now's the time to do it. Install the hinges so you leave a uniform gap along the hinge stile. To establish the gap between the

doors, mark the centerline of the cabinet opening on the case at both the top and bottom (*Fig. 4*). Mark half the width of the gap ($\frac{1}{32}$ " in this case for a $\frac{1}{16}$ " gap) on either side of the centerline. Now, transfer the gap marks to the door at the top and bottom. Use a straightedge to connect the marks, then trim the door to the line. Then repeat the process for the other door(s).

Should You Push or Pull a Hand Scraper?

Q Does it make any difference whether you push or pull a hand scraper?

Jake Austin
via the Internet



PUSH METHOD
Bow scraper
away from you
and tilt forward.

PULL METHOD
Flex and
tilt scraper
toward you.

A Before discussing pushing or pulling, let me start by talking about scrapers in general. A hand scraper is simply a small thin piece of tempered steel with a burr along one edge. It's often the first tool I choose to remove burn marks, mill marks, and scratches.

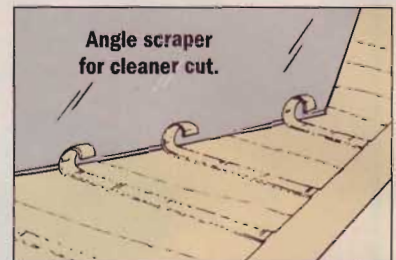
And don't let the name fool you. A scraper slices fine ribbon-like shavings similar to a plane rather than scraping up sawdust.

As for how to use a scraper, there aren't any rules. Hold it between your thumbs and forefingers at an angle of about 50 to 70 degrees or until you feel the burr on the scraper edge catch. Then push or pull it, depending on what feels best.

Pushing a scraper allows you to use your body weight, which helps remove more stock quickly. I also

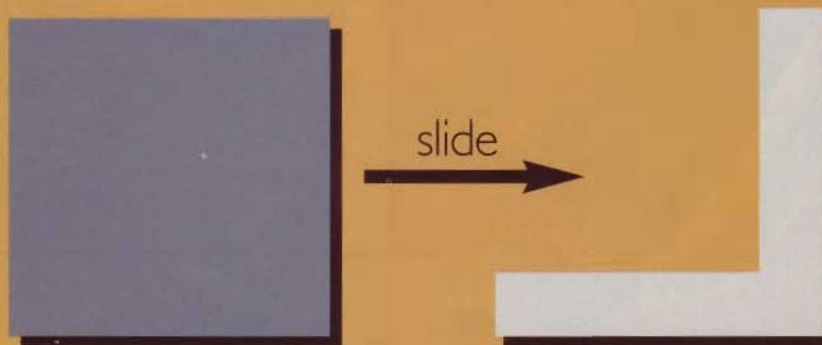
find it easier to keep a scraper flexed to a uniform bow when pushing. On the other hand, I like the control pulling gives me because I can remove thinner shavings. Either way, find what's comfortable for you.

One final trick I use when removing mill marks is to "skew" the scraper at a slight angle to the washboardlike rows. Take a look at the illustration below and you'll see why. Skewing allows the scraper to cut off the ridges rather than dip in and out of the hollows.



Angle scraper
for cleaner cut.

We make it simple.



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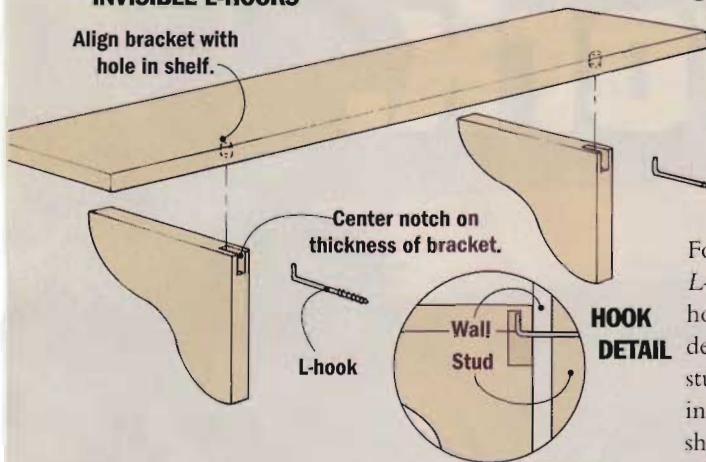
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in the correct proportion,
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and your Benjamin Moore
dealer will give you all
the expert advice you need.

Around The House

Hang Shelves with Three Different Invisible Systems

INVISIBLE L-HOOKS

Align bracket with hole in shelf.



Center notch on thickness of bracket.

L-hook

HOOK DETAIL

Three-board wall shelves are simple to build and attractive. To keep their looks uncluttered, over the years I've used several shop-built hanger systems that are secure but invisible from the front.

INVISIBLE L-HOOKS

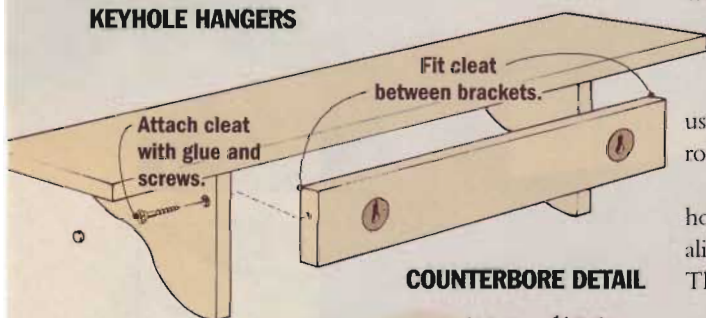
For lightweight shelves, the *Invisible L-Hook* system works great. The hooks, available in any hardware department, get screwed into wall studs or drywall anchors and hook in holes in the underside of the shelf. The *Hook Detail* at left shows what's really unique about this system — the hooks are hidden in notches in the shelf brackets.

Making the notches is easy using a $\frac{1}{4}$ "-dia. straight bit in a router table.

Once the notches are cut, drill holes in the bottom of the shelf to align with the bracket locations. Then connect the shelf and brackets.

To mount the shelf, first screw the L-hooks into the wall. Then hang the shelf. Adjust the hooks to snug the shelf against the wall.

KEYHOLE HANGERS



Fit cleat between brackets.

Attach cleat with glue and screws.

COUNTERBORE DETAIL

1"-dia. x $\frac{1}{4}$ "-deep bore

$\frac{1}{4}$ "-dia. x $\frac{1}{8}$ "-deep bore

$\frac{1}{4}$ "-dia. hole

$\frac{1}{8}$ "-dia. holes

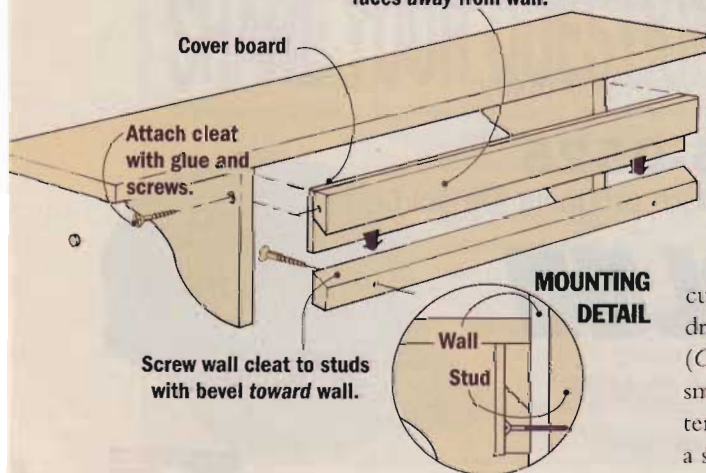
Brad

$\frac{1}{8}$ "-thick x $\frac{1}{4}$ "-dia. plug

Roundhead screw

INTERLOCKING CLEATS

Bevel on shelf cleat faces away from wall.



Cover board

Attach cleat with glue and screws.

Screw wall cleat to studs with bevel toward wall.

MOUNTING DETAIL

Wall Stud

KEYHOLE HANGERS

The *Keyhole Hanger* system is also great for shelves that won't bear a lot of weight. This system starts with a cleat running under the shelf and between the brackets. The cleat has stepped holes that accept plugs made of $\frac{1}{8}$ "-thick hardboard. Keyhole-shaped slots in the plugs slip over round-head mounting screws in the wall. You can see this in the *Counterbore Detail*.

After cutting a cleat to size, cut the stepped hole by first drilling the shallow outer bore (*Counterbore Detail*). Then drill the smaller-diameter inner bore, centered in the larger one. This creates a shoulder to receive the plug.

Now cut the plug to size. A jigsaw works, but I prefer to use a hole saw, which also creates the $\frac{1}{4}$ "-dia. centered hole that's needed. (If you don't use a hole saw, drill the hole after cutting the plugs.) Next, create the keyhole shape by drilling two $\frac{1}{8}$ "-dia. holes directly above the first hole. Then connect the holes by filing between them.

Now glue and nail the plugs in place, with the narrow keyhole sections pointing up. Finally, mount the cleat to the shelf. Then drive screws into the wall, and hang the shelf.

INTERLOCKING CLEATS

The *Interlocking Cleat* system also has a cleat attached between the shelf brackets. But the lower edge of the cleat is beveled at 45° . This cleat interlocks with a second beveled cleat mounted to the wall. To keep this system "invisible," there's a thin cover board.

I like this system for two reasons. First, the mounting screws in the wall cleat can be located anywhere on the cleat's length. That lets you screw into wall studs even if the shelf isn't centered on a stud cavity. Second, by screwing the wall cleat to the studs, this system will bear a lot of weight — I've even hung kitchen cabinets this way.

Construction couldn't be simpler. Just rip a piece of stock with the table saw blade tilted to 45° .

Now lay the beveled pieces together and measure their overall width. Make a cover by cutting a $\frac{1}{4}$ "-thick board to match.

Next, glue and screw one piece to the shelf with the bevel facing forward, as shown in the *Mounting Detail*. Then glue on the thin cover.

Finally, mount the other cleat to the wall. Make sure the bevel faces toward the wall, and the cleat is level before screwing it to the studs.

Quick Countertop Dress-Up

A great way to add flair to a kitchen is to update the countertops. But replacing them can be pricey. Plain laminate counters usually run \$8-\$10 per linear foot, and laminate counters trimmed with hardwood can be \$4 to \$6 more.

But by using a router and three basic bits you can inlay hardwood edging in a standard countertop. The methods shown at right work the same for new counters or to liven up the counters already in place.

Step 1: Using a rabbeting bit, cut away the countertop's front edge (Fig. 1). I usually cut a $\frac{3}{8}$ " x $\frac{3}{8}$ " or $\frac{1}{2}$ " x $\frac{1}{2}$ " rabbet. This rabbet receives the hardwood edging.

Step 2: Cut a strip of hardwood edging to fit in the rabbet. Choose a wood that matches your cabinets, or one that will accent them well. And try to cut strips long enough

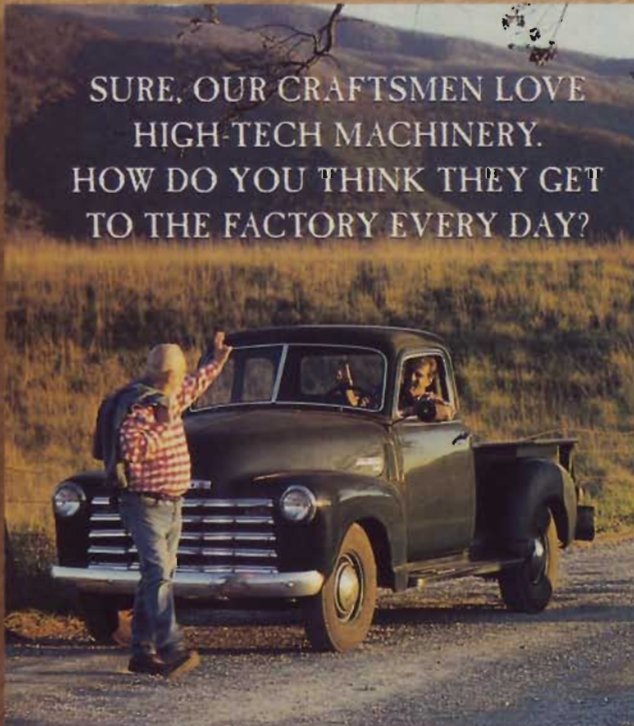
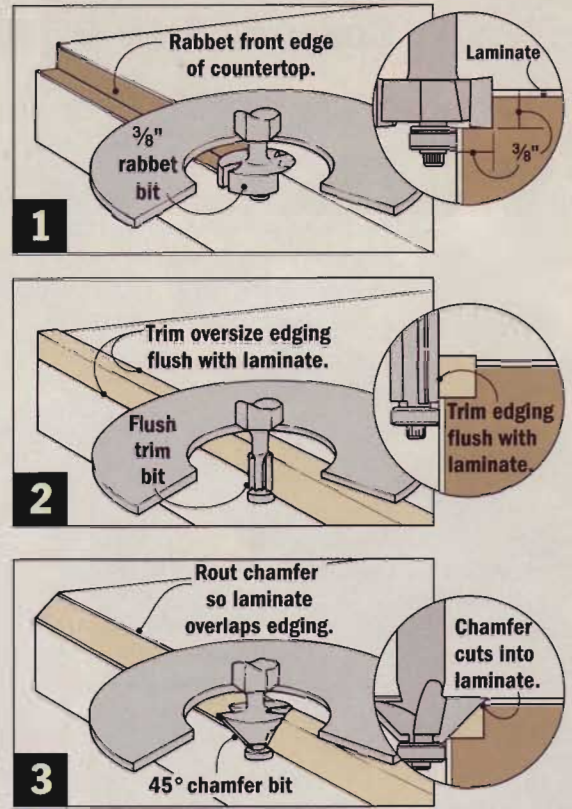
that there won't be any seams along a run of counter. Also, make the strips $\frac{1}{16}$ " larger than the rabbet, so they protrude above the counter surface and beyond the front edge.

Step 3: Now glue the strips in place. Masking tape or packing tape will hold them in place while the glue sets. At the corners, the strips can be mitered for the best look, or simply butted.

Step 4: After the glue sets, use a flush trim bit (with a bearing mounted below the cutter) to trim the edging flush with the edge and face of the counter (Fig. 2).

Step 5: Now profile the edging using a 45° chamfer bit (Fig. 3). Cut just deep enough to expose the edges of the laminate.

To complete the project, stain the edging if necessary, then apply a water-resistant finish.



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Concrete Stair Repair

Concrete repairs can be simple. Even damaged stairs, like those shown here, are easy to fix.

Repair materials needed, such as patching cement, concrete cleaner, and bonding adhesive, are available in home centers. And a wire brush, a cold chisel, a trowel, and scrap wood for forms may already be lying around your shop.

For the repair to last, the area needs to be solid and clean. Start by using a cold chisel and hammer to remove cracked or loose concrete (Figure 1). Next, scrub the area using concrete cleaner and a wire brush.

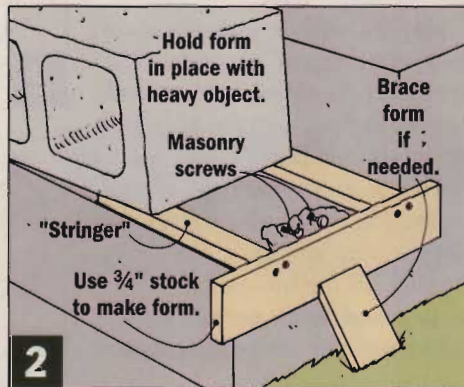
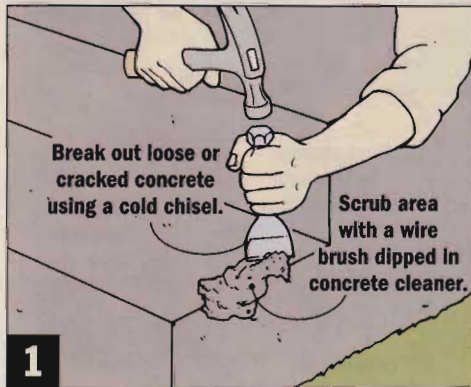
If the repair is shallow (less than 2") you can move on to patching. If the damage is deeper, one trick is to reinforce the patch by adding

masonry screws as "rebar," (Fig 2). Drill holes and epoxy the screws in, making sure the heads sit at least 1/2" below the finished surface.

For stairs I prefer using quick-setting cement, which sets in just 10 to 20 minutes. I use a simple form made up of two "stringers" screwed to a board to make a form that "hangs" on the step. Before using the form, spray it with non-stick cooking spray so it will come off easily once the concrete sets.

Now mix the cement and trowel it into place. To get a strong bond, push the mix hard into the area.

Once the concrete firms up (but before it dries completely) finish the surface. A trowel makes a smooth surface, while a sponge or broom yields a rougher texture. After the patch sets, remove the form and apply concrete sealer to the patch.



HEAVY-DUTY MOBILE BASES & ROLLER STANDS



D2056 TOOL TABLE
Support cross braces on top provide incredible strength and capacity. Flared legs and adjustable rubber feet ensure stability while reducing machine vibration. Butcher block finish table top measures 13" x 23" and is 30 1/2" tall. **700 lb capacity**

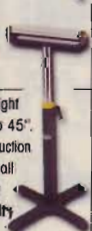


D2275 TOOL STAND
This sturdy universal tool stand measures 24" tall, 27 1/2" x 31 1/2" at the base and 17 1/2" x 22" at the top. Includes non-slip rubber feet. **1,000 lb capacity**



D2273 SINGLE ROLLER STAND

- Adjusts in height from 26 1/2" to 45"
- All-steel construction
- 15 1/2" wide ball bearing roller
- **250 lb capacity**



D2272 TILTING ROLLER STAND

- Adjusts in height from 25 1/4" to 43 1/4"
- Rollers Tilt from 0° to 45°
- All-steel construction
- 5 1/2" wide ball bearing rollers
- **150 lb capacity**



D2274 5 ROLLER STAND

- Adjusts in height from 26" to 45"
- All-steel construction
- 15 1/2" wide ball bearing rollers
- **250 lb capacity**



D2271 ROLLER TABLE

Features all-steel welded construction and measures 19" wide x 65" long. Comes with 9 ball bearing rollers. Adjustable in height from 26 1/2" to 44 1/2". **1000 lb capacity**

D2060 MINI MOBILE BASE

- Adjusts from 10 1/2" x 14 1/2" to 17" x 21 1/2"
- **600 lb capacity**



D2057 HEAVY-DUTY MOBILE BASE

- Adjusts from 19" x 20 1/2" to 29 1/2" x 29 1/2"
- **800 lb capacity**



D2058 SUPER HEAVY-DUTY MOBILE BASE

- Adjusts from 18" x 24 1/2" to 28 1/2" x 33 1/2"
- **1200 lb capacity**



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Sources & Resources

Waterstones and Honing Guides

If you build the *Sharpening Store-All* (on page 58), you'll want to have a sharpening stone on hand first so you can customize the case and stone holder to fit it. When we went shopping for waterstones, most of them were roughly 1" x 2" x 8" though the actual dimensions of the stones varied slightly.

The Japanese stone we chose was a 1000/6000 two-stage, combination stone. It's available from *Wörkbench Project Supplies* (\$29.95 plus S&H).

To order call (800) 311-3994 and ask for Part No. 5004104 (Key B060). The Japan Woodworker carries a 1000/6000 Japanese waterstone. To order, call (800) 537-7820 and ask for Part No. 01.096.

Wörkbench also offers a comparable American-made stone, suitable for water or oil, in fine/extra-fine grit (\$10 plus S&H, Part No. 363580).

The Steelex Model D1044 hon-



ing guide holds both chisels and plane irons and is simple to set up and easy to use. Order it (Part No. 5004106) from *Wörkbench* for \$12.95 plus S&H.



Grilling Center Hardware

The H-shaped hinges and ring-shaped pull used on the *Gourmet Grilling Center* (page 46) are available by mail order through Horton Brasses. You'll need four pairs of hinges — eight total — (Part No. HH-2) in the 2½" size and four door pulls (Part No. MS-13). To order, call (800) 754-9127.

Got Milk Paint?

For the *Country Style Finish* on page 39, we used a dry powder you mix with water. The mix is from The Old-Fashioned Milk Paint Co. Call (508) 448-6336 for a dealer near you.

It's available in 16 colors and comes in 6 oz. (pint), 12 oz. (quart) and 48 oz. (gallon) size packages. Mix up only the amount you'll



use, since it hardens quickly and becomes unusable if left overnight.

Shop Vacuums and Accessories

Contact the companies below for shop vacuums and accessories:

Craftsman (800) 377-7414
www.sears.com/craftsman

Genie (800) 354-3643
www.geniecompany.com

Ridgid (800) 474-3443
www.ridgidwoodworking.com

Shop-Vac (570) 326-3557
www.shop-vac.com

W. L. Gore Co. (800) 758-6755
www.gore.com/cleanstream

Mahogany Dowels

You may be able to find oak dowels at your home center, but the 1¼"-dia. mahogany dowel used for the handle on the *Gourmet Grilling Center* is harder to find. We got ours from Woodworkers Supply of New Mexico at (800) 645-9292. Ask for Catalog No. 864-108.

Click for Project Cutting Diagrams

Free Cutting Diagrams are available for the *Gourmet Grilling Center*, the *Bathroom Cabinet*, and the *Sharpening Store-All*.

Just log on to:
www.WorkbenchMagazine.com
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If you don't have Internet access, send a self-addressed stamped envelope to:

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Write clearly on the envelope which diagram(s) you want.

Masterful Marquetry

Inspired by observing nature, a California craftsman uses furniture surfaces to inlay images captured in rare and exotic woods and semi-precious stones.

Finding images is only half the battle for artist and furniture designer Paul Schurch. Making the right piece of furniture to properly frame each picture becomes the real challenge for this highly skilled craftsman.

"The marquetry and furniture framework must complement each other," Schurch says.

To find the right balance, Schurch starts every project with full-scale drawings. Sometimes spending months at the drafting table, he finalizes every detail down to the exact effect of light and shadows.

After transferring an image onto the backside of the veneers, Schurch cuts the background and the individual pieces together. Then these pieces are assembled like a giant jigsaw puzzle to create a single veneer "skin." Finally, the skin is glued onto a piece of furniture all at once. Any stone — like the marble bird at left — is inlaid after the marquetry is glued down.

To provide depth to the satinwood ribbons in the mahogany chest shown below, Schurch scorched the veneers by dipping

the edges in hot silver sand. This technique, known as "sand shading," makes the ribbons stand out against the Swiss steamed pear background and walnut burl borders. The banding on the chest is tulipwood, maple and black pear.

Schurch spends from three months to a year on most projects. Prices typically start around \$3,000. He once spent years on a 14-ft. dining table inlaid with exotic wood and semi-precious stones — final price \$80,000. But then Schurch isn't just building furniture. He's creating masterpieces in wood — literally piece by piece by piece.

Paul Schurch owns Schurch Woodwork in Santa Barbara, CA.

