

SIMPLE & STYLISH

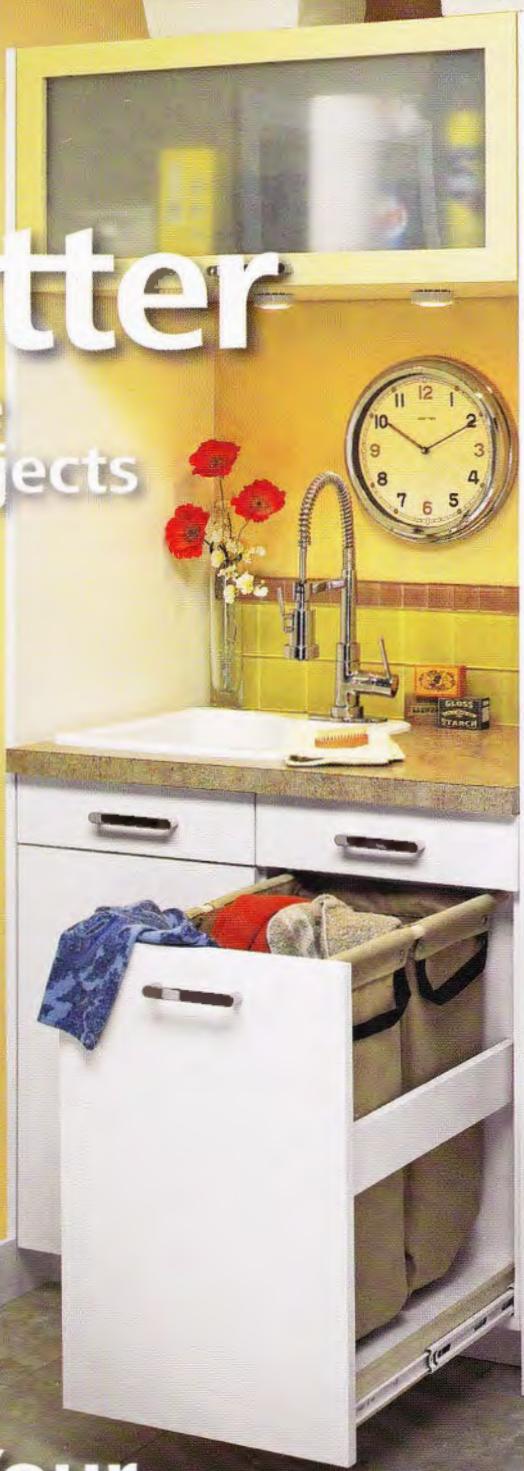
Storage Solutions

FOR EVERY ROOM IN YOUR HOME

Clear the Clutter

15 Easy Home Storage Projects

- » Space-Saving Kitchen Organizers
- » Bath Storage on a Budget
- » Clever Cures for Cramped Closets



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Laundry Room Today!**
—*save space, save time, save money*

350+ STEP-BY-STEP
PHOTOS &
ILLUSTRATIONS

SIMPLE & STYLISH

StorageSolutions

FOR EVERY ROOM IN YOUR HOME

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editor's notes

Get organized! It's a goal that's at the top of the "to do" list for many homeowners I know. Which explains why the home centers are filled with storage and organization products that are designed to help you do just that.

The only downside to these products is they often have a mass-produced, one-size-fits-all appearance, which makes it difficult to create the truly distinctive touches that make a home unique.

That's where *Simple & Stylish Storage Solutions* comes in. It's all about "storage with style." Custom projects that not only help you get organized, but make your home look good doing it.

The book nook featured on page 42 is a good example. It transforms a bare-bones room into a comfortable reading retreat complete with shelving, seating, and lighting. In short, it's your classic built-in that looks as though it has been part of the house since the day it was constructed.

Now, if you were to hire a professional carpenter to add that type of built-in storage, you'd expect to pay a bundle. Fortunately, that isn't necessary. Like all the projects in *Simple & Stylish Storage Solutions*, the book nook has a simple, straightforward design that makes it extremely easy to build. And you can do it using standard woodworking tools and off-the-rack materials from the home center.

To make building the projects even easier, we've included over 350 detailed photos and illustrations in this book. You'll also find sound step-by-step advice to walk you through the entire building process from start to finish. That means you can expect smooth, trouble-free assemblies as you go about building these projects, and of course, stylish storage for your home when you complete them.

Oh, and by the way, if you like these projects, be sure to try out *Workbench* magazine and get even more great home improvement ideas delivered to your door.

Tim



Visit WorkbenchMagazine.com
to subscribe today!

PROJECTS

kitchen



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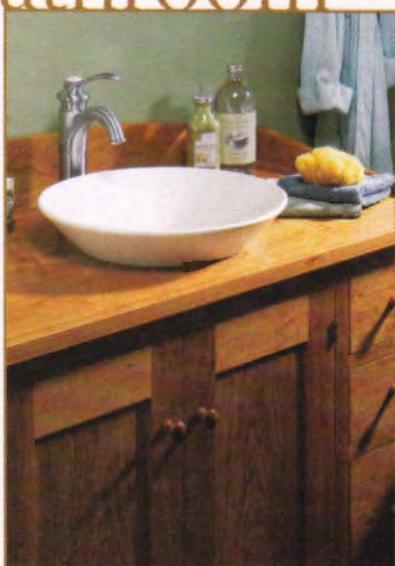
Drop-Down Kitchen Storage Trays

Create much-needed storage in a cluttered kitchen by utilizing the space underneath your cabinets.

"If you're looking for more storage in the kitchen, don't overlook the space underneath the cabinets."
- page 4

"Bathrooms have changed. Once strictly functional spaces now have 'furnished,' contemporary appearances."
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bathroom



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Cherry Bathroom Vanity

This elegant, furniture-inspired vanity looks equally at home in a traditional or contemporary bath setting.

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Contemporary Bathroom Suite

Maximize storage and style in a small bathroom with this suite of three great-looking, easy-to-build projects.

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Space-Saving Drawer Dividers

Solve the problem of overcrowded drawers with easy-to-build dividers that adapt for a perfect fit.

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Tile and wood combine in this simple project to provide display space and give your counters a whole new look.

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Stowaway Storage Loft

This simple loft adds easily accessible storage space to your garage in an area you may have overlooked—overhead.

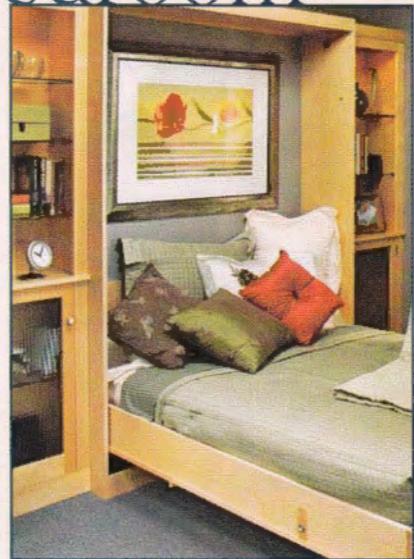
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These inexpensive pine shelves handle heavy loads. Their modular design makes it easy to add shelves as your storage needs grow.

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A big bed can monopolize even the most spacious bedroom. Eliminate the problem with a hideaway bed that folds down from the wall.

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Take the hassle out of closet organization with this simple system. It uses readily available materials to enhance a closet's existing space.

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reclaim your kitchen

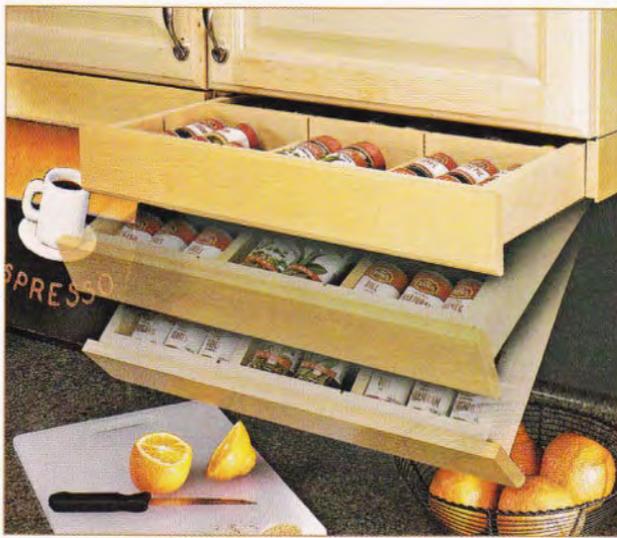
Even with all those cabinets, it's amazing how quickly storage space disappears in today's kitchen.

We solved the problem by finding more space in unexpected places: underneath the cabinets, behind the counter, and inside already crowded drawers.



4
13
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Drop-Down Storage Trays
Drawer Dividers
Kitchen Display Rail



DROP-DOWN kitchen storage

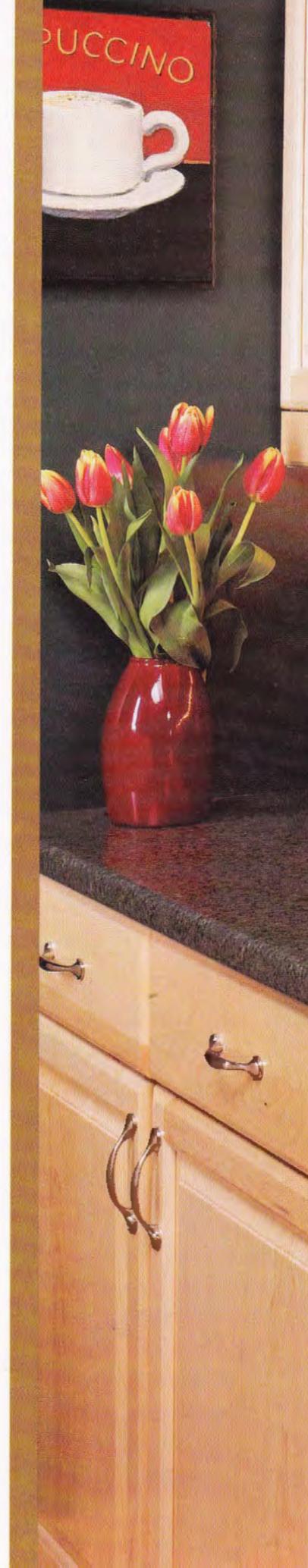
If you're looking for more storage space in your kitchen, then don't overlook the space underneath the cabinets. These unique trays pull out like drawers and then "drop down" at an angle to hold spices, knives, cookbooks, and other items. Your supplies are always close at hand, and your counters stay clear while looking great.

When it comes to the kitchen, you can never have too much storage. But after every available cabinet, drawer, and scrap of countertop space is crammed with pots, pans, dishes, and utensils, one simple question remains: Where do you find more space?

The solution is to find space in an area that most people overlook, but at the same time is remarkably easy to convert into useable storage. We're speaking, of course, about the space *underneath* the cabinets.

Drop-Down Trays—In this kitchen, we've mounted four storage trays in that under-cabinet space (*Photo, right*). These trays pull open like regular drawers, and then drop down at an angle and lock in place.

Custom Storage—But there's a lot more to these trays than their unique drop-down design. With the options that begin on page 10, you can configure the trays into a spice rack, a cookbook holder, or even a place to store knives. All of this keeps the items you need the most tucked neatly away—and your countertops clear.





chicken alfredo
lasagna

option

Fleischmark-Cotta

1000 g

ca. 1000 g

CONSTRUCTION VIEW

Mounting Plate
attaches to underside of cabinet

Kitchen Cabinet

Rails
enclose sides of tray and let it slide in and out

#6 x 1" Fh Woodscrew

#6 x 3/4" Drywall Screw

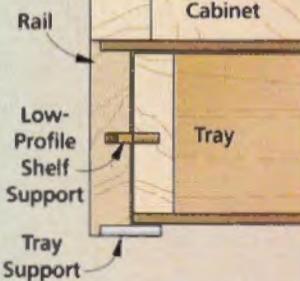
Tray Back

Rail

Groove
forms a track for shelf supports in tray sides, enabling the tray to slide and tilt down

Aluminum Tray Supports
create lip that holds tray

TRAY DETAIL



Storage Tray
slides out, then drops down at an angle

Tray Side

Tray Front
False Front
covers ends of tray sides

Dividers
are used to customize trays
for spices or knives
(see page 10)

MATERIAL LIST

Part	Qty	Size	Material
A RAILS	2	1/2" x 2 1/8" x 11 1/2"	Maple
B FILLER STRIPS	2	1/8" x 5/16" x 1 1/4"	Maple
C MOUNTING PLATE	1	1/8" x 11 1/2" x 17 3/4"	Hardboard
D TRAY SUPPORTS	2	1/8" x 3/4" x 9 5/8"	Alum. Bar Stock
E TRAY SIDES	2	1/2" x 2" x 11 1/2"	Maple
F TRAY FRONT	1	1/2" x 2" x 16 1/16"	Maple
G TRAY BACK	1	1/2" x 1 1/8" x 16 1/16"	Maple
H TRAY BOTTOM	1	1/8" x 11 1/2" x 16 1/16"	Hardboard
I FALSE FRONT	1	1/2" x 2 5/8" x 17 7/8"	Maple
SPICE RACK			
J TRAY DIVIDER	1	1/2" x 2" x 16 3/8"	Maple
K DIVIDERS	4	1/2" x 1 1/8" x 5 1/4"	Maple
L SLATS	6	1/8" x 1 1/8" x 5 3/16"	Hardboard
KNIFE RACK			
M TRAY DIVIDER	1	1/2" x 2" x 16 3/8"	Maple

Part	Qty	Size	Material
N SMALL HOLDERS	2	1/2" x 1 1/8" x 5 1/4"	Maple
O LARGE HOLDERS	2	1/2" x 1 1/8" x 5 1/4"	Maple
P KNIFE BLOCK	1	1/2" x 5" x 4 5/16"	Maple
Q HANDLE BLOCKS	4	1/2" x 1 3/4" x 5"	Maple
BOOK HOLDER			
R BACK PANEL	1	1/2" x 9 1/4" x 14 1/2"	Maple
S PANEL SUPPORT	1	1/2" x 4 3/8" x 13"	Maple
T BOOK REST	1	1/2" x 2" x 14 1/2"	Maple
U BOOK COVER	1	1/8" x 8 1/2" x 14 1/2"	Plexiglas

HARDWARE:

- (18) #6 x 1" Fh Woodscrews
 - (6) #6 x 3/4" Drywall Screws
 - (6) 3/4" Brads
 - (3) 12" lengths of 1 1/16"-wide Piano Hinge
 - (2) Low-Profile Shelf Supports (#22286) *
- * Item available at Rockler.com; 800-279-4441.

Building the Rail Assembly

The rail assembly is what makes the unique "pull out, drop down" feature of these storage trays possible. It's made of five parts: two hardwood rails that enclose the sides of the unit, two aluminum tray supports, and a hardboard mounting plate.

Sizing the Rail Assembly—

When sizing the assembly, the outside faces of the rails should sit flush with the sides of the cabinet. Mine were 18" wide, so the rail assembly matches that width. As for depth, make it $\frac{1}{2}$ " shorter (front to back) than the depth of the cabinet. This will allow for a $\frac{1}{2}$ "-thick false front that's added later.

Making Rails—The rails (A) are pieces of $\frac{1}{2}$ "-thick hardwood that are ripped to width and cut to length on the table saw. To accept the shelf supports, cut a centered groove in the inside face of each rail. A pass on the table saw is all that's needed to accomplish this.

Of course, the tray would just pull out of these open-ended grooves. Because of

this, I glued in a hardwood filler strip (B) to create a "stopped" groove.

The next step is to cut a rabbet in the top and bottom edge of each rail. The rabbets in the top edges accept the mounting plate. The bottom rabbets receive the aluminum tray supports.

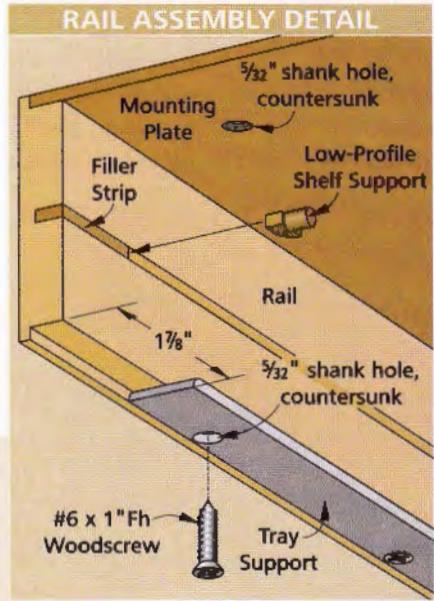
Mounting Plate—The mounting plate (C) is a piece of hardboard that connects the rails. It will also be used to attach the storage tray to the cabinet. For easy assembly later, drill mounting holes now (*Rail Assembly Detail*). While you're at it, drill holes for attaching the mounting plate to the rails.

Tray Supports—Next add the two tray supports (D). These aluminum pieces form a lip to hold the tray.

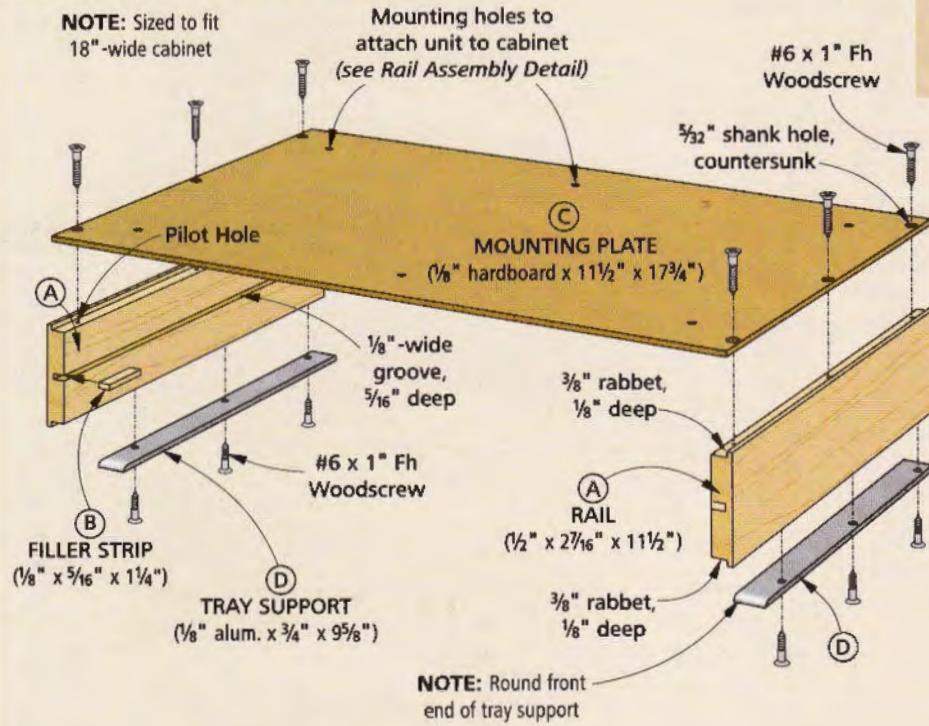
Cut the tray supports to length with a hacksaw, and then drill countersunk shank holes, which will be used to attach the supports to the rails. Use a sanding block to round the front end of each support to prevent the sharp edges from digging into the tray.

Putting It Together—Now it's time to put the rail assembly together. First, clamp the mounting plate between the rails. Using the countersunk holes as guides, drill pilot holes in the rails, and attach the mounting plate with screws.

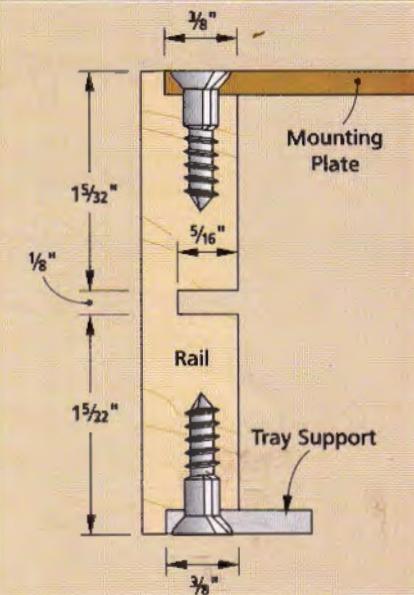
Before you attach the tray supports, be aware that the supports must be set back from the front end of each rail (*Rail Assembly Detail*). Mounting the supports this way allows the trays to tilt down at the proper angle.



RAIL ASSEMBLY



RAIL END VIEW



Assembling the Storage Trays

The next step is to build the trays that fit inside the rail assembly.

Tray Size—The trays are $\frac{1}{16}$ " narrower than the distance between the rails. This leaves clearance for the trays to slide smoothly in and out.

Make the Tray—Each tray is a box made of $\frac{1}{2}$ "-thick hardwood that's assembled with rabbet joints and screws. After planing the stock to thickness, rip and crosscut the tray sides (E), front (F), and back (G) to size on the table saw (*Tray Assembly*).

The front and back fit into rabbets cut in both ends of each side (*Rabbit Details*). It may seem like these rabbets are deeper than usual ($\frac{3}{8}$ "-deep in $\frac{1}{2}$ "-thick stock), but the extra depth lets you

install screws to hold the tray together. In addition to the rabbets, you'll need to cut a series of $\frac{1}{8}$ " dadoes in the inside faces of all four tray pieces. These dadoes will hold the dividers that organize the trays. Each dado only requires a single pass over the table saw blade.

Once that's done, the top rear corner of each tray side needs some attention. Start by laying out and drilling a hole for a shelf support in each piece (*Side Detail*). The next step is to cut a 45° miter in that same corner. This miter allows the trays to tilt down and rest at the proper angle. To end with identical pieces, it's a good idea to join them together with double-sided tape. Then miter the corners using a table saw or a miter saw. To finish up, sand a radius to soften the sharp corners.

Tray Assembly—The tray is held together with glue and screws. As always, dry-assemble the pieces to

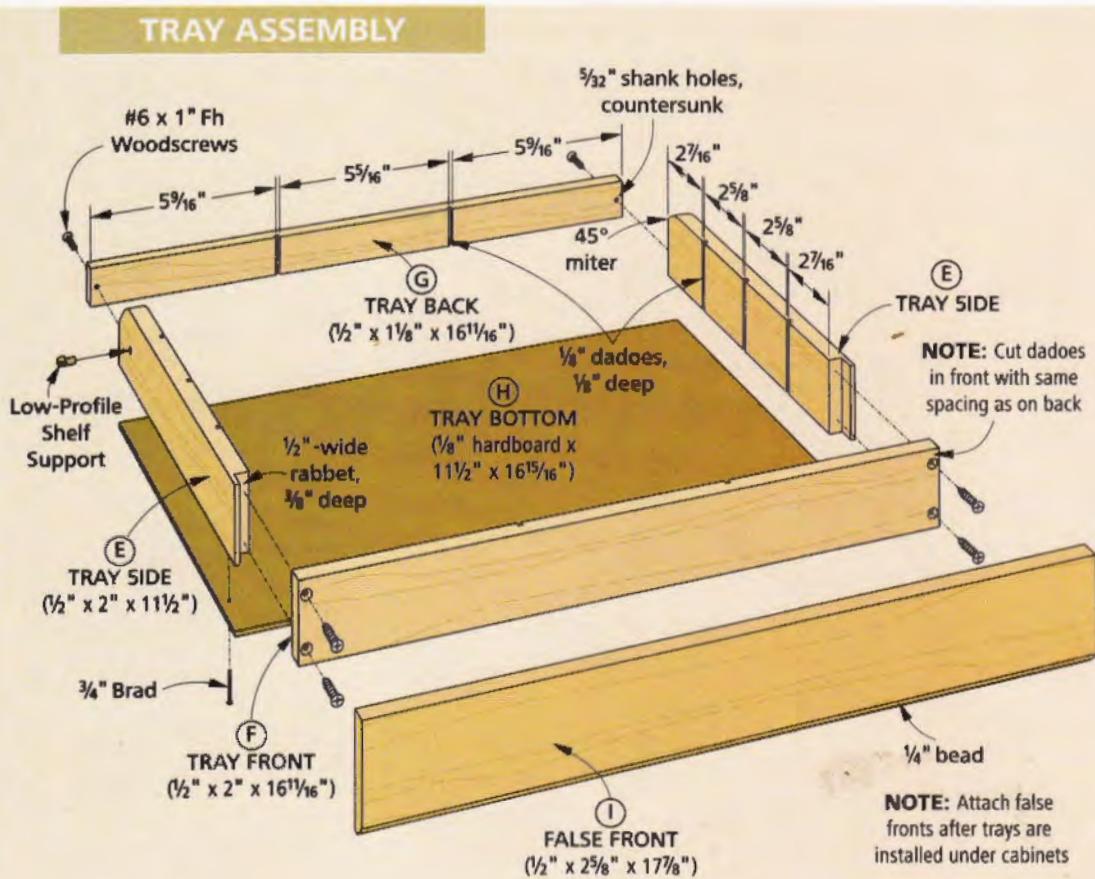
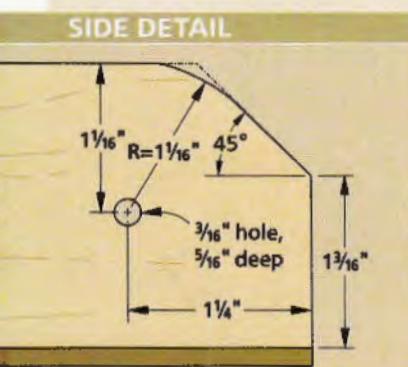
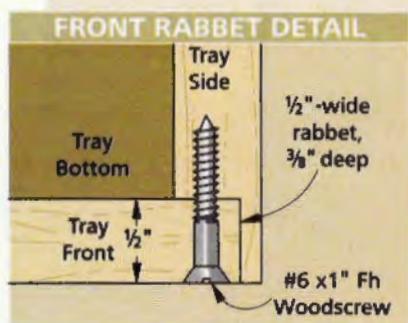
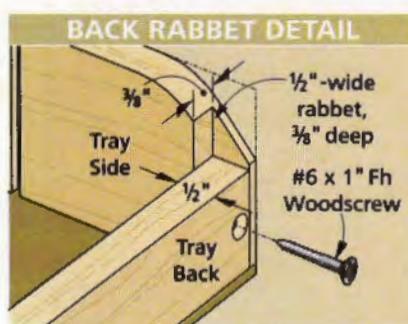
check the fit, and make sure the tray is square when you glue it together.

The last step is adding a $\frac{1}{8}$ " hardboard bottom (H) to the tray. Simply cut the bottom to fit, and then glue and nail it in place with small brads.

False Fronts—Before installing the trays, there's one last thing to do. That's to make a false front (I) for each tray. The false front is wider than the front of the tray. This way, it forms a lip underneath for pulling the tray out.

As a decorative touch, you might want to rout a profile along the bottom edge to match your cabinets. (I used a $\frac{1}{4}$ " beading bit.) Then trim the false fronts to length.

Matching the Finish—One final note: You'll want to finish the false fronts and exposed tray sides to match the existing cabinets. I took a cabinet door to a local paint store and had them mix a finish to match.



Tray Installation

Given the "drop-down" design of the trays, there are two things to keep in mind as you get ready to mount them underneath the cabinets.

First, you need to clip a "wing" off each shelf support (*Photo, right*) to allow the trays to tilt all the way down.

Second, the storage tray and rail assembly must be installed as a single unit. If you were to attach the rail assembly first, you wouldn't be able to insert the tray from the front. (The filler strips in the grooves in the rails

would prevent it.) So slide the tray into the opening in the back of the rail assembly first (*Fig. 1*). Then you can attach the entire unit to the underside of the cabinet (*Fig. 2*), and finish up by adding the false front (*Figs. 3 and 4*).



1] To install the trays, clip one "wing" off each shelf support (*left*). Install the supports, and slide the tray into the rails.



2] Next, align the unit under the cabinet, and clamp it in position. Now pull out the tray, and screw the unit in place.



3] Temporarily "clamp" the false front in position on the front of the tray with a strip of double-sided tape.

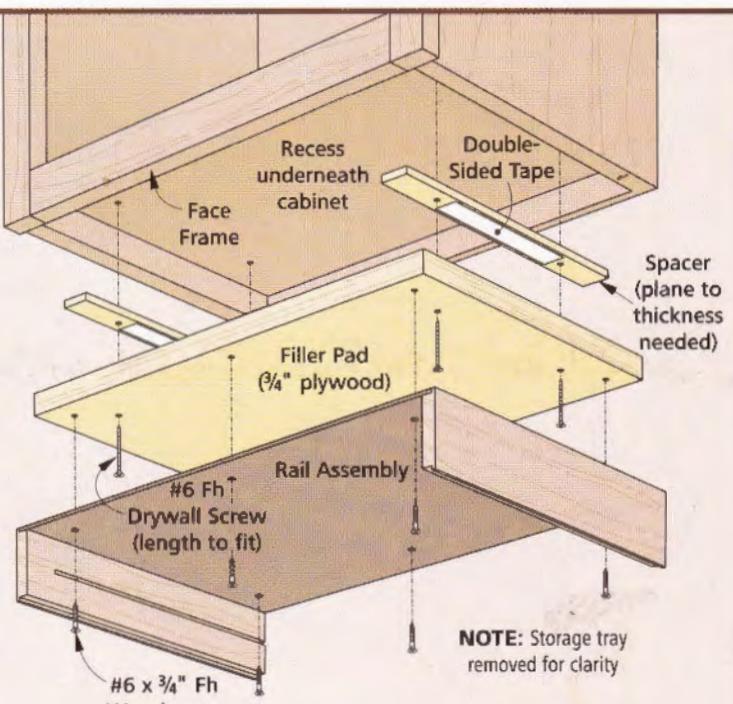
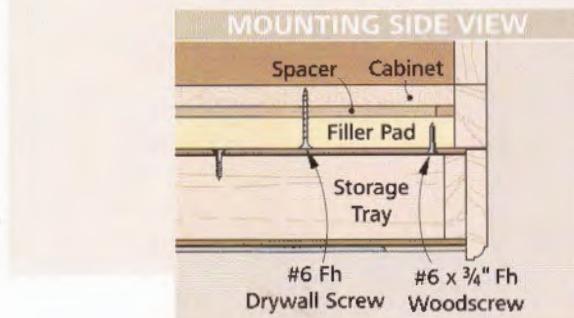


4] Pull out the tray, and attach the false front by running screws through the tray front and into the false front.

RECESSED-BOTTOM CABINETS

Our kitchen cabinets had a flat bottom for mounting the trays. A cabinet with a face frame, however, will have anywhere from a $\frac{1}{2}$ " to 1" recess underneath (*Illustration, right*). You'll need to fill this recess before mounting the tray. To do this, screw a plywood filler pad into the base of the cabinet. **Note:** You may need to add spacers to make it fit flush with the bottom of the face frame.

Once the filler and spacers are attached, mount the tray to the cabinet the same way as before—by driving screws up through the mounting plate and into the filler pad (*Mounting Side View*).





Spice Rack

Add a few extra parts, and you can convert the tray into a handy spice rack. This keeps all your favorite spices close at hand and off the countertop. The separate dividers also give you extra room to store other small kitchen items that need to be quickly tucked away.

The rack can be divided into anywhere from two to 12 compartments, depending on the size and

number of spice containers you want to store. But the first step is to work on the tray divider.

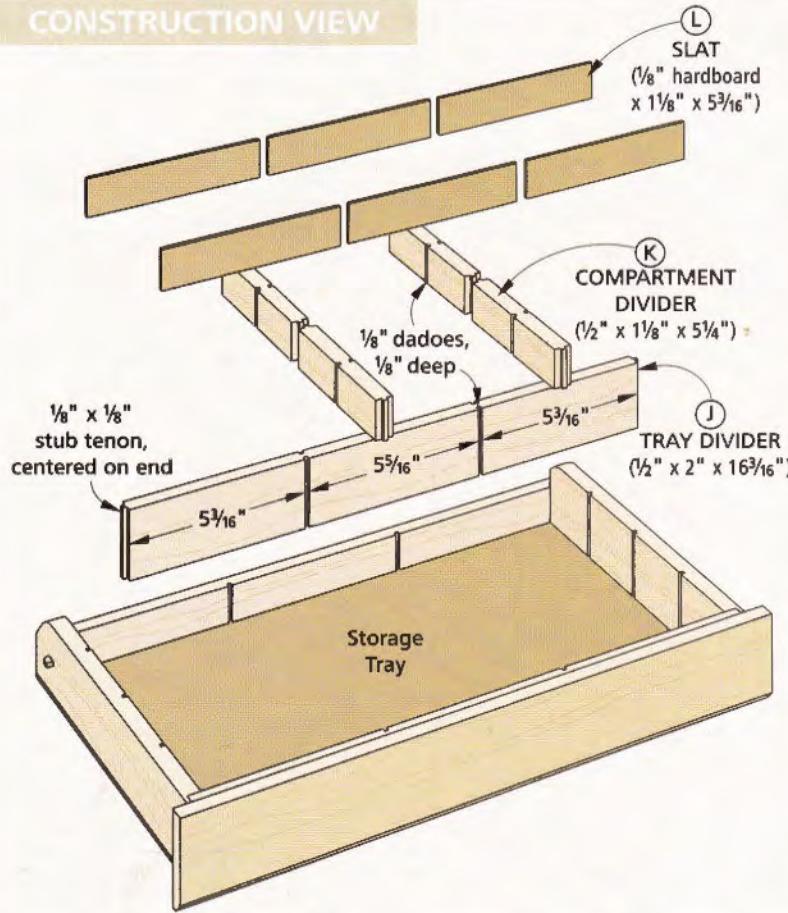
Tray Divider—The key component of the spice rack is a tray divider (J) that separates the tray into two main compartments (*Construction View*). This divider has stub tenons cut on the ends to fit the dadoes that were cut in the tray sides earlier (*Stub Tenon Detail*). It also has two dadoes cut in each face to

accept a pair of smaller dividers that further compartmentalize the tray.

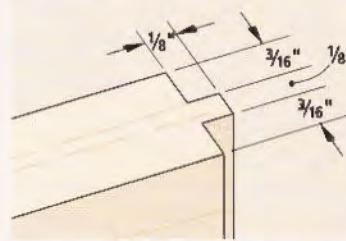
Compartment Dividers—These smaller dividers (K) are hardwood blocks that separate the tray into six equal-size compartments. Here again, they have stub tenons cut on the ends to fit the dadoes in the large divider and those in the tray front and back.

Hardboard Slats—Notice that these compartment dividers also have centered dadoes cut in both faces (*Divider Detail*). These dadoes accept optional hardboard slats (L) that further divide the compartments. If you want to use your spice rack to hold taller 4" spice containers, leave the slats out. To store the shorter 2" spice containers, add the slats, and then each section will accommodate two rows of spice containers.

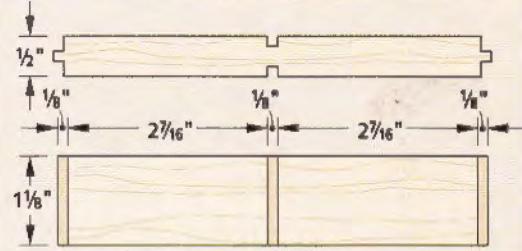
CONSTRUCTION VIEW



STUB TENON DETAIL



COMPARTMENT DIVIDER DETAIL



Knife Rack

Another option is to convert a tray into a knife rack. This rack has two compartments: One for smaller steak knives and a second compartment for larger kitchen knives.

Tray Divider—The construction of this knife rack is similar to that of the spice rack. A tray divider (M) separates the tray into two compartments. Here again, this divider has stub tenons cut on the ends to fit the dadoes in the tray sides. And as before, two dadoes are cut in each face of the divider. Only this time, these dadoes accept knife holders.

Add Knife Holders—The knife holders (N, O) are $\frac{1}{2}$ "-thick blocks with slots cut in the top edges.

Notice the size and location of the slots on the knife holders varies

depending on the knives they will hold (*Knife Rack Parts*).

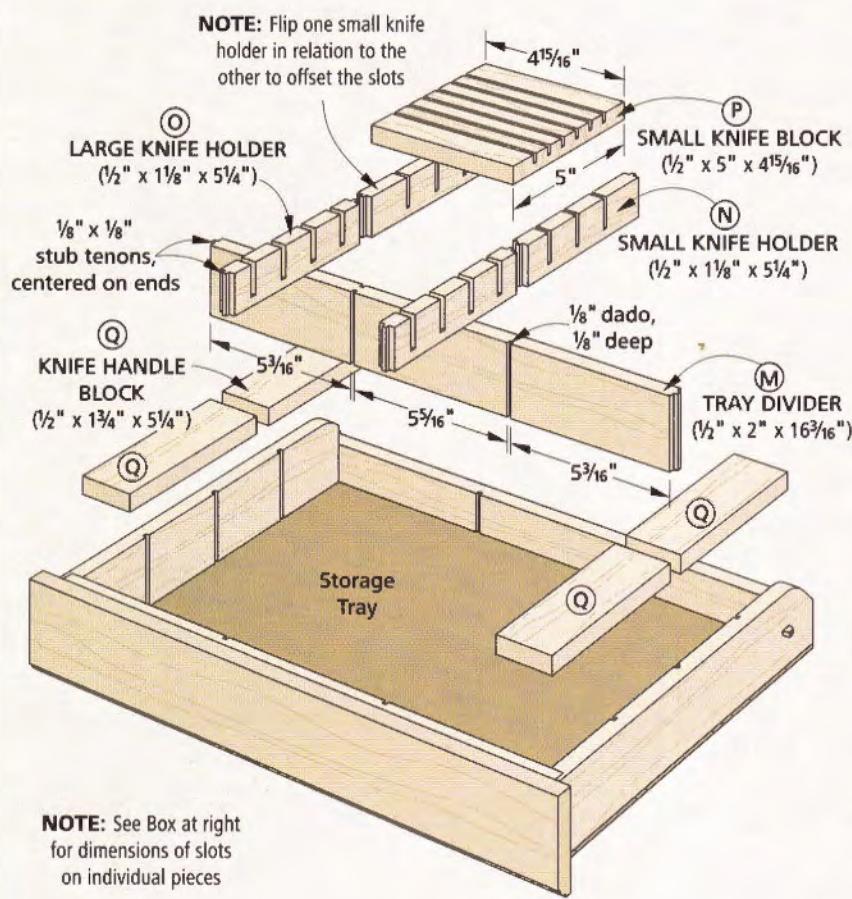
Small Knife Block—In addition to the two small knife holders, a small knife block (P) nestled between them lends extra support to steak knives. The knife block has six grooves cut in its face to hold the blades.

Knife Handle Blocks—The last parts of the rack are four knife blocks (Q) that support the knife handles.

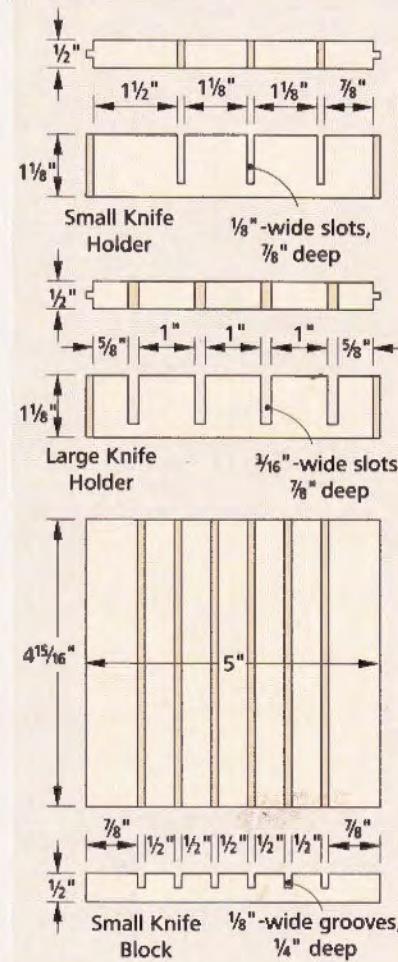
Put It Together—Once all of the pieces are cut, just slip them into the tray (no glue needed). To make the most efficient use of the space, the handles and blades of the steak knives alternate. To accomplish this, simply flip one of the small knife holders in relation to the other one, so the slots in each one are offset.



CONSTRUCTION VIEW



KNIFE RACK PARTS



Cookbook Holder

Another nifty way to accessorize one of these storage trays is to add a fold-out cookbook holder. With the tray open, you can tilt the book holder up to hold a cookbook, magazine, or a single loose-leaf recipe.

A Plexiglas cover prevents grease from splattering on your cookbook, and it also holds the book open to the correct page. In addition, when you need to store the holder underneath the cabinet, this cover nestles between the book rest and the back panel, and fits snugly in the tray.

Back Panel—The cookbook rests against a back panel (R). It's a solid-wood panel that's made by edge-gluing pieces of $\frac{1}{2}$ "-thick hardwood. In order to make it easier to lift the cookbook holder out of the tray, drill a 1"-dia. finger hole near the top edge of the back panel. Then all you have to do is round the top corners of the panel.

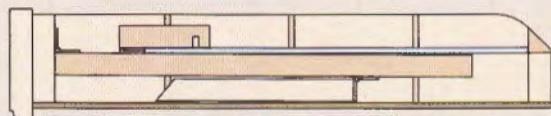
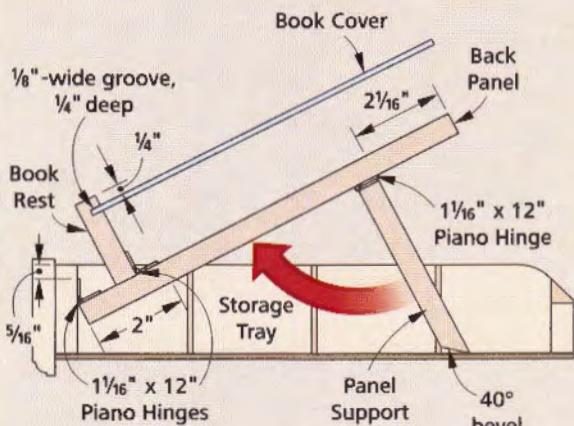
Support for the Panel—The panel support (S) props the back panel at an angle that makes your cookbook easier to read. The only step that's needed to accomplish this is to rip a 40° bevel on the bottom edge of the panel support.

Book Rest—The next piece of this accessory is the book rest (T). It's a piece of $\frac{1}{2}$ " hardwood with a groove cut in it to hold a Plexiglas book cover (U). Here again, round the corners of the book rest. This will create a nice, smooth look.

Assembly—After the back panel, panel support, and book rest have been made, you should be ready to assemble the book holder and attach it to the tray. This is done with three 12"-long piano hinges, which connect the pieces to one another (see *Folding Detail*, below). Now all you need are your favorite recipes.

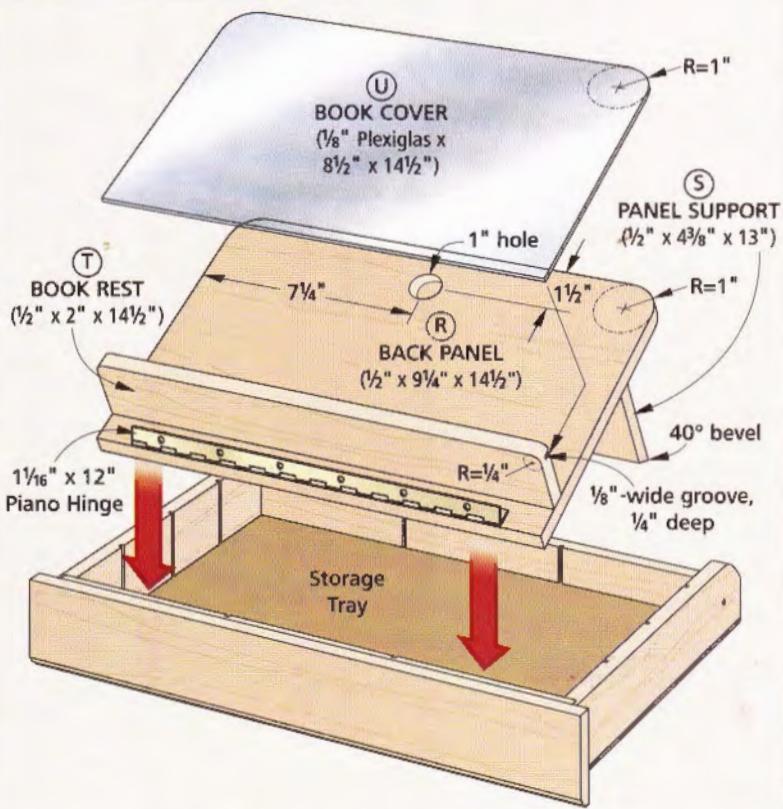


FOLDING DETAIL



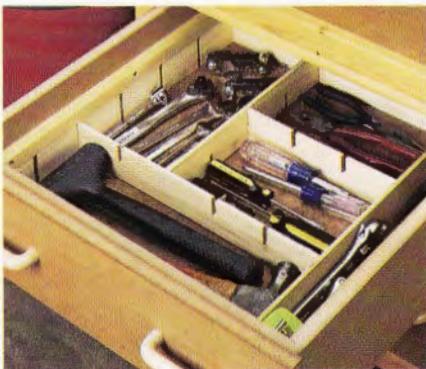
NOTE: To store the book holder, place Plexiglas cover between book rest and back panel, then fold down the holder

CONSTRUCTION VIEW





Wherever you have cluttered drawers, in the kitchen or in the shop, this divider can keep those hard-to-tame items under control. And best of all, the divider parts are inexpensive and easy to put together in a matter of hours.



Whether in a kitchen for utensils or in a shop for hardware, this drawer divider can help keep things tidy and orderly.

For years now, I've been using one of those cheap plastic trays to "organize" the utensil drawer in my kitchen. The problem is, these dividers never really fit the drawer quite right. They always leave a lot of space beside and behind them. And if you try to store anything in those spaces, it winds up wedged underneath the tray, making it completely inaccessible. I just knew that I could build something better.

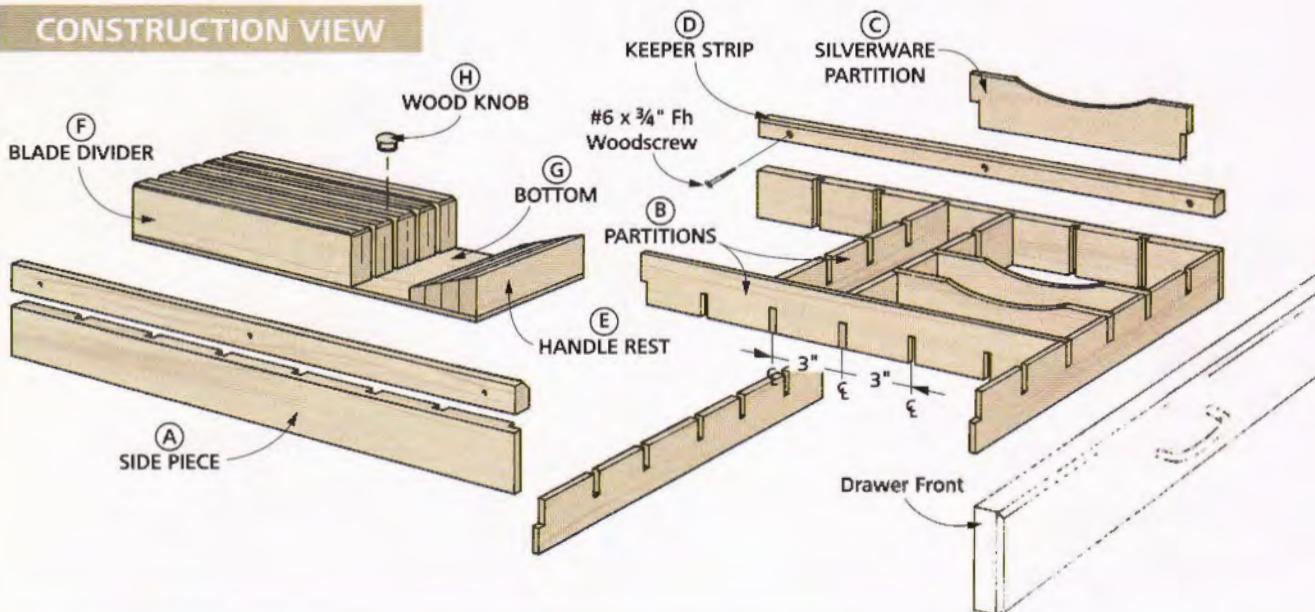
The challenge for this project was coming up with an easy-to-build system that could be customized to fit just about any drawer. This divider does exactly that, and best of all, it

can be built almost entirely using thin "hobby" wood that's readily available.

You can pick up this pre-sanded wood at most home centers. The widths and thicknesses you need for this project are pretty common. Now, of course, if you wanted to, you could cut and plane the pieces out of stock that's already on hand. But that's an awful lot of time to spend on a small project, especially when the hobby wood is so affordable and easy to find.

Besides the hobby wood, you'll need a few pieces of $\frac{3}{4}$ "-thick stock to make the keeper strips. You can probably find what you need in your scrap bin. And now you're ready to get started.

CONSTRUCTION VIEW



MATERIAL LIST

Part	Qty	Size	Material
DIVIDER			
A	SIDE PIECES	2	1/2" x 2" x cut to fit*
B	PARTITIONS	**	1/4" x 2" x cut to fit*
C	SILV. PARTITIONS	3	1/4" x 2" x 9 1/4"
D	KEEPER STRIPS	2	3/4" x 9/16" x cut to fit*

* Drawer size dictates length. ** Number of parts will vary based on your needs.

Part	Qty	Size	Material
KNIFE BLOCK			
E	HANDLE REST	1	1 7/16" x 3" x 5 3/4"
F	BLADE DIVIDERS	5	1" x 3" x 11 1/8"
G	BOTTOM	1	1/4" x 5 3/4" x 17 5/8"
H	KNOB	1	3/4"-dia.
I	DOWEL	1	3/16"-dia. x 1 1/4" long

DIVIDER DESIGN

To get a feel for how this divider will work, take a look at the *Photo* on page 13 and the *Construction View* above.

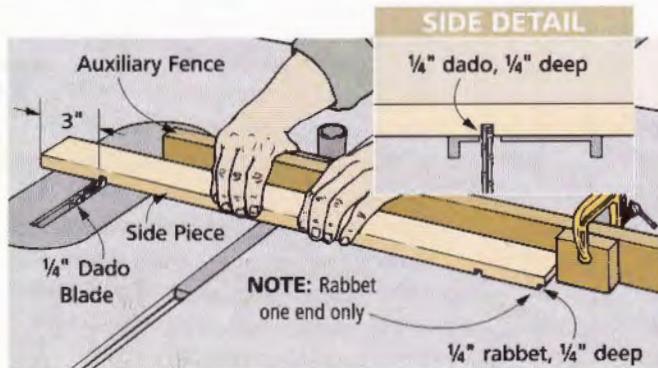
The divider has two side pieces (A) that are $\frac{1}{2}$ "-thick. There's a rabbet in one end of each of the side pieces to hold a partition (B), placed at the very front of the drawer. Both side pieces also have dadoes spaced 3" on-center along their length. The dadoes are cut to match the thickness of the partitions, which are $\frac{1}{4}$ " thick.

The partitions (B, C) have notches cut in them at regular intervals, too. These notches allow you to lock the partitions together into a grid. The silverware partitions have an arc cut into them, which makes it easier to get your hand into the narrow compartments.

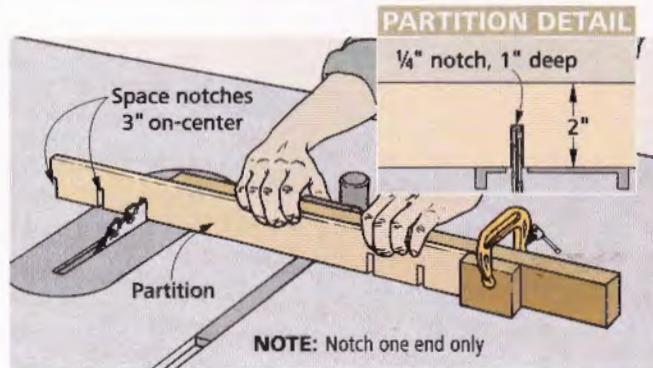
The divider isn't glued together. Instead, the entire assembly is held together in the drawer with just six woodscrews. Because it's a dry assembly, you can rearrange the divider anytime that you need to.

Building the Divider—You can begin by making test pieces to set up for the side pieces. Work with wood that is a little longer than the drawer (you'll custom-fit it later). Then, after the pieces are all cut to size, set up to cut the row of dadoes in each piece. First, make test cuts in scrap wood, and adjust the thickness of the blade until the partitions slide easily in the dadoes.

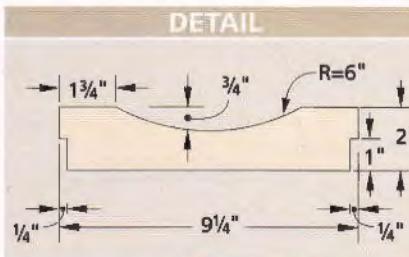
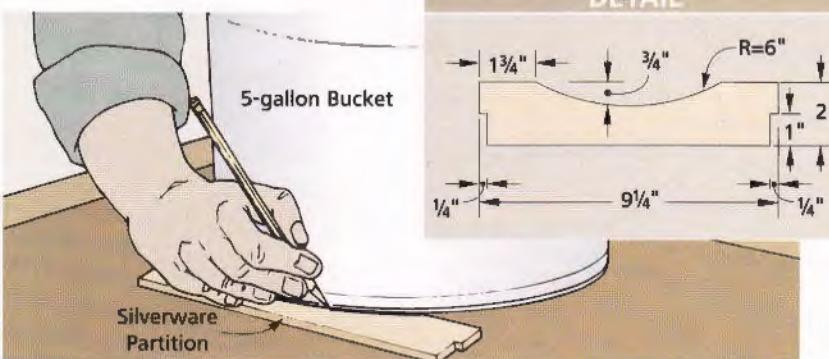
Now you can get going on the actual side pieces (Fig. 1). Begin by cutting the rabbets. Then, set the table



1] After cutting a rabbet on one end, use a stop block to position the board to cut the dadoes. For consistent spacing you can actually make two cuts at each stop-block position.



2] To cut the notches, set the blade to half the height of the partition. Again, you can use each stop-block position for two notches by flipping the workpiece end for end after each cut.



3] The arc's radius doesn't have to be exact on the silverware partitions. Anything with about a 6"-radius will work as a template.

saw up to make the first dado, and use a stop block to establish that position. That way, you can simply put the second side piece in place and make an identical cut. Now reposition the stop block to cut the remaining dadoes.

You can use the same stop block technique to cut the notches in the partitions (B) (Fig. 2). You'll have to raise the table saw blade to cut halfway through the partition. Notch a couple of pieces, and then test-fit them together. The top edges of the partitions should be flush with each other.

Partitions for Silverware—The silverware partitions (C) are made from $\frac{1}{4}$ "-thick stock, just like the other partitions. But you'll have to cut them to length before notching the ends.

After you've finished cutting these parts, lay out a 6" arc on one of the silverware partitions. You can do this by tracing the bottom of a five-gallon bucket or a wastebasket (Fig. 3). Another option is to make a cardboard pattern for the arc. Just use a compass to draw a 12"-diameter circle on the cardboard.

After that, you can cut it out and trace it onto the partition blank.

To cut the arc out of the partition, use a jigsaw or a band saw. Then sand it to its final shape. Now use this partition as a pattern to lay out the rest of the silverware partitions.

Keeper Strips—The last pieces you need to make are the keeper strips (D). They're pretty simple, and they require only a few steps.

Start with a piece of $\frac{3}{4}$ "-thick stock that is slightly longer than your drawer. This blank should also be wide enough that you can safely rip at least two strips that are $\frac{1}{16}$ "-wide from it.

But first, you'll want to chamfer both edges of the blank (Fig. 4). I cut the chamfer with a router and a chamfer bit, but you could do it easily on the table saw, as well. Once that's done, rip the chamfered edges off the blank to make the strips (Fig. 5).

Installing the Divider—Putting this divider together is very straightforward. The best place to start is with the side pieces. At this point, simply cut



Interlocking notches allow you to cut and fit the partitions in any configuration to suit your needs.

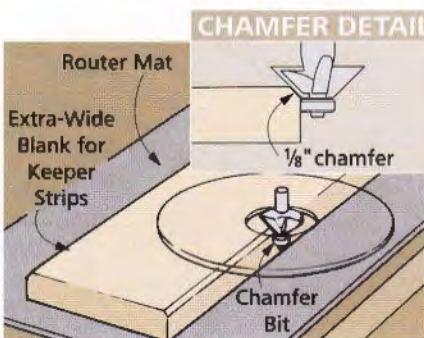
the side pieces to length, and fit them into the drawer.

Next, cut some partitions to fit the length and width of the drawer. The size of the drawer may mean cutting the partitions in between notches. If that is the case, cut new notches at the ends of the partitions, so they will lock into the grid.

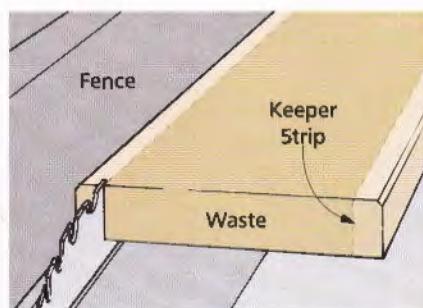
The configuration of the partitions will depend on what you want to store in the drawer. So be sure to figure out how you want it all to go together before cutting the pieces to final length.

Finally, you can cut the keeper strips to length and set them in place. Fasten them to the sides of the drawer with #6 x $\frac{3}{4}$ " woodscrews (Fig. 6).

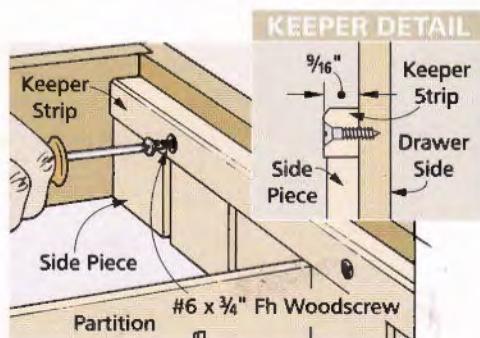
As it is, this drawer divider will work great for keeping your drawer organized. But you can make it even more useful by adding a knife block to store your kitchen knives. Plans for the knife block begin on the next page.



4] In order to make the keeper strips, first chamfer both edges on a piece of stock with a router.



5] Then, set your fence $\frac{1}{16}$ " away from the blade, and rip a keeper strip from both edges of the wide blank.



6] Pre-drill and countersink holes before screwing the keeper strips to the drawer sides.

Knife Block

The blade dividers on this knife block space the knives so they're easy to grasp. A sloping handle rest (E) accommodates a variety of knife lengths and keeps the knives from sliding back and forth when the drawer is opened and closed. Since the block isn't fastened to the drawer or the divider, it can easily be removed for cleaning. A simple wood knob makes the block easy to lift out.

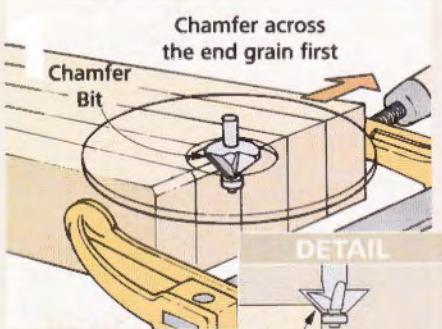
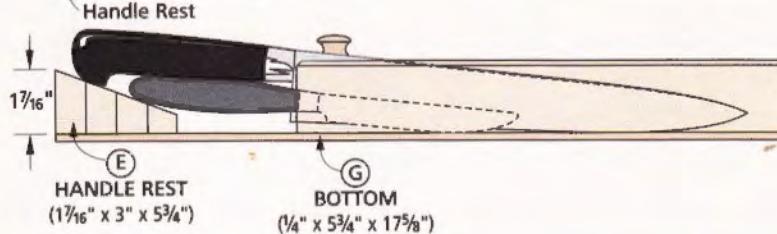
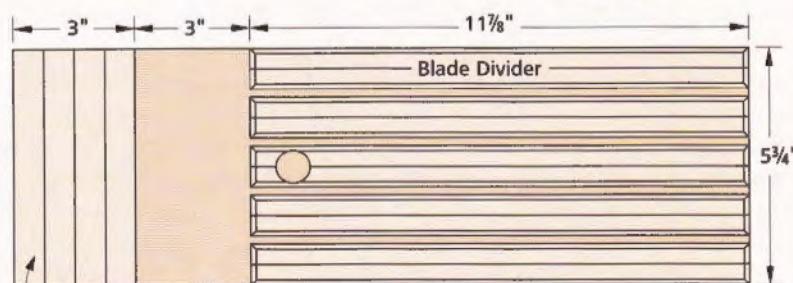
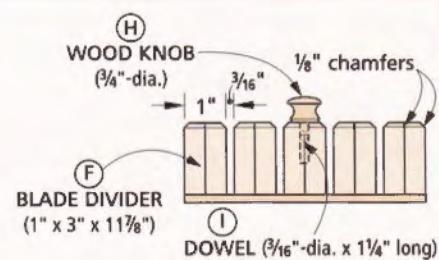
Begin making the knife block by ripping and gluing together two $\frac{1}{2}$ "-thick pieces of wood for each blade divider (F) (*Knife Block Elevation*). Leave these pieces a little long until the glue has set, and then cut them to length. Then chamfer the ends and edges to give the block a finished look and make it easier to insert the blades (Fig. 1).

Now, simply glue up a blank for the handle rest. Be sure to make the blank a little larger than necessary, so you can cut matching angles in two passes instead of trying to make one perfect cut (Fig. 2). Then glue and clamp the angled pieces together (Fig. 3).

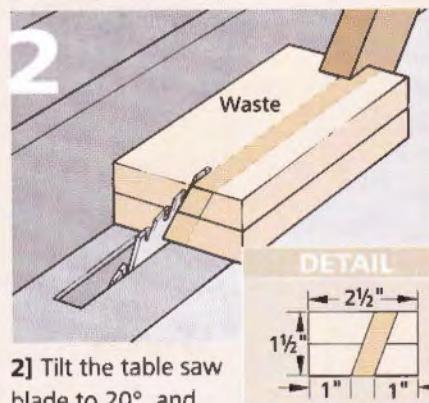
Next, cut a plywood bottom (G) to size, and glue and clamp the handle rest in place. At this point, you can also add the blade dividers. To do this, just spread glue on each divider, and space them evenly across the plywood bottom. Finally, fasten the knob (H) onto the divider with a dowel (I) and glue to complete this "sharp" storage solution. ■■■



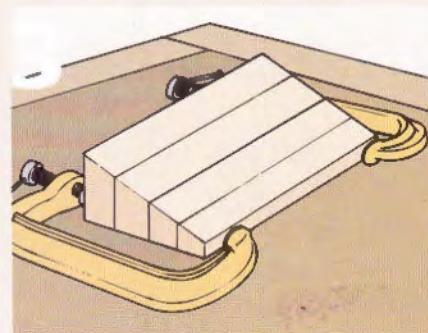
**KNIFE BLOCK
ELEVATION**



1] Clamp the blade dividers together, chamfer the ends, and then separate the pieces to rout the edges.



2] Tilt the table saw blade to 20°, and cut the handle rest in two passes to make matching pieces.

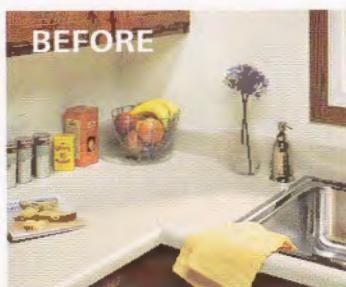


3] Glue and clamp the handle rest together. There may be a small ridge where the pieces meet. Sanding or planing will remove the ridge.



kitchen display rail

A flavorless kitchen doesn't really require a whole new recipe. Spice up the kitchen you have with this tasteful plate rail and backsplash. It's the perfect garnish to an existing post-formed countertop.



Although it's functional, this outdated post-formed countertop made for a bland kitchen.

If you've lost your taste for your dull "post-formed" kitchen countertop, you're not alone. This type of countertop, which features a built-in backsplash and drip edge, has been standard issue in new and remodeled kitchens for years, and for good reason. They're inexpensive, they have an all-in-one design that makes them easy to install, and the plastic laminate surface is almost indestructible. The drawback is that they are typically quite bland.

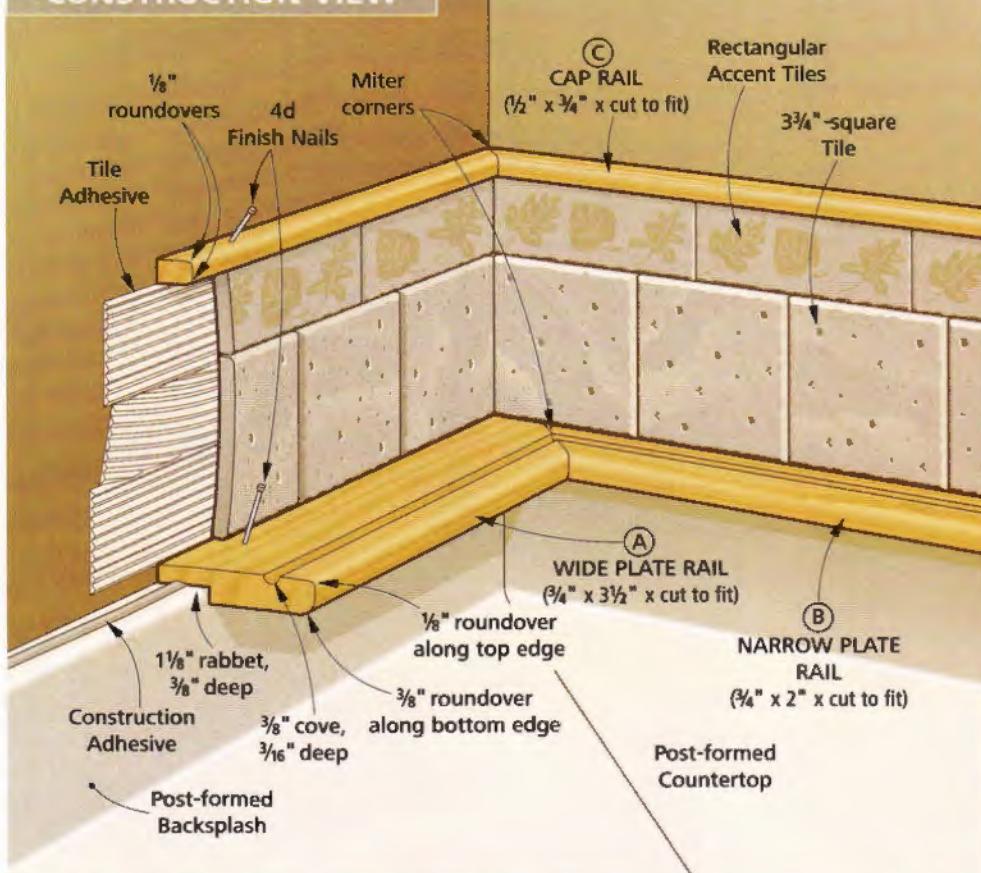
But replacing a post-formed countertop isn't the only way to breathe new

life into your kitchen. Just compare the *Before* and *After* photos of this kitchen, and you'll see how we resuscitated it with a new coat of paint, a wood plate rail, and a tile backsplash.

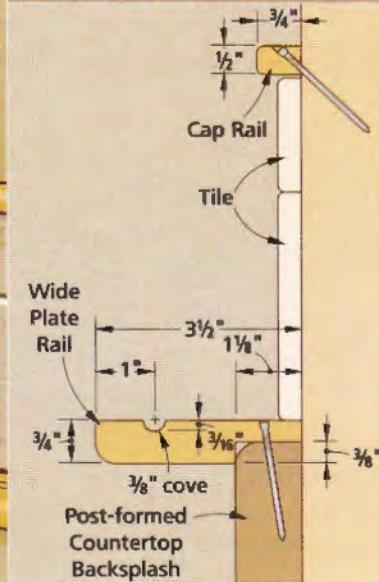
The combination plate rail/backsplash can easily fit in your kitchen. Simply use the same wood for the plate rail that your cabinets are made of, and be creative in selecting the backsplash material. I used one row of square, "tumbled" tiles with an accent row of rectangular tiles imprinted with leaf silhouettes.

Don't let the dramatic impact of the project fool you. You should be able to complete this kitchen counter update in a weekend and only have to order out for a meal or two.

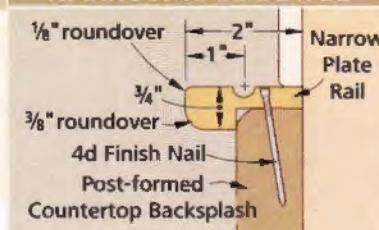
CONSTRUCTION VIEW



FULL SECTION DETAIL



NARROW RAIL DETAIL



Installing the Plate Rail

This kitchen counter update uses a few basic ingredients: a plate rail made of $\frac{3}{4}$ "-thick oak, two rows of tile to make the backsplash, and finally a single piece of $\frac{1}{2}$ "-thick oak for the cap rail (*Illustration, above*).

However, if you look closely, you'll see that I made the plate rail in two different widths. I had to do this in my kitchen because I needed a narrower plate rail to fit behind the faucet. Depending on your space, you may be able to get away with making all of your plate rails the same width.

Make Extra-Long Pieces—The first step in making the plate rails (A, B) and the cap rail (C) is to determine the lengths you will need. This depends on the length of your countertops, and if there's a window on the wall that will interrupt the run of the cap rail. So you'll want to get some measurements before heading to the shop.

Once you know the lengths you'll need, you can cut the plate rails and cap rail to size. I highly recommend that you

cut the pieces at least a foot longer than you will really need. This extra length will be handy later when you're trying to fit the tricky miter joints together.

Once your pieces are cut to rough length and ripped to width, you're ready to rout a few details in them.

First, rout a groove in the plate rails for plates to nest in. Use a $\frac{3}{8}$ "-radius cove bit for this, and set your router table fence to cut the groove 1" from the front edge of the plate rails.

Next, you can round over some of the edges. In the case of the cap rail, both of the outside edges get routed with a $\frac{1}{8}$ " roundover bit. Then you can use the same router bit to ease the *top edge only* on the plate rails. Now swap that bit for a $\frac{3}{8}$ " roundover bit, and soften the bottom edge of the rails. This larger radius will help to downplay the appearance of a thick edge on these pieces.

Backsplash Rabbet—The next step in making the plate rails is to cut a rabbet in the bottom of the rails along

the back edge. This rabbet will allow the rails to hide the curved edge of the post-formed backsplash. It's a wide rabbet, so you'll want to cut it on the table saw using multiple passes.

With that finished, you can sand all of the pieces and stain them to match the cabinets. The quickest way to find a matching stain is to take a cabinet door to a local paint store and ask for help matching the color. This can save a lot of time experimenting with different stain recipes. After staining, you'll also want to apply at least three coats of spar varnish to protect the wood from water damage.

Installing the Rail—With all of the pieces made, you're ready to start installing the plate rail. This is the part where you're going to run into a couple of small challenges.

The first obstacle is the miter joint, where the plate rails meet in the corner. Because these rails are different widths, you can't simply miter them and expect a seamless connection.



The end of the wide plate rail will have to be notched, so it will clear the adjoining backsplash.

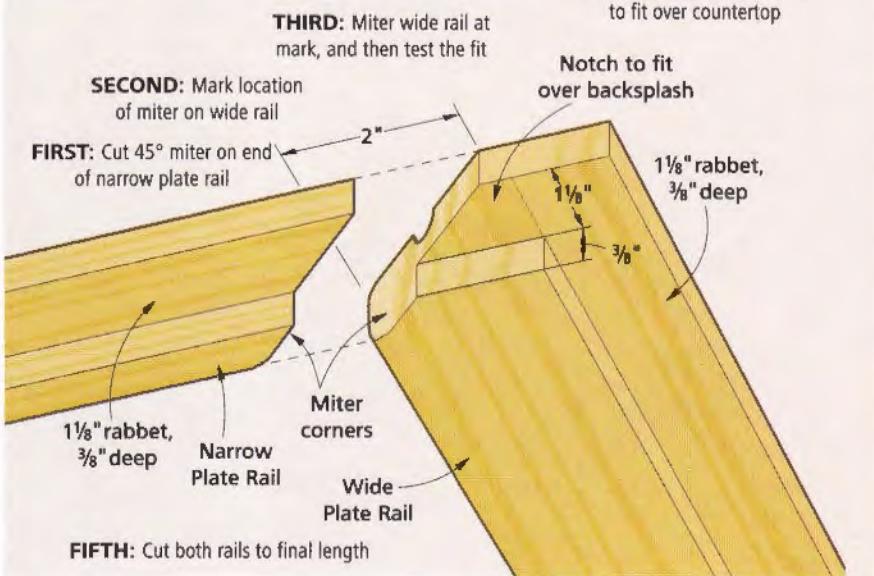
Rather, you'll have to cut a partial miter on the wide plate rail (*Photo, above*). The dimensions shown in the *Illustration* at right should get you close. After you've finished, cut a notch in the underside of the wide plate rail with a hand saw, so the end of this rail fits over the adjoining post-formed backsplash.

At this point, you're ready to attach the rail by laying a bead of construction adhesive on the top of the backsplash. Then position the wide rail on the backsplash, fasten it with finish nails in pre-drilled holes, countersink the nails, and fill the holes with wood filler.

To install the narrow rail, simply miter it to length, and attach it with construction adhesive and finish nails.

Add a Backsplash—The backsplash design that I chose for my kitchen uses two different types of tile. The lower course is square tile, and above that is an accent row of rectangular tile. You can choose a different tile design, or even a different material altogether, to truly make this backsplash your own.

MITERING THE PLATE RAILS



One important detail to consider is to look for a tile that you can install *without* a grout line. By simply butting the tiles together, you avoid messing with spacers between the tiles as you adhere them. More importantly, you can avoid the mess that comes with grouting altogether.

Center Yourself—A complicating factor you can't avoid is the window, provided your kitchen has one. I suggest you begin by installing your tiles underneath the window first.

If you look at *Figs. 1 through 3* below, you'll see how I cut the tile to fit under the window and to wrap around the corner of the window trim. The backsplash looks best if you make sure that these tiles are symmetrical.

A great way to start is in the center of the window, and simply work your

FOURTH: Notch wide rail to fit over countertop

Notch to fit over backsplash

way out. Begin by measuring between the plate rail and window trim to determine how tall to cut your tile. Then cut the tile, and center it underneath the window (*Fig. 1*). Continue to cut and dry-fit tile underneath the window until you reach the corner.

Now you can lay out the corner tiles (*Figs. 2 and 3*). Use the tile saw to cut out the notch, and a pair of nippers to square up the corner of the cut. Continue dry-fitting tile along the plate rail until you come to the corner and/or the end of the countertop, where you may once again have to measure and cut a tile to fit.

If you plan on continuing the backsplash onto the adjoining walls, go ahead and dry-fit and cut these tiles now, as well. That way, all your tile will be ready to go before you apply adhesive.



1] Align the center of the first tile with the center of the window trim. Masking tape makes the lines easier to see.



2] To lay out the corner cut, first mark a tile to match the space between the bottom of the window and the plate rail.



3] Now mark the tile to match the remaining space between the adjacent tile and the edge of the window trim.



Secure the Tile & Cap the Rails

At this point you've installed the plate rail, dry-fit the tile, and cut any tile to size that fits around the window or in the corners. This means you're ready to install these pieces.

For the beginning part of the process, you'll want to make sure you have plenty of tile adhesive, painter's tape, and sealer before you get started. You'll be using the tape first.

Apply Adhesive—Go ahead and remove the dry-fit tiles, and set them aside for now. Then, if you haven't already done so, you should mask the window trim and plate rail with painter's tape to avoid getting any tile adhesive on it. This will save you cleanup time later on.

Before you start spreading the adhesive, lay out a horizontal line on the wall that represents the top of the tile row. This will show you how much area to cover with the adhesive.

When you begin applying the adhesive, place a dollop of it on the wall, and then spread it evenly with a notched trowel. An important note here: You should leave the adhesive below the pencil line by about $\frac{1}{4}$ " (Fig. 1). By doing this, it will prevent adhesive from squeezing out above the tile line and causing problems when it's time to install the cap piece.

After you've finished applying adhesive to one wall, place the bottom row of tiles first. Press each tile firmly into



1] Use a notched trowel ($\frac{1}{4}$ " or $\frac{3}{8}$ " should be fine) to spread an even bed of tile adhesive along the walls.



2] After the tile adhesive has dried, miter the cap pieces, and nail them in place over the top of the tile.

the adhesive, giving it a slight twist to ensure complete coverage on the back of the tile. Then, go ahead and follow the same press-and-twist procedure to add the top course.

Cap Piece—After allowing the adhesive to dry, you can attach the cap piece. This process is just a simple matter of mitering the cap piece to length. For the next step, you can attach it by driving finish nails into the wall studs (Fig. 2).

One thing I need to point out is that I had to nail the cap piece on differently on each wall. Along the wall behind the sink, I toenailed the piece from the top. Along the other wall, though, the way the cabinets were constructed made it difficult to get a hammer in position above the cap rail.

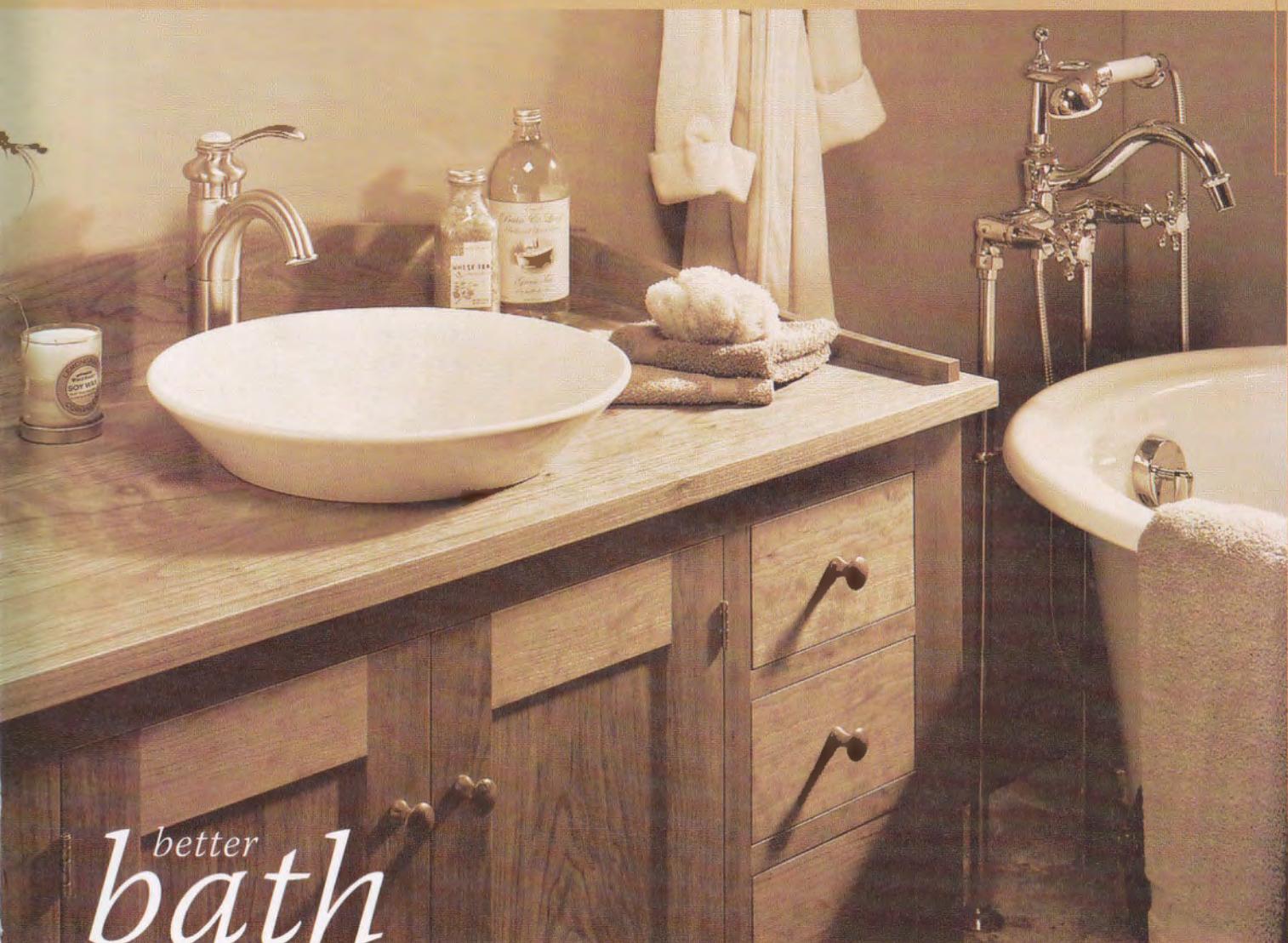
So I had to take an alternate route, and nail this piece through the edge. In both cases, though, I was able to make the nail holes disappear. I did this by simply filling and covering the holes with matching wood putty.

Seal the Tiles—The finishing touch for the backsplash is to protect the tile from stains by applying a sealer. This requires nothing more than brushing on one or two coats (Fig. 3). The number of coats, though, does depend on how porous your tile is, as well as the amount that the manufacturer recommends.

Remember, it's important to allow the sealer to cure completely. Then, once it's dry, you're ready to get creative and display those wine bottles, special dishes, or any other items you can find that make a statement about your kitchen. ■

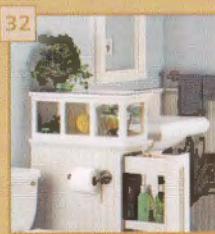


3] Porous tile and the wet conditions in the kitchen mean a couple coats of tile sealer are in order.



better bath storage

More and more these days, bathrooms are becoming stylish rooms rather than just utilitarian spaces in the home. These four projects will satisfy your style demands, while at the same time providing plenty of storage for all your bathroom needs.

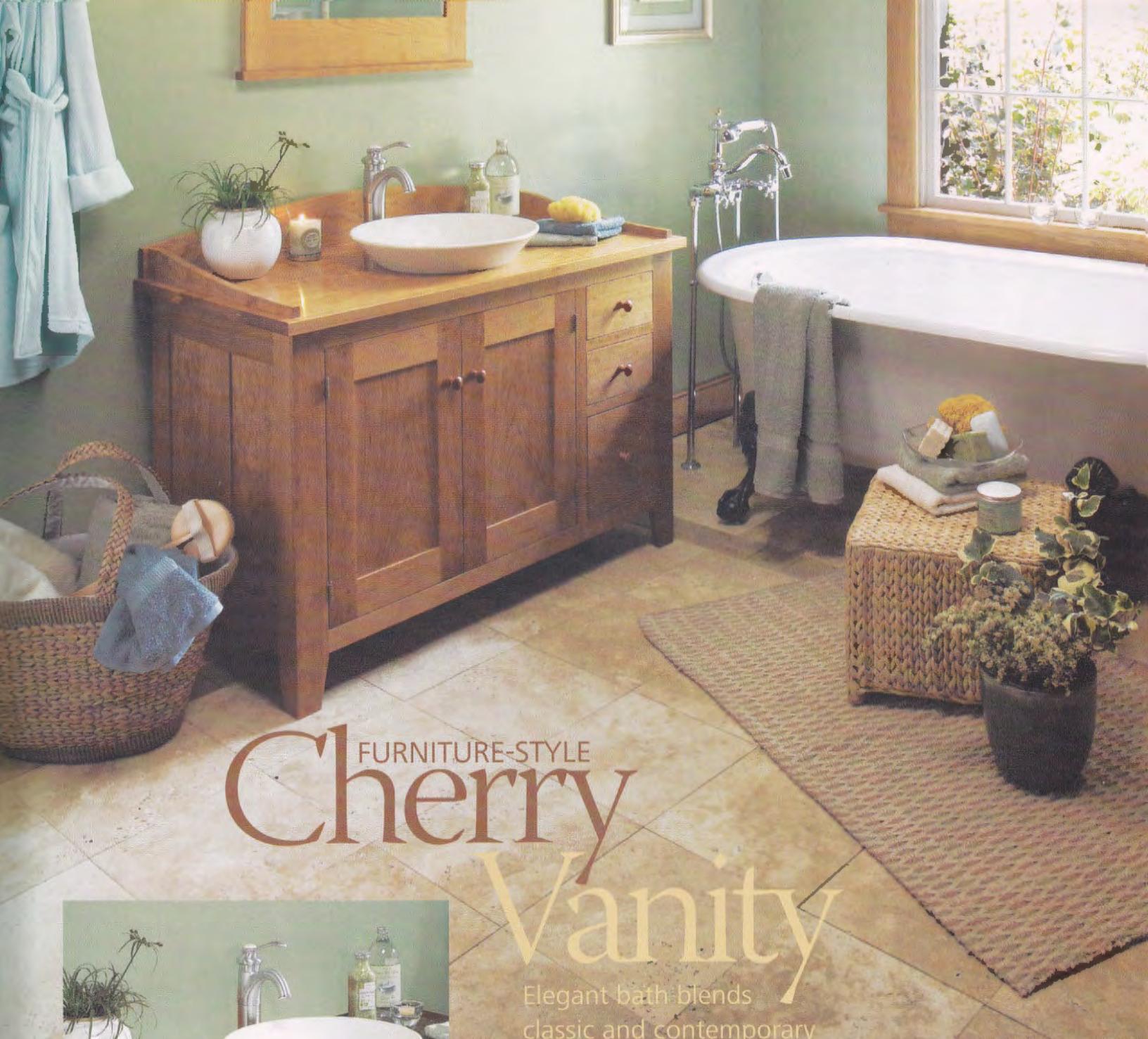


22 Cherry Bathroom Vanity

32 Pantry-Style Privacy Partition

36 Mirrored Medicine Cabinet

38 Built-In Towel Rack



FURNITURE-STYLE *Cherry* Vanity

Elegant bath blends
classic and contemporary

Bathrooms have changed. Once strictly functional spaces now have a more "furnished" and contemporary appearance.

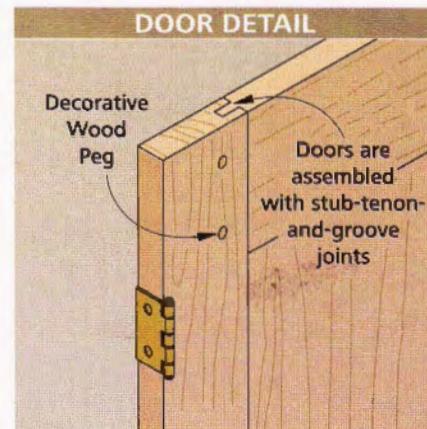
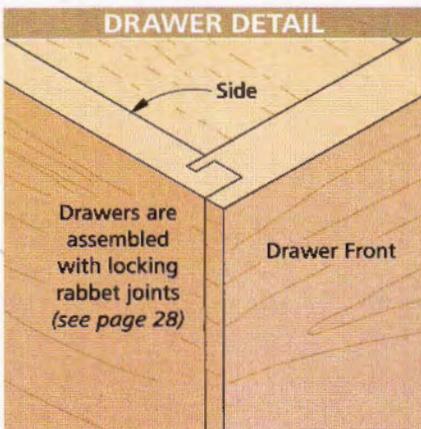
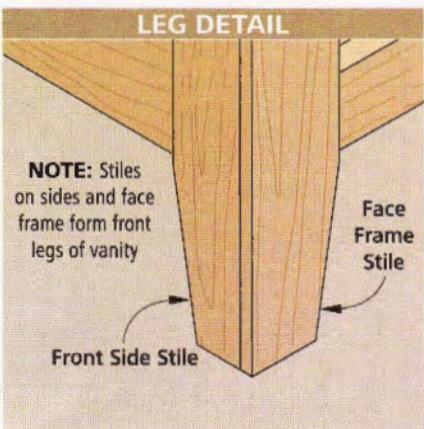
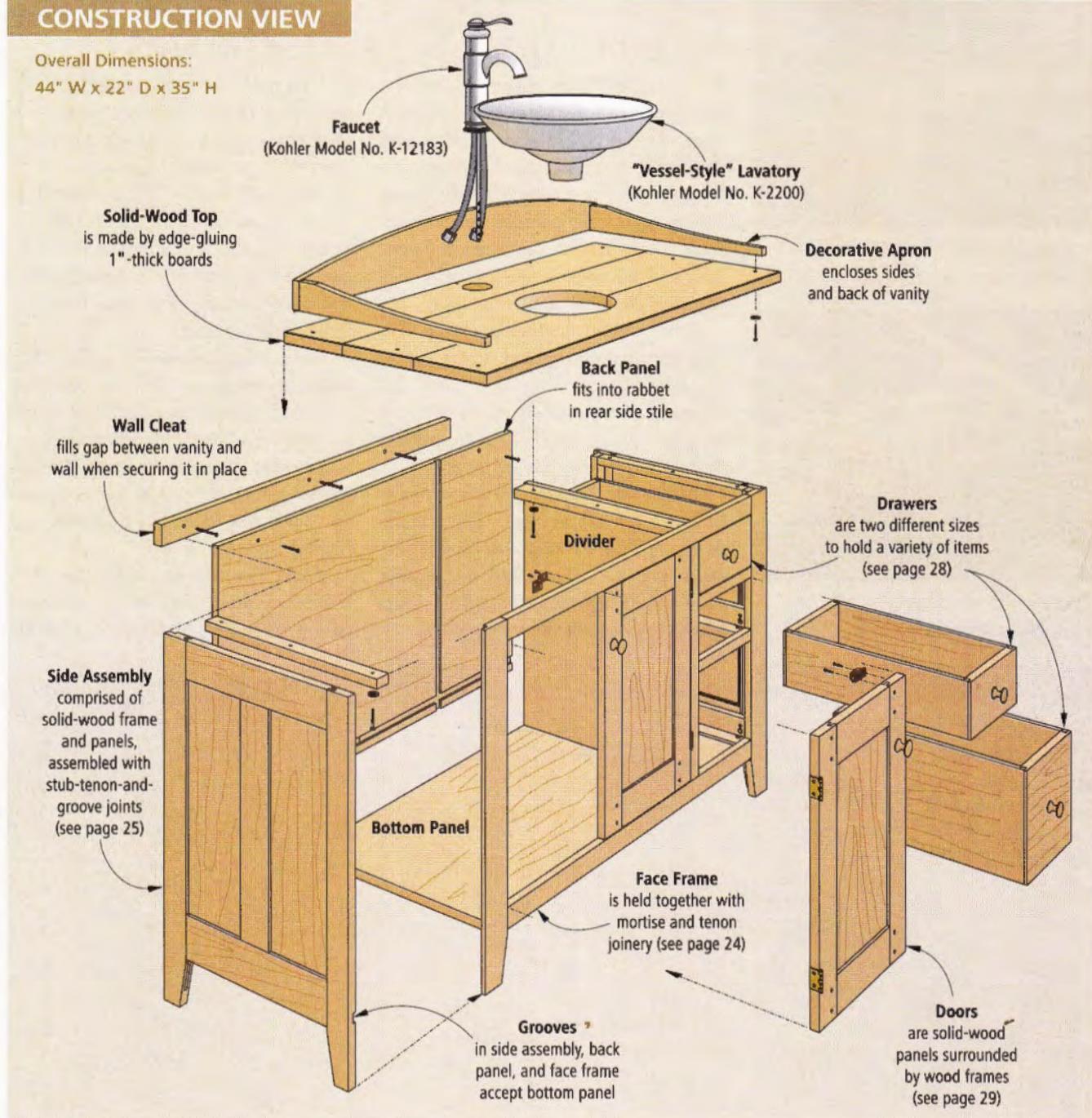
This bathroom is the perfect example. The focal point of the room is a cherry vanity that looks more like a piece of furniture than a typical cabinet. The vanity is inspired by Shaker design, a style that blends well with different types of furniture.

Though it looks traditional, adding a basin-style sink and faucet gives the vanity a contemporary flair. And it looks great with either a classic solid-wood top (above) or a more modern granite slab (left).

CONSTRUCTION VIEW

Overall Dimensions:

44" W x 22" D x 35" H





A mortising machine is a great way to make accurate mortises quickly.



To make the tenons, use a table saw equipped with a dado blade.

Face Frame & Side Assemblies

A hardwood face frame covers the front of this vanity. It consists of three vertical stiles and four horizontal rails that form openings for the doors and drawers (see *Face Frame Assembly* below). For strength, these parts are put together with sturdy mortise and tenon joints. The end stiles also double as front legs to create the look of fine furniture.

Lay Out Mortises—After you have finished cutting the frame pieces (A, B, C, D) to length, lay out the mortises. As you can see, the size of the mortises varies depending on which frame piece is tenoned to fit into it.

Make the Mortises—Now you're ready to cut the mortises. This can be done with a mortising machine (*Photo, upper left*), or you can drill overlapping holes on a drill press, clean out the waste, and square up the ends with a chisel.

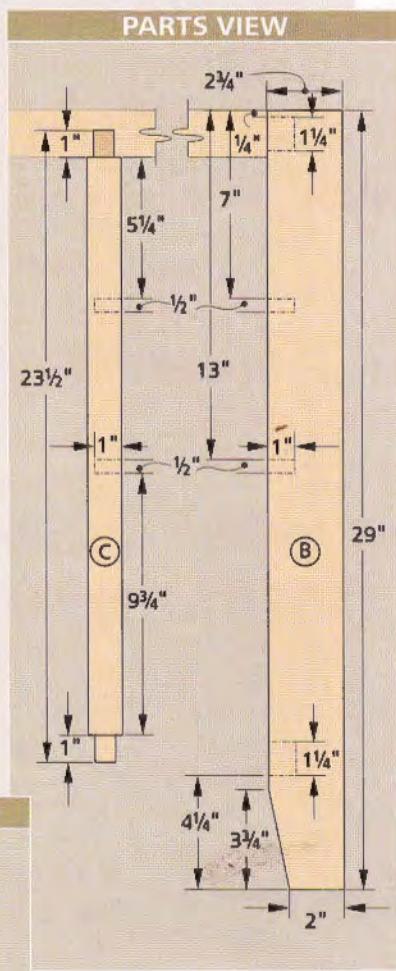
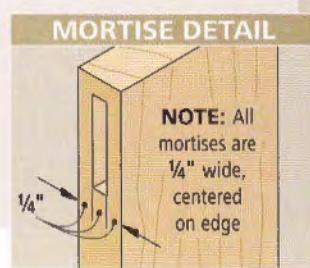
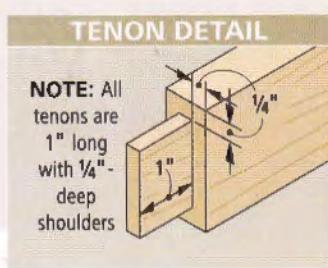
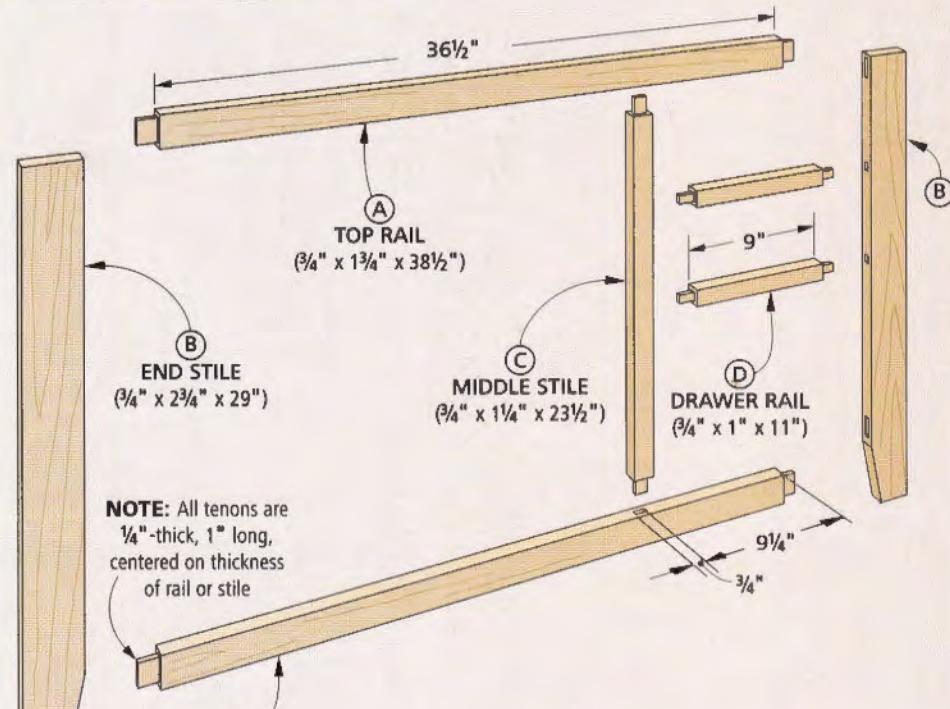
Cut the Tenons—Next, cut the tenons to fit the mortises. To accomplish this, use a dado blade mounted in the table saw (*Photo, lower left*).

Tapered Feet—The last step is to use a jig saw or band saw to trim the bottom of the end stiles to form the tapered feet (*Parts View*). After sanding the edge smooth, glue and clamp the face frame together.

Side Assemblies—Once the face frame is complete, turn your attention to the side assemblies, which consist of a divided wood frame that creates openings for a pair of solid-wood panels (*Side Assembly, below right*). The frame is made up of two side stiles (E, F), a center stile (I), and two rails (G, H).

Stub Tenons & Grooves—The frames are assembled with stub tenon and groove joints. There's nothing

FACE FRAME ASSEMBLY



complicated about these. Before you get started, though, label each piece. It's also a good idea to mark the outside face of each piece and then use it as a reference when machining the joints.

Cut Tapers—After cutting the joints, the next step is to trim the bottom of each side stile at an angle, once again forming a tapered foot.

Solid-Wood Side Panels—Now it's time to start your work on the solid-wood side panels (J). These panels are each made from $\frac{1}{2}$ "-thick hardwood. To determine the width of the panels, dry-assemble the frames, measure the openings, and then add $\frac{1}{8}$ ". That's $\frac{1}{8}$ " less than the combined depth of the grooves. Once the sides are assembled, this allows the panels to expand and contract with changes in humidity. As for the length of the panels, that simply matches the length of the center stiles.

Tongues—If you look at the *Side Assembly Illustration* again, you can see

there's a tongue on all four edges of the side panel that fits into the grooves in the frame pieces. Each tongue is formed by cutting a wide rabbet all the way around the back of the side panel (*Panel Detail*).

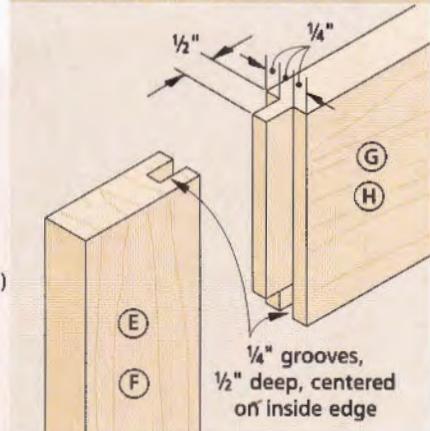
Assemble Side Panels—Now that you have finished with the tongues, you're ready to assemble the side panels. Begin by applying glue to the mating frame pieces. Then center a dab of glue on the tongue of the panel at the top and bottom, just to keep it centered in the frame. This way, the panels will "float" in the frames to allow for wood movement. After fitting it all together, be sure to clamp it as illustrated in the *Photo*, right, to ensure a flat, square assembly.

The final step in the process of constructing the side assemblies is to glue in a wedge-shaped filler strip (K). It covers the exposed groove in the tapered feet of the side panel.

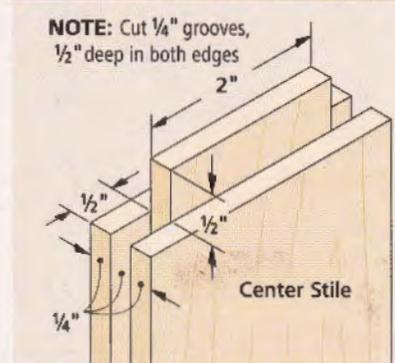


To ensure a perfectly flat side assembly, clamp it between two pairs of straight boards. The bottom board is notched for clamp clearance.

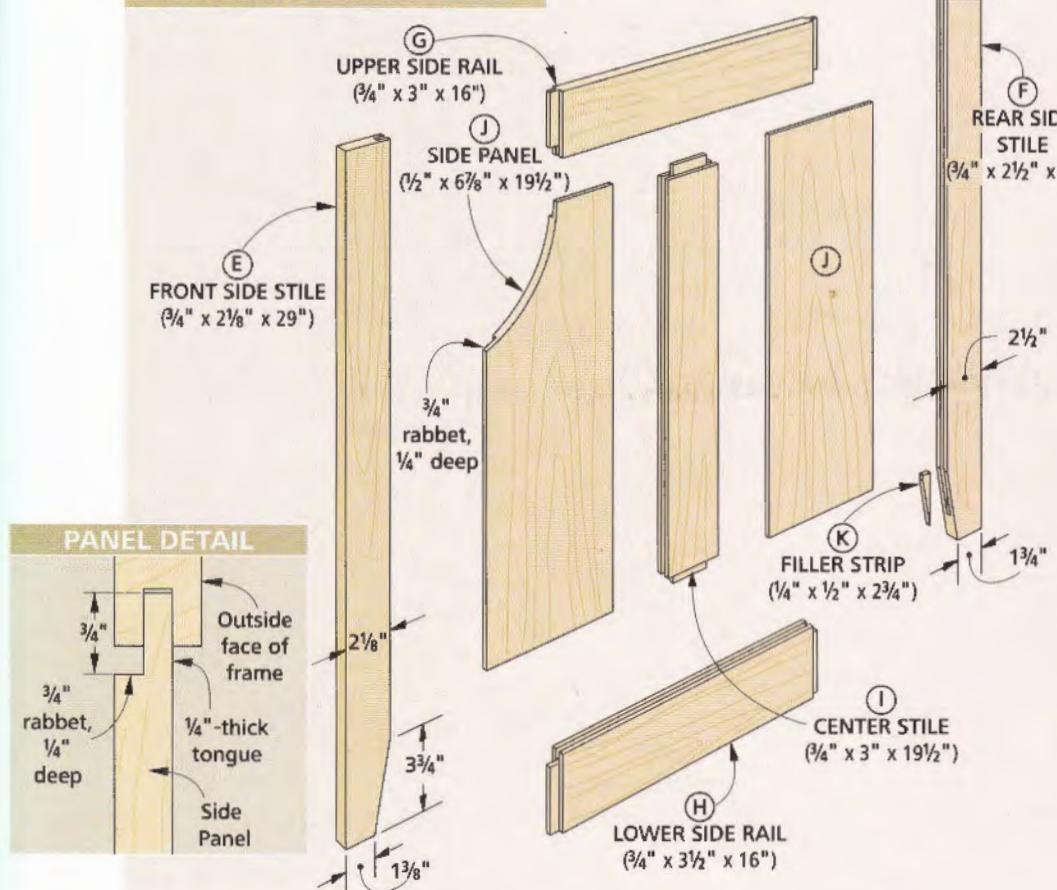
RAIL & STILE DETAIL



CENTER STILE DETAIL



SIDE ASSEMBLY



Case & Guide Construction

At this point, the two side assemblies and the face frame are complete. Connecting these three assemblies—and adding a plywood back panel, bottom, and divider—creates the case for this vanity.

Case Joinery—To see how all these parts go together, take a look at the *Case Assembly* below. Notice that the side assemblies fit into rabbets cut in the end stiles of the face frame. The back panel (L) fits into a rabbet in each of the rear side stiles.

In addition to the rabbets, there are grooves located near the bottom of the face frame, side assemblies, and back panel. These grooves hold the plywood bottom panel (M) of the cabinet. Finally, dadoes in the back and bottom panels accept a plywood divider panel (N).

All of these joints can be made by mounting a $\frac{3}{4}$ " dado blade in the

table saw and adjusting the rip fence between cuts. To cut the dadoes safely, you'll need to screw a long, straight board to the legs to keep the assemblies moving smoothly over the dado blade as you cut (see the Photo at right).

Cut the Rabbets—Like the other joints, the rabbets in the side assemblies and face frame can be cut with the dado blade. This time, however, your rip fence will have to be positioned right next to the blade.

To prevent the blade from cutting into the table saw's rip fence, be sure to attach an auxiliary fence. You should adjust the auxiliary fence so it just "kisses" the side of the blade. Then, with the face frame or side assembly riding against the fence, make a single pass to cut each rabbet.

Assembling the Case—At this point, you're ready to put the case

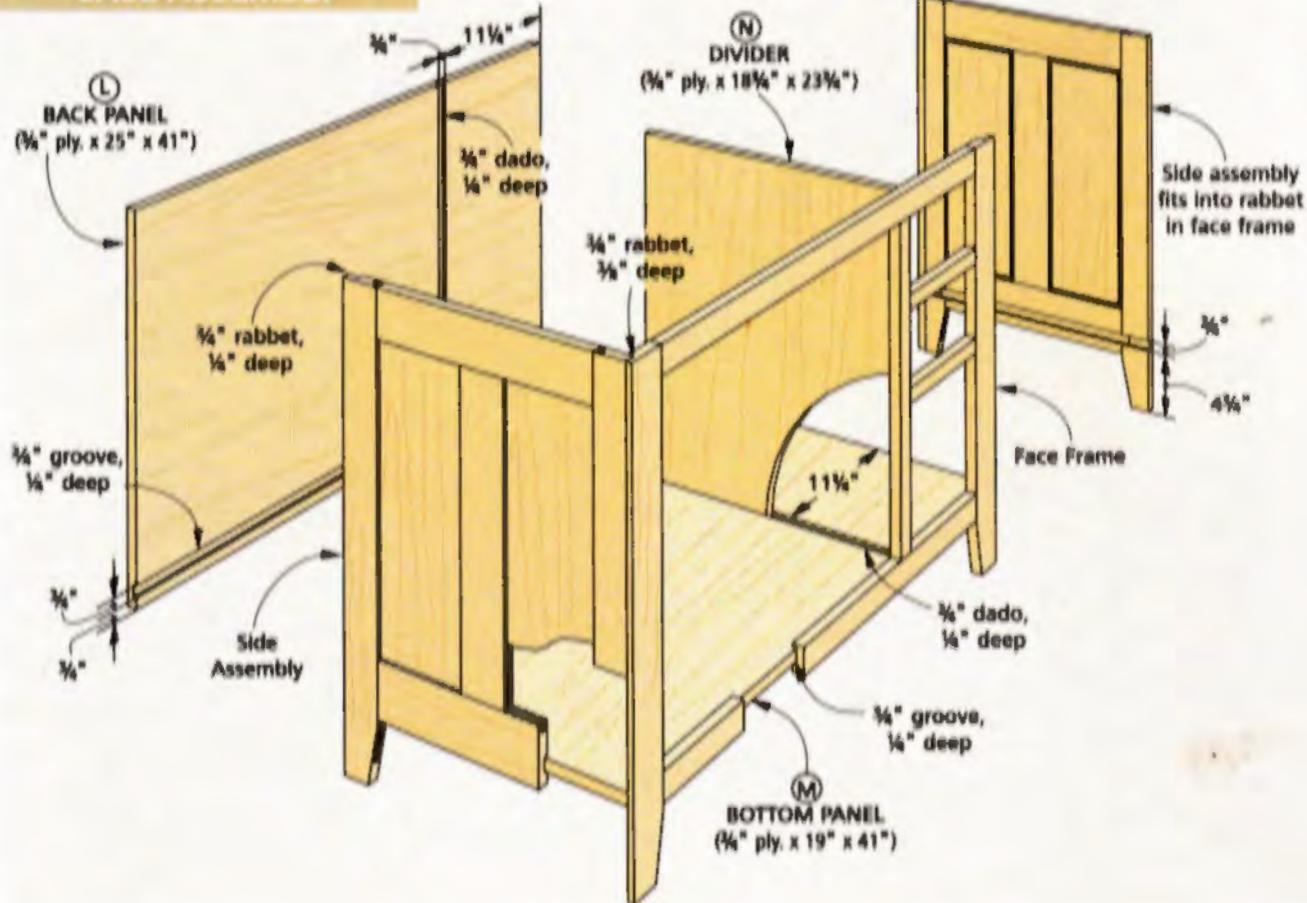
together. But before you apply any glue, dry-assemble the case first to make sure that all the case parts fit together properly.

Also, don't permanently attach the back panel at this time. The reason for this is simple: You'll want easy access to the back of the case when installing the drawer guides (page 27).

Glue up the Case—Now you can brush glue into the appropriate joints. Then, join the face frame with one side assembly, and fit the bottom panel into place.

After that step, you can attach the divider. (The divider is also glued along the front edge where it meets the face frame.) You can now add the second side assembly, and set the back panel in place temporarily to help square up the cabinet. Once you have finished, simply clamp the case together while the glue dries.

CASE ASSEMBLY



GUIDE SYSTEM

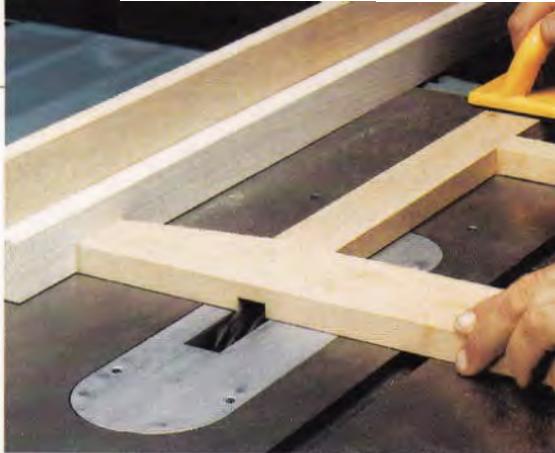
The next step is to add a system of wood guides for the drawers (*Illustration, below*). Nylon "bumpers" installed in these guides, and also in the divider, will ensure that the drawers slide smoothly (*see the Guide Details below*).

On one side of the case, the drawers ride on three L-shaped guides (O, P, Q), which are attached to spacers (R) that "build out" the guides flush with the inside edge of the face frame. On the other side, the guides are single strips of wood (P, Q) attached directly to the divider. Note that the lower guides are thinner, so they'll be flush with the bottom rail.

Make the Guides—To make the guides, size the pieces according to the dimensions shown below. Pre-drill all the mounting holes, as well as the holes for the nylon bumpers. Then glue up the L-shaped drawer guides.

Before attaching these guides, you'll need to install the spacers (R) I mentioned earlier. These are just strips of $\frac{3}{4}$ "-thick hardwood that are glued to the side assembly.

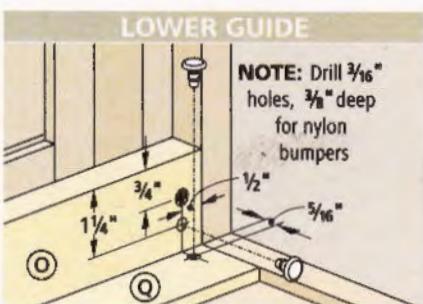
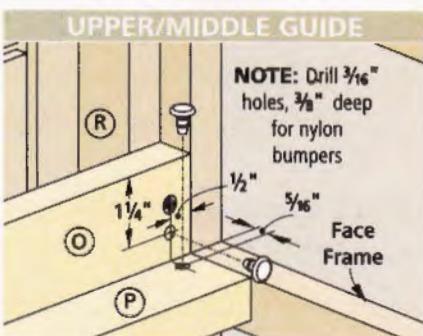
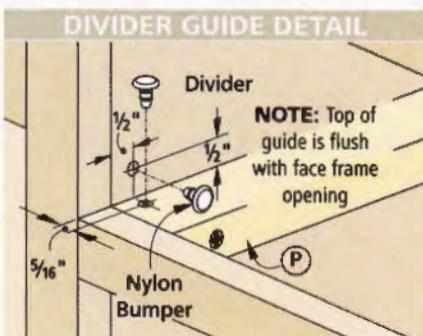
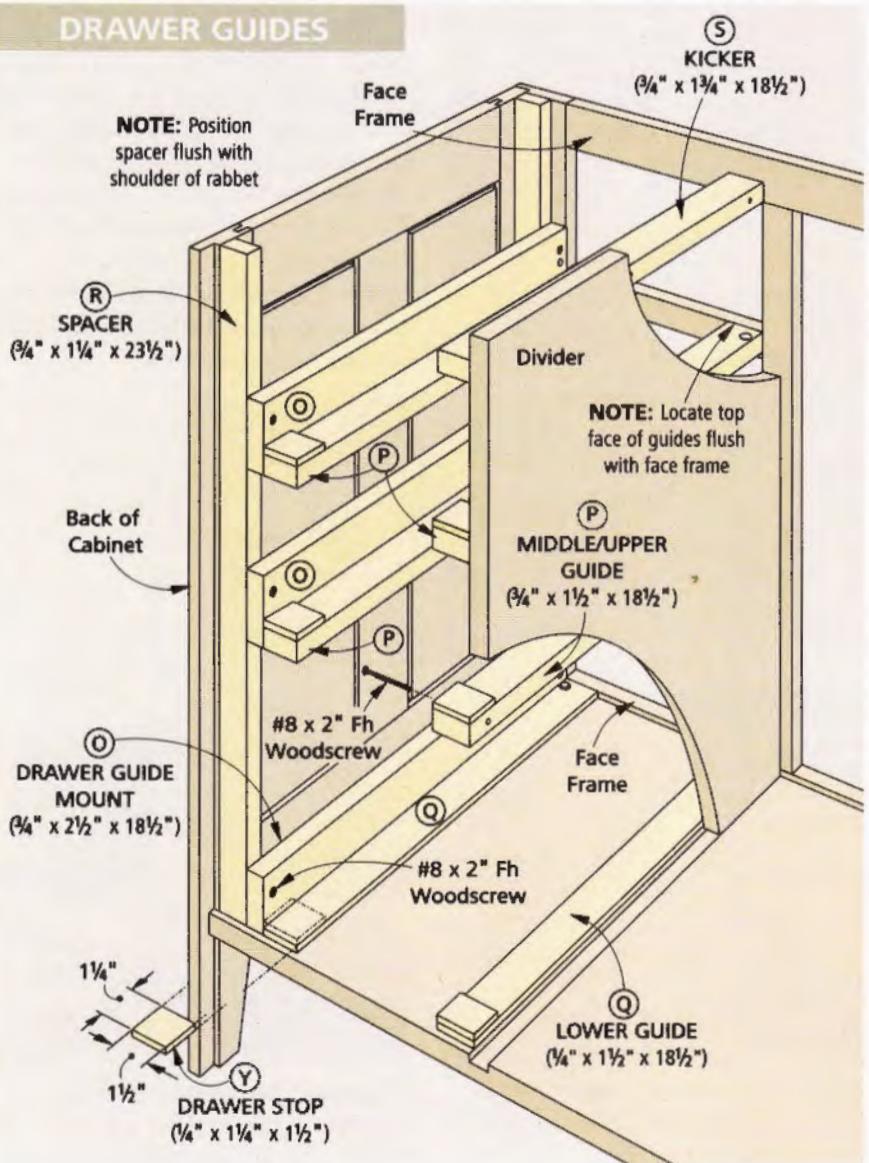
Install the Guides—At this point, it's time to install the guides. Remember, they must align from one side to the other. This prevents the drawers from binding when you slide them in and out.



When cutting the groove in the face frame and side assemblies, a board screwed to the feet provides a continuous surface that rides against the fence.

To ensure alignment, clamp each guide flush with its opening, and secure it with screws. Then press the nylon bumpers into place. Finally, to prevent the top drawer from tipping, add a hardwood kicker (S) on one side. Position it flush with the bottom edge of the face frame rail, and glue it in place.

DRAWER GUIDES



Building the Drawers & Doors

Once the guide system is completed, the three drawers can now be built to fit the openings in the face frame. Actually, the drawers are sized slightly smaller than the opening to create a uniform gap all the way around them. The drawers are also not as deep as the cabinet. A pair of stops get added to allow the drawers to close flush with the face frame.

As you recall, the drawers are two different sizes (the lower drawer is taller than the upper drawers). Their construction, however, is identical.

The drawer fronts and backs (T, U) are each made of $\frac{3}{4}$ "-thick hardwood, while the sides (V,W) are made of $\frac{1}{2}$ "-thick stock (see the *Drawer Assembly Illustration* below).

Locking Rabbet Joints—For strength and durability, I used a tried-and-true locking rabbet joint to assemble the drawers. To help a drawer withstand constant tugging, this joint features a tongue on the front and back that fits into a dado in the side (*Top View*). The three steps below will help walk you through

the process of using a table saw to cut the joint.

Before you begin machining the parts, it's a good idea to label the inside face of each piece. Using this face as a reference will ensure consistent results. Also, use a backer block for extra support when you cut the groove in the end of the drawer fronts and backs (*Fig. 1*). This will help to hold the workpiece steady during the cut.

Now it's just a matter of cutting a groove in each piece to hold a $\frac{1}{4}$ " plywood bottom. After you finish gluing up the drawers, install two nylon bumpers in the lower edge of each drawer back to help each drawer slide smoothly on the guides.

Drawer Stops—All that's left is to add the drawer stops (Y). These are wood blocks that stop the drawer flush with the front of the face frame when you close it. To determine the size of the stops, install the drawer, position it flush in front, and measure the distance between the drawer back and the end of the drawer guide. Then cut the stops to that size and glue them to the guides (see *Illustration*, page 27).

DRAWER ASSEMBLY

NOTE: Dimensions shown are for lower drawer. See Materials List on page 31 for dimensions of upper drawers.

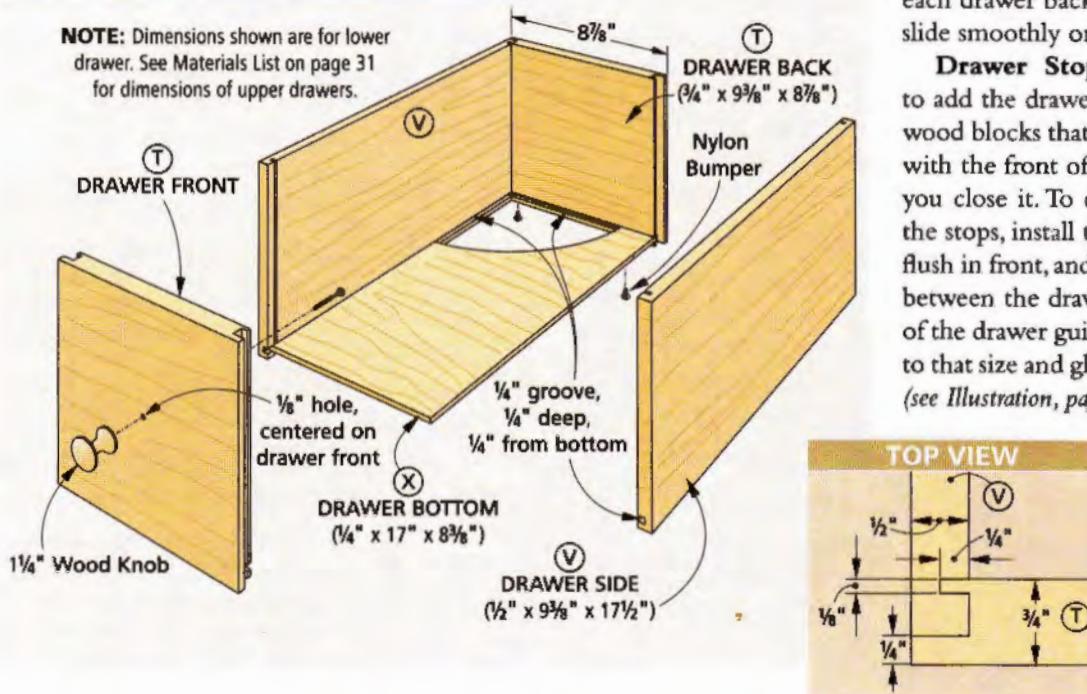
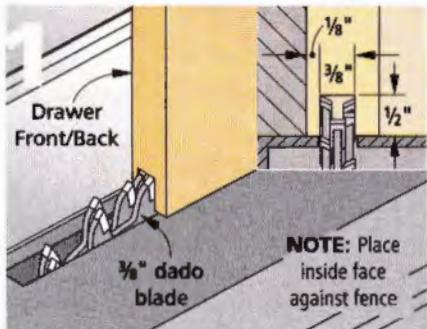
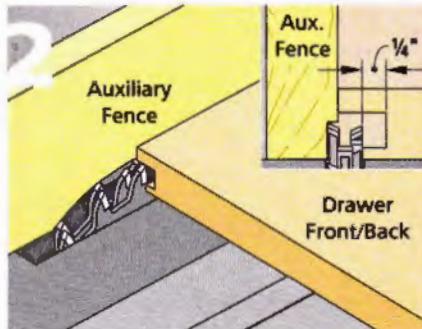


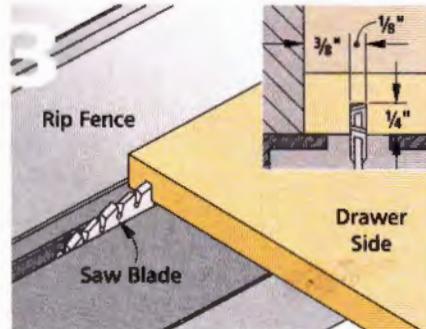
TABLE SAW TECHNIQUE: LOCKING RABBETS



1] With the drawer front (or back) standing on end, use a $\frac{3}{8}$ " dado blade to cut a groove in the end.



2] Next, butt the end of the front (or back) against an auxiliary fence, and trim the tongue to length.



3] Replace the dado blade with a standard blade, and cut a dado in the sides to accept the tongue.

BUILDING THE DOORS

The construction of the doors is identical to the side assemblies. Each door consists of a solid-wood panel surrounded by a hardwood frame (*Door Assembly*). Here again, stub tenon and groove joints are used to assemble the doors. Only this time, to add a decorative touch, I decided to install wood pegs made from cherry dowels in the corners of the frame.

Like the drawers, the doors are also sized to fit the opening, with a narrow gap all around. The dimensions for the rails (Z) and stiles (AA), which are shown below, take that into account. After you've finished sizing the pieces, then you can cut the stub tenons and grooves, as shown in the *Tenon Detail* below.

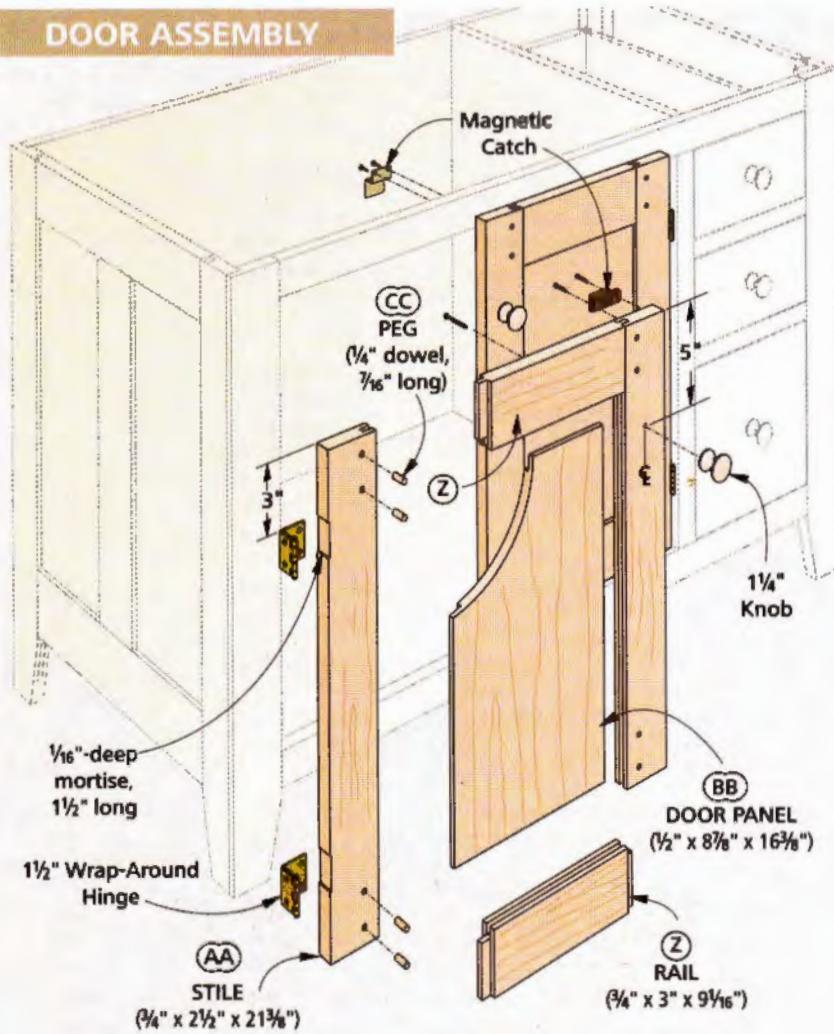
Add the Panels—The solid-wood panels are next in line. These panels are fairly wide, so you'll probably have to edge-glue boards to make panels that are wide enough to fit. Aside from that, though, the procedure you'll go through to make them is the same as that on the side assemblies. That is, cutting rabbets on all four sides of each panel. This will form the tongues that fit into the grooves in the frame pieces (see the *Panel Door Detail* on page 25).

Decorative Pegs—After you've finished gluing and clamping the doors, you can add the decorative wood pegs. The pegs are nothing more than $\frac{1}{4}$ " dowels that fit into holes drilled in the frame (*Tenon Detail*). The best procedure I found is to cut the dowels a little longer

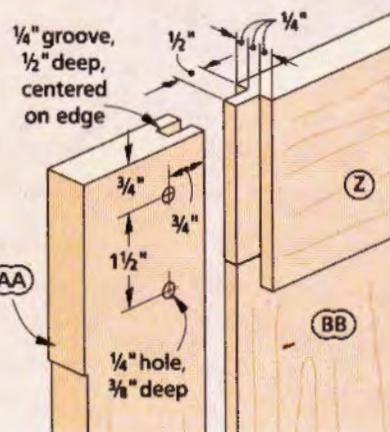
than they need to be, so that they stand a bit "proud." Then apply the glue, tap the pegs into place, and sand them flush.

Install Doors—All that's left to do at this point is to hinge the doors to the cabinet. The hinges I used are mortised into each door and surface-mounted to the edge of the face frame. This automatically establishes a $\frac{1}{16}$ " gap between the door and the frame. You should also notice that these hinges wrap around the door (*Hinge Detail*). This makes it easy to hold the hinges in place while you install screws in both the edge and the back of the door. Once you've finished securing the hinges to each door, position the doors in the opening, and secure the hinges to the face frame.

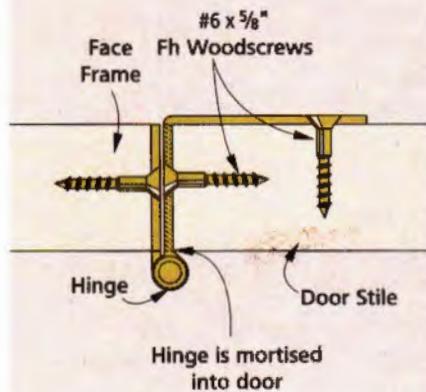
DOOR ASSEMBLY



TENON DETAIL



HINGE DETAIL





To prevent water and humidity from ruining the vanity's solid-wood top, you'll want to finish it with at least three coats of spar varnish.

Topping it Off

This bathroom vanity is just about complete. To finish it, I added a thick solid-wood top and a three-part apron assembly (*Illustrations, below*).

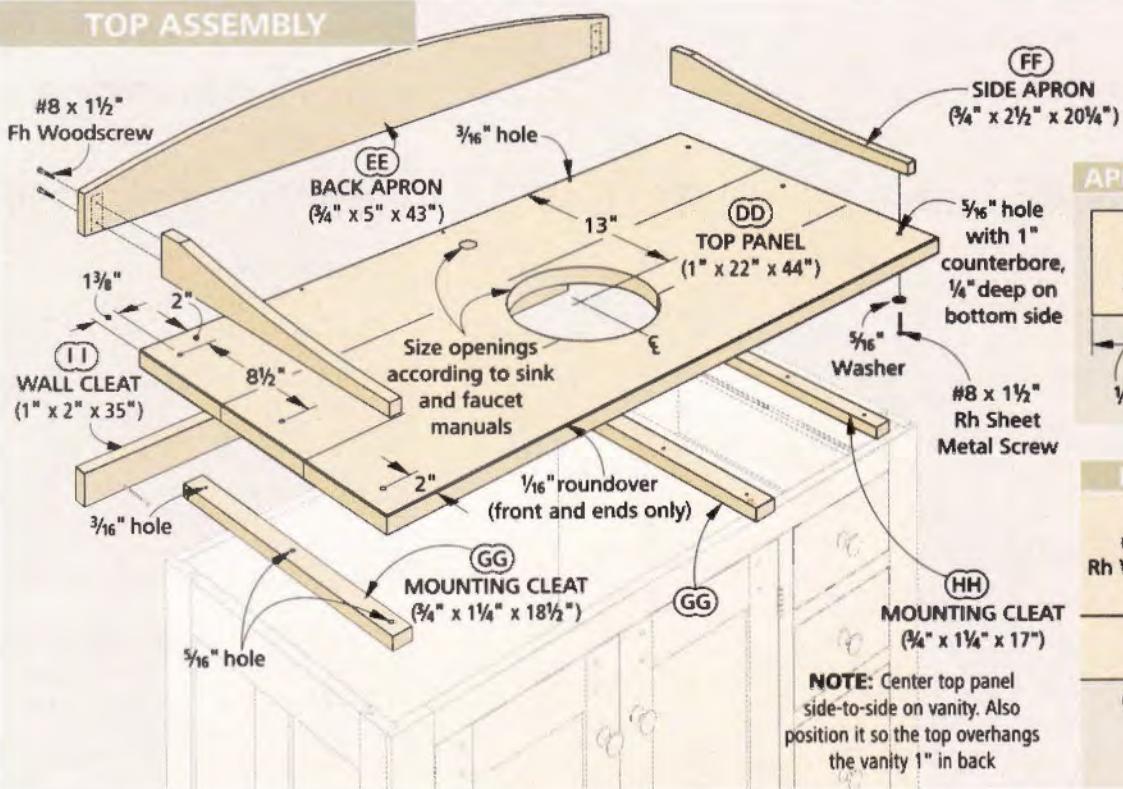
Edge-Glued Panel—The top panel (DD) consists of 1"-thick boards that are edge-glued together. Because of the moist environment of the bathroom, I'd recommend a waterproof glue. First apply the glue, and then position the clamps in an over-and-under arrangement to ensure a flat panel.

Add the Apron—Now turn your attention to the apron. It's made up of three parts: a back apron (EE) and two side aprons (FF). After cutting the curved pieces (*see Patterns below*), screw them together to form the U-shaped assembly (*Apron Corner Detail*).

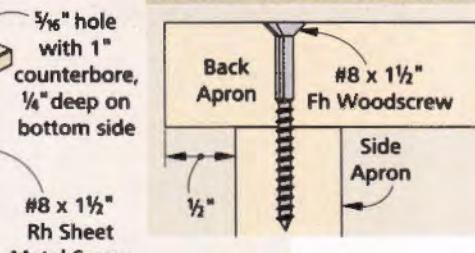
The apron is attached to the top with woodscrews. To allow for wood movement, the screws that attach the side apron pieces pass through oversize ($\frac{5}{16}$ ") holes that are counterbored on the bottom side for the screw heads (*Mounting Detail*). Since the holes for the screws that attach the back apron are in line with the grain direction, they can be standard size ($\frac{3}{16}").$

Install Top—The top is held in place with screws that pass through cleats (GG, HH), mounted to the cabinet. To prevent the top from cracking, the front and middle screws pass through oversize ($\frac{5}{16}$ ") holes in the cleat. The back screws, which pass through smaller ($\frac{3}{16}$ ") shank holes, fix the back edge of the top in place.

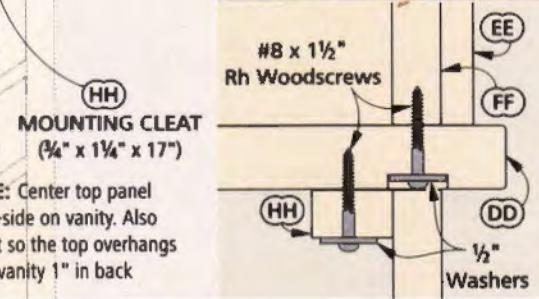
TOP ASSEMBLY



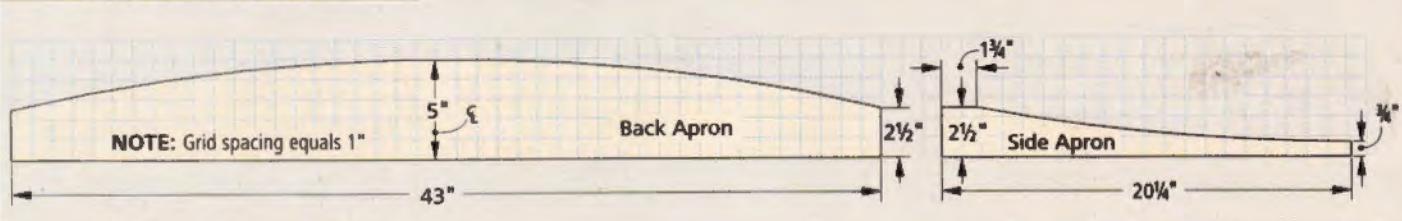
APRON CORNER DETAIL

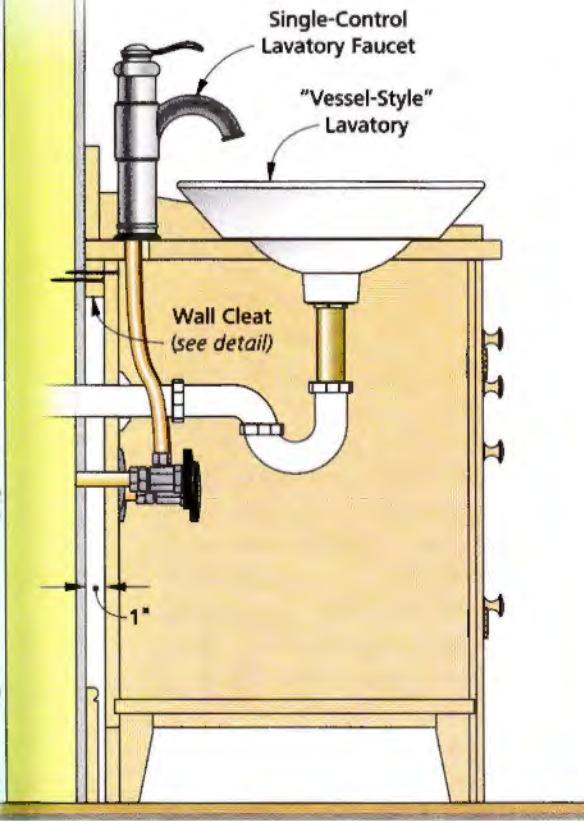


MOUNTING DETAIL



APRON PATTERNS

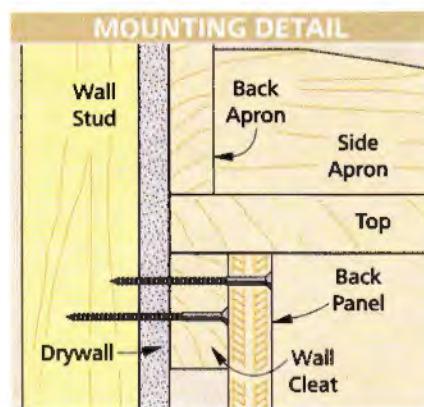




Final Installation

Typically when a furniture project is complete, you just set it in a room and wait for the compliments. With this bathroom vanity, however, there's a bit more involved.

The biggest consideration is the plumbing for the sink. Depending on whether the pipes come from the wall or the floor, you'll need to cut an opening in either the back or bottom panel.



Also, if the vanity gets bumped, it could cause a pipe to get knocked loose from the sink. So you'll want to secure it to the wall to prevent that from happening.

Wall Cleat—An easy way to do this is with a wall cleat (see *Illustration at left*). The wall cleat is a piece of wood that's thicknessed to fill the void between the back panel and the wall. Screw this cleat to the wall studs, set the vanity in place, and fasten it to the cleat with screws from inside the cabinet.

Just a note here: The screws only need to be snugged enough to keep the vanity from shifting. In fact, if you over-tighten them—and the wall isn't plumb—it could raise the feet of the vanity off the floor.

Now all that's left is to install the sink and faucet, and make the final plumbing connections. ■

MATERIAL LIST

Part	Qty	Size	Material
FACE FRAME			
A	TOP/BTM RAILS	2	3/4" x 1 3/4" x 38 1/2"
B	END STILES	2	3/4" x 2 3/4" x 29"
C	MIDDLE STILE	1	3/4" x 1 1/4" x 23 1/2"
D	DRAWER RAILS	2	3/4" x 1" x 11"
SIDE ASSEMBLIES			
E	FRONT SIDE STILES	2	3/4" x 2 1/8" x 29"
F	REAR SIDE STILES	2	3/4" x 2 1/2" x 29"
G	UPPER SIDE RAILS	2	3/4" x 3" x 16"
H	LOWER SIDE RAILS	2	3/4" x 3 1/2" x 16"
I	CENTER STILES	2	3/4" x 3" x 19 1/2"
J	SIDE PANELS	4	1/2" x 6 7/8" x 19 1/2"
K	FILLER STRIPS	4	1/4" x 1/2" x 2 3/4"
PLY. CASE PARTS			
L	BACK PANEL	1	3/4" x 25" x 41"
M	BOTTOM PANEL	1	3/4" x 19" x 41"
N	DIVIDER	1	3/4" x 18 3/4" x 23 3/4"
DRAWER GUIDES			
O	GUIDE MOUNTS	3	3/4" x 2 1/2" x 18 1/2"
P	UPPER GUIDES	4	3/4" x 1 1/2" x 18 1/2"
Q	LOWER GUIDES	2	1/4" x 1 1/2" x 18 1/2"
R	SPACERS	2	3/4" x 1 1/4" x 23 1/2"
S	KICKER	1	3/4" x 1 3/4" x 18 1/2"
DRAWERS			
T	FR./BK. (LOWER)	2	3/4" x 9 3/8" x 8 7/8"
U	FR./BK. (UPPER)	4	3/4" x 4 7/8" x 8 7/8"
HARDWARE:			
•(15) #8 x 1 1/2" Rh Woodscrews			
•(5) 1 1/4" Screw-On Shaker Knobs (Cherry)*			
•(5) #8 x 1 1/4" Fh Woodscrews (for knobs)			
•(22) #8 x 2" Fh Woodscrews			
•(6) #8 x 1 1/2" Fh Woodscrews			
•(18) Nylon Stem Bumper Glides*			
•(2 pr.) 1 1/2" Wrap-Around Hinges*			
•(2) Magnetic Catches for Inset Doors*			
•(6) 1/2" Fender Washers			
•(1) Lavatory Faucet (Kohler K-12183)			
•(1) "Vessel-Style" Lavatory (Kohler K-2200)			
* Items available from Rockler.com ; 800-279-4441			

pantry-style privacy partition



Add big-time storage space to your bathroom with this elegant cabinet that doubles as a privacy screen. A pantry-style drawer slides out to provide access to bathroom essentials, while the top case has an open area that lets you display decorative items with style.

Every bathroom can use more storage. And if you happen to have a pedestal sink, that's especially true. This privacy partition offers an elegant solution to any bathroom's storage issues. When the compartment is closed, it hides bathroom clutter from view and acts as a privacy screen between the sink and toilet. Then, when you need an item, the bottom compartment pulls out to allow access to all of your supplies.

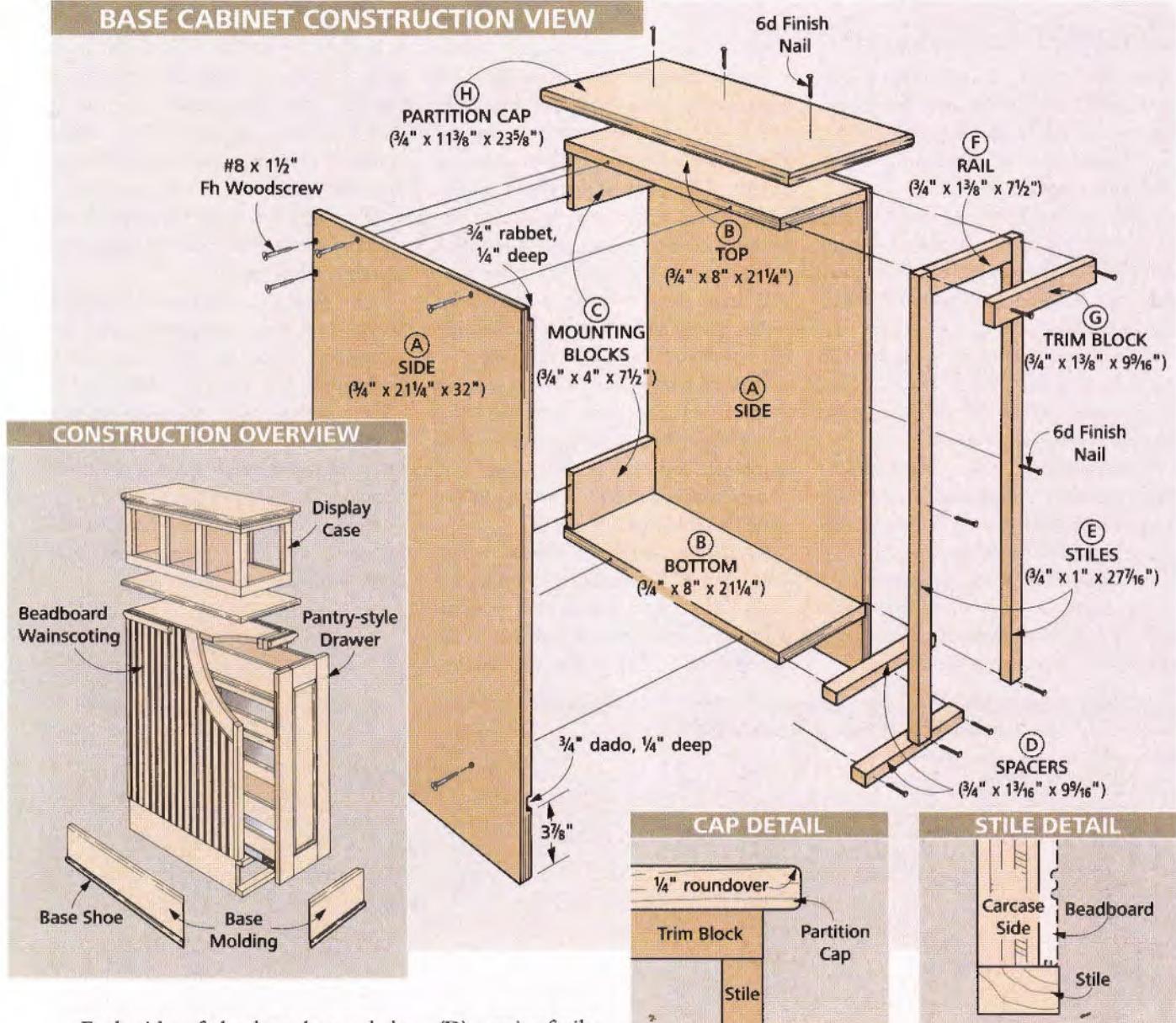
When everything is assembled, the partition will look like a single cabinet (see Photo, left). But in fact, it's actually built in two parts: a base cabinet with a pull-out pantry-style drawer, and a top case that serves as a display area. Even if you don't have a pedestal sink in your bathroom, this cabinet can still be a nice feature that will add easy and affordable style.

This partition is actually just one part of a larger bath remodel that includes a medicine cabinet (page 36), a towel rack (page 38), and beadboard wainscoting that's added to the entire room. Once the partition is installed, adding the wainscoting and base molding to the partition sides makes it look like an integral part of the room (*Construction Overview*, page 33).

BEGIN WITH THE BASE

The first step in building the partition is to assemble the base cabinet as shown in the *Construction View*, above right. It consists of two sides (A), a top and bottom (B), and two mounting blocks (C), all of which are made from $\frac{3}{4}$ " plywood.

BASE CABINET CONSTRUCTION VIEW



Each side of the base has a dado that holds the bottom in place and a rabbet that accepts the top. After you've cut these joints, the top and bottom pieces are glued and screwed into the rabbets and the dadoes.

Once the pieces are attached, cut the mounting blocks to fit between the sides, and glue and screw them in place, as well. The blocks add rigidity to the base now. Then, when it's time to install the partition in the room later on, they'll also make it much easier to fasten it to the wall.

Build out the Base— The next step is to "build out" the front of the base cabinet. This is done with several $\frac{3}{4}$ "-thick hardwood pieces: two spacers

(D), a pair of stiles (E), a rail (F), and a trim block (G). There are two specific reasons for these "build-outs." First of all, the spacers and the trim block make the partition stick out a bit further at the top and bottom. This allows the trim and molding that you will apply later to be flush with the drawer front.

Second, the stiles serve as a stopping point for the beadboard. They do this by overhanging the sides of the cabinet and giving the beadboard a surface to butt against (*Stile Detail*). This helps create a finished look when the partition is installed in the bathroom.

All of these pieces are attached with glue and nails, starting at the

bottom and then working your way up. First, attach the spacers. Then add the stiles, and fit the rail between them. Finally, add the trim block at the top of the cabinet.

Partition Cap Tops It Off— The final step in building this cabinet is to glue up a solid-wood panel for the partition cap (H). After the glue dries, cut the cap to size, and then round over everything except the back edges. Next, position the cap flush with the back of the cabinet, so it overhangs the sides and the front equally. Then finish up by nailing the cap onto the cabinet top (*Cap Detail*).

Drawer Construction

With the carcase complete, you can now build the drawer that fits inside. As you can see in the *Illustration* below, the drawer is a tall, open-sided unit with three storage trays.

The top and bottom trays are fixed in dadoes cut in the plywood drawer front/back. The center tray is adjustable and rests on shelf pins. To begin, cut the front/back pieces (I) to size, and then cut dadoes in them for the fixed trays (*Dado Detail*, below). Next, lay out and drill all the shelf pin holes on the drawer fronts and backs.

Assembling the Trays—The three storage trays are each made from melamine bottom panels (J,L) and hardwood sides (K,M). One thing to note about working with melamine—it chips easily, so you need to guard against that. To prevent this, run a strip of masking tape along the cutlines.

Notice that the bottoms of the fixed trays are $\frac{1}{2}$ " longer than the sides to fit in the dadoes, while the bottoms and sides on the adjustable trays are the same length. After cutting the pieces to size, cut grooves in the sides to accept the bottoms (*Groove Detail*) and then glue and clamp the trays together. Now, glue and clamp the fixed trays to the drawer fronts/backs, and drive screws through the fronts/backs and into the trays.

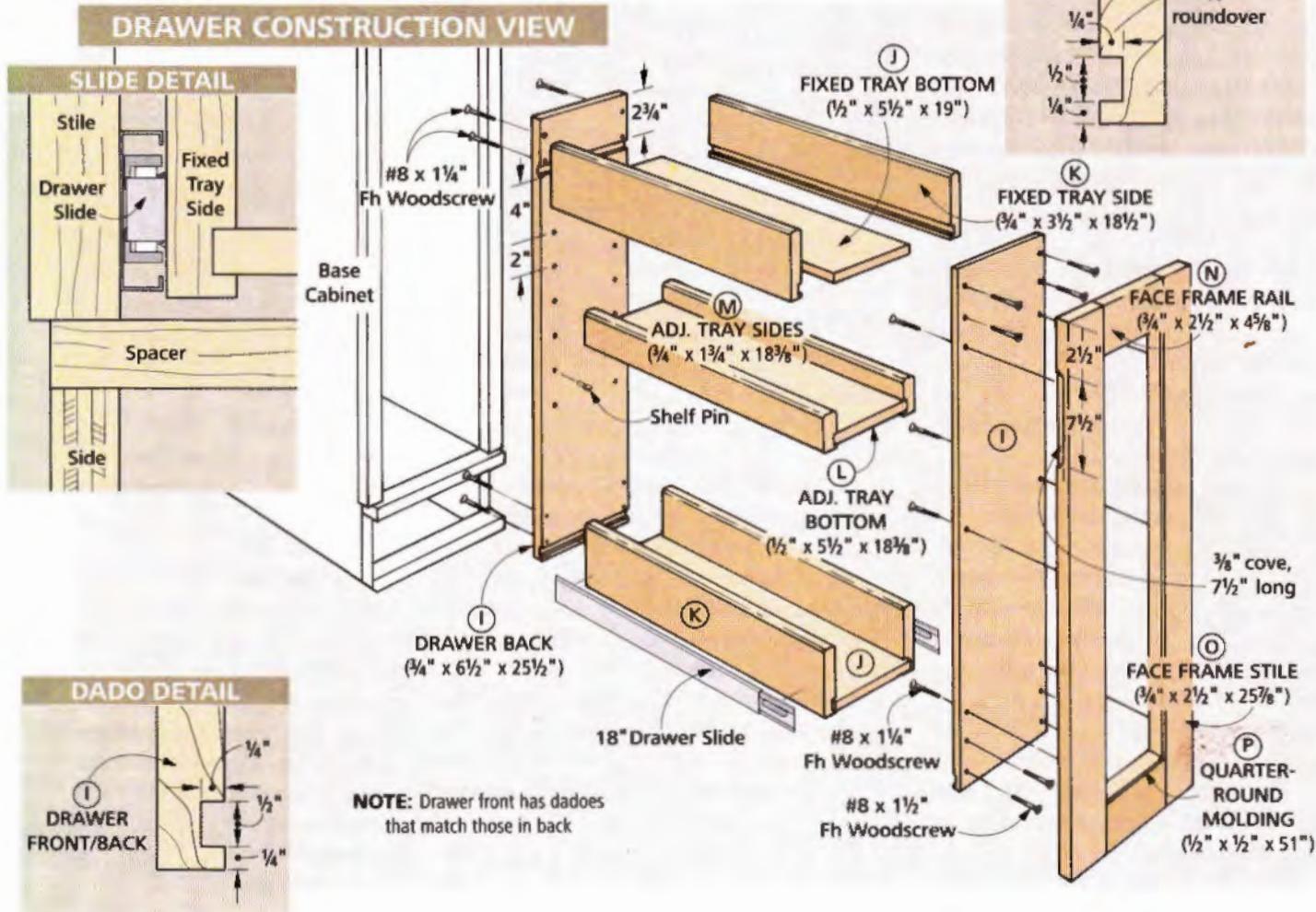
Install the Slides—Next, you can install the drawer in the cabinet. This is accomplished with a pair of full-extension drawer slides. These are easy to position and install as shown in the *Slide Detail* below.

Building the Face Frame—The final step is to dress up the drawer front with a face frame. This is done by attaching hardwood rails and stiles directly to it. To make the drawer

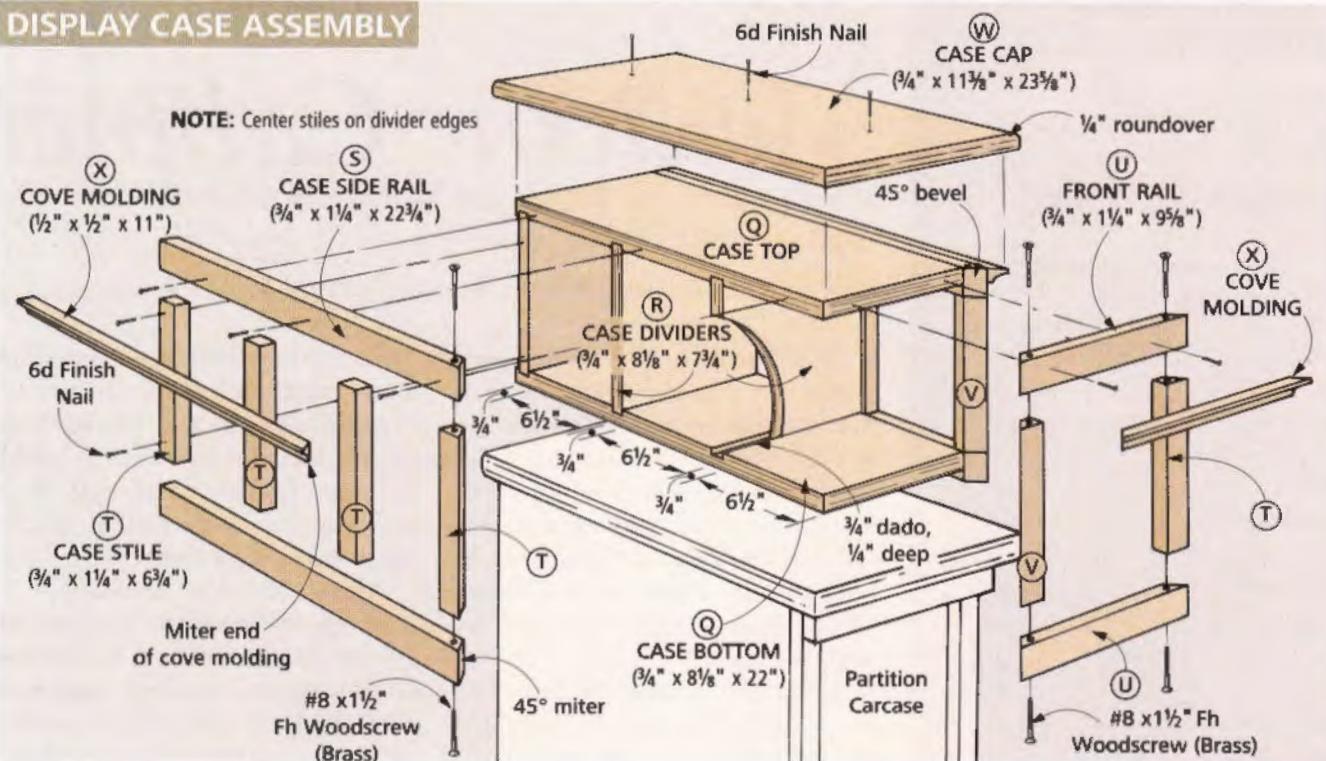
easy to open without advertising the fact that it's a drawer the way a face-mounted pull would, we added recessed drawer pulls in both edges. To make the recesses, set your router table up with a cove bit. Use stop blocks to position the stiles for the beginning and the end of the cut.

The next step is to attach the rails and stiles to the drawer front. Tape the face frame pieces to the drawer front, positioning the stiles so their outside edges are flush with the edges of the carcase. Next, open the drawer, and drive screws through the drawer front and into the rails and stiles.

Finally, miter quarter-round moldings (P), and attach them inside the frame with glue and finish nails.



DISPLAY CASE ASSEMBLY



Display Case Anatomy

The base cabinet is topped off by this open display case (*Photo, right*). The case adds height to the finished partition, but what's more, it has three nooks that you can personalize with whatever items you like. Adding decorative touches to the top case helps make the partition seem less like a wall and more like a piece of furniture.

The display case is a divided plywood box that's wrapped with hardwood frames on three sides. But notice here that the frame corners are beveled. That way, there won't be any edge grain showing. To finish, the entire display case is capped with a solid-wood panel.

Constructing the Case—To build the case, begin by cutting the top and bottom (Q) and dividers (R) to size from $\frac{3}{4}$ "-thick plywood. You'll also need to cut dadoes in the top and bottom to accept the dividers. Then to finish, simply glue and nail the dividers between the case top and bottom.

Build the Frames—With the case constructed, you're ready to make the hardwood frames. There are three

frames in all: two side frames that each consist of two rails (S) and four stiles (T), and a front frame that has two rails (U) and two stiles (T).

It's best to assemble each of these frames first, before attaching them to the case. So cut all the parts to size, and then glue and screw them together with brass screws, as shown above.

You'll also notice that the sides of each frame assembly are beveled to meet at the front of the case. The best way to cut this bevel is to tilt a table saw blade to 45° , and pass each frame assembly over the blade, just trimming the corners off each stile. Once that's done, you can glue and nail the frames to the case, as shown above.

All that's left is to add the case cap (W), and then trim this cap with cove molding. The cap is a glued-up solid-wood panel with a roundover on the two long edges and the front. Use a $\frac{1}{4}$ " roundover bit in the router table to do this. After you've finished, glue and nail it to the top of the case.

As for the cove molding (X), you can buy it pre-made at a home center.



The case adds height and decoration to the partition. A piece of tempered glass protects the case cap from scratches.

It just gets mitered to length and glued and nailed in place under the case cap.

To finish, you'll want to fill all the nail and screw holes with paintable wood filler. Sand it lightly, and prime and paint it a color of your choice. Once this has been installed on the wall, you may want to finish up the cabinet by wrapping it in beadboard, base molding, and corner round as shown in the *Photo* on page 32.



high-style mirrored Medicine Cabinet

Most medicine cabinets are functional but look drab. With its elegant trim and crown molding, this cabinet looks great without sacrificing storage space.

A lot of medicine cabinets offer ample storage, but they are sorely lacking in style. This cabinet, though, has the best of both worlds. With its fluted moldings and rosettes in the corners, it gives your bathroom the storage that it needs along with an elegant update. And the best part is that all the complex-looking trim pieces come right off the rack at a home center.

Build the Case—To make the case, start by cutting the sides (A), top and bottom (B), and back (C) to size from $\frac{1}{2}$ "-thick melamine (*Case Assembly*, page 37). Next, rabbet each end of the side pieces to hold the top and bottom.

You'll also need to cut a rabbet in the back edge of all the case pieces to hold the back panel. Now drill shelf-pin holes in the case sides. Assemble the case by gluing and screwing the top, bottom, and sides together. Then nail the back into the rabbet.

Build the Face Frame—With the case built, the next step is to apply a thick solid-wood face frame to the cabinet. It forms a lip that fits against the drywall when the medicine cabinet is installed. The frame is rabbeted to fit over the case sides. To make the frame, plane some 2x stock to $1\frac{1}{16}$ " thick.

Then, working with four extra-long blanks, rabbet each piece.

Next, miter the rails (D) and stiles (E) that make up the frame to length, and face-nail them to the case. Work your way around the case as you do this to ensure tight miters.

Apply Crown Molding—To dress up the medicine cabinet, we applied crown molding to the top of the case. The molding attaches to a $\frac{3}{4}$ "-thick cap (F), which is glued and nailed to the top of the cabinet. Notice that there are three pieces of crown molding: a front molding (G), and two "returns" (H, I) that create a finished look. Use a miter saw to cut the moldings to length. Then nail them to the cap.

Mirrored Door Details—The mirrored door is next. It consists of a hardwood frame that is trimmed with fluted molding and corner rosettes. A rabbet in the back of the frame houses a mirror and a hardboard backer panel. Turnbuttons screwed into the frame help to hold the mirror and backer panel in place (*Door Elevation*).

Building the Frame—To build the door frame, start by mitering the rails (J) and stiles (K) to length. Screw the face frame together, and then rout a

MATERIAL LIST

Part	Qty	Size	Material
A CASE SIDES	2	$\frac{1}{2}$ " x $3\frac{1}{2}$ " x $30\frac{1}{2}$ "	Melamine
B CASE TOP/BOTTOM	2	$\frac{1}{2}$ " x $3\frac{1}{2}$ " x 20"	Melamine
C CASE BACK	1	$\frac{1}{2}$ " x 20" x 30"	Melamine
D FACE FRAME RAILS	2	$1\frac{1}{16}$ " x $1\frac{1}{4}$ " x 22"	Pine
E FACE FRAME STILES	2	$1\frac{1}{16}$ " x $1\frac{1}{4}$ " x 32"	Pine
F CROWN CAP	1	$\frac{3}{4}$ " x $2\frac{3}{4}$ " x $22\frac{3}{8}$ "	Poplar
G CROWN MLDG. FRONT	1	$\frac{9}{16}$ " x $3\frac{1}{4}$ " x $25\frac{5}{16}$ "	Pine
H CROWN MLDG. RIGHT	1	$\frac{9}{16}$ " x $3\frac{1}{4}$ " x $4\frac{1}{4}$ "	Pine

Part	Qty	Size	Material
I CROWN MLDG. LEFT	1	$\frac{9}{16}$ " x $3\frac{1}{4}$ " x $4\frac{1}{4}$ "	Pine
J DOOR FRAME RAILS	2	$\frac{3}{4}$ " x $2\frac{3}{4}$ " x 22"	Poplar
K DOOR FRAME STILES	2	$\frac{3}{4}$ " x $2\frac{3}{4}$ " x $31\frac{1}{8}$ "	Poplar
L BACKER PANEL	1	$\frac{1}{4}$ " x $17\frac{7}{8}$ " x $27\frac{3}{8}$ "	Hardboard
M FLUTED RAILS	2	$\frac{1}{2}$ " x $2\frac{1}{8}$ " x $17\frac{1}{8}$ "	Pine
N FLUTED STILES	2	$\frac{1}{2}$ " x $2\frac{1}{8}$ " x $26\frac{1}{8}$ "	Pine
O ROSETTES	4	$\frac{5}{8}$ " x $2\frac{1}{2}$ " x $2\frac{1}{2}$ "	Pine

rabbet for the mirror and backer panel. The bit will leave rounded corners, which you can square up with a chisel.

Next, use a $\frac{1}{2}$ " cove bit to rout a finger pull on the bottom rail of the frame. The length and placement of the finger pull isn't critical, so you can freehand rout this detail.

Trim and Finish— Now that the structural part of the door is built, it's time to add the decorative pieces: the fluted rails (M), stiles (N), and the corner rosettes (O).

Install the rosettes with glue and finish nails (*Rosette Detail*, page 39). Then, after you've cut the fluted rails and stiles to fit between the rosettes, glue and nail them on. Once the molding is nailed to the frame, you can fill the nail holes and prime and paint the door.

Closing Details— There are just a few hardware pieces to put on before you can install the cabinet. Start with the hinges. We attached no-mortise hinges to the door frame. Pre-drill the screw holes with a self-centering bit, and then drive the hinge screws by hand to avoid damaging the delicate brass screws.

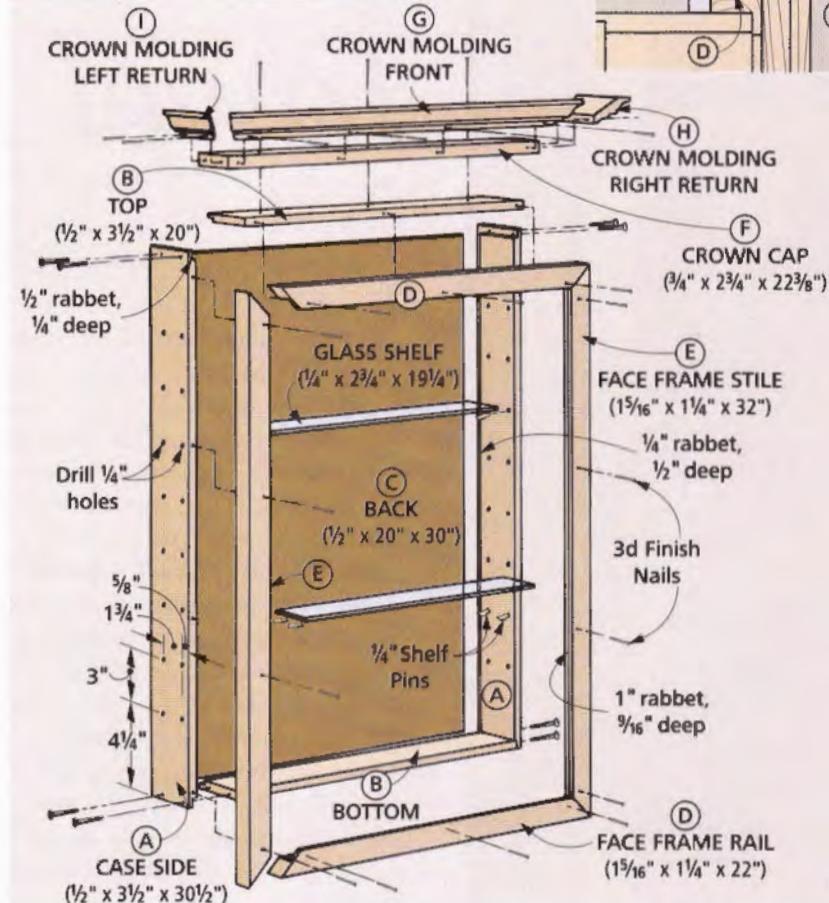
Now line the door up to the cabinet, and pre-drill the cabinet for the hinge screws. Again, screw the hinges to the cabinet frame by hand.

Next, install magnetic catches inside the cabinet, and mount the strike plates on the back of the door. Finally, fit the mirror and backer panel in the rabbeted frame, and secure them with turnbuttons.

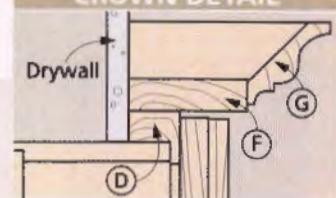
Installing the Cabinet— This cabinet won't fit in a standard $14\frac{1}{2}$ " stud space, so you'll need to cut out a stud to create an opening where the cabinet will be installed. Once you have created this opening, you'll need to add any bracing as necessary. Also frame around the cabinet opening to provide a surface for nailing the cabinet frame in place.

After that, it's just a matter of sliding the case into position and securing it by driving nails through the cabinet sides and into the framing members. A bead of caulk will hide any gaps between the cabinet and the wall.

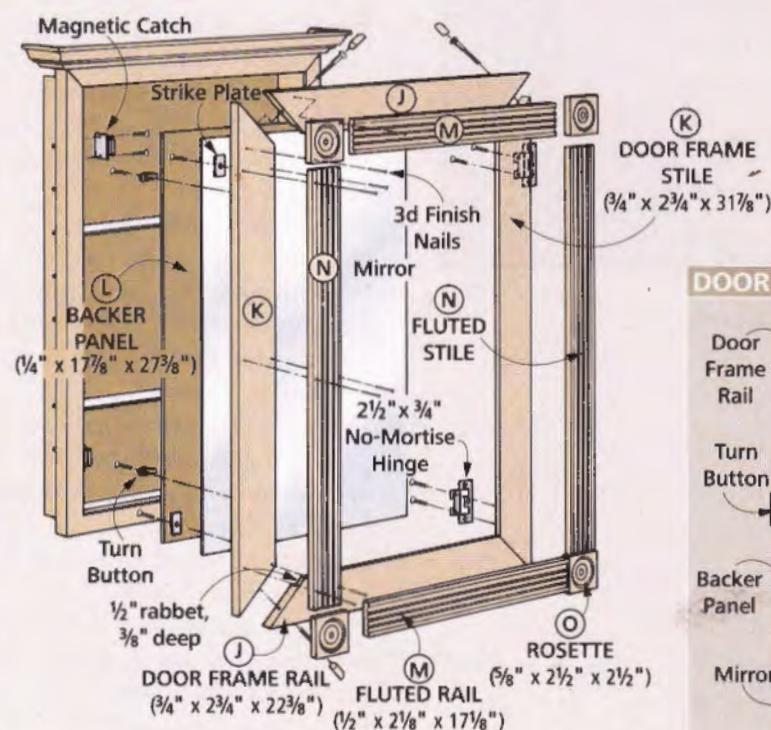
CASE ASSEMBLY



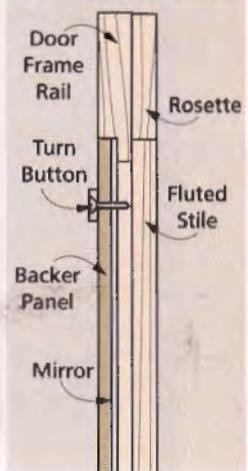
CROWN DETAIL



DOOR ASSEMBLY



DOOR ELEVATION





built-in Towel Rack

If your bathroom is tight on space, why not use the space in the wall to add more storage? This towel rack uses the area between two wall studs to do just that.

As a complement to the privacy partition and medicine cabinet projects, you may want to consider this built-in towel rack. It offers multiple storage shelves and two fold-out towel arms, all in the space between two wall studs.

Sizing the Towel Rack—

Speaking of those wall studs, the first step in building this towel rack is to determine where you want the project to be located. Then it's a simple matter of cutting the opening and measuring the space between the studs to determine the size of the rack.

The dimensions shown at right should be fine if the space between your studs is a standard 14½"-wide. If the distance between the studs is different, you'll have to adjust the towel rack dimensions accordingly.

Build the Case—Once you've got all the numbers worked out, you can start on the case by cutting the sides (A), top, and bottom (B) to size from ¾"-thick stock (*Construction View*, page 39).

To hold the top and bottom, you'll need to cut a rabbet in each end of the sides (*Rack Corner View*). Also, cut a groove near the back edge of all the case pieces to accept a back made from ¼" beadboard plywood.

Once the grooves and rabbets are cut, you can drill a series of ¼" holes in the case sides to accept shelf pins. Lay out the location of the holes using the dimensions shown in the *Construction View* at right.

Now cut the beadboard back (C) to final size, and then assemble the cabinet with glue and screws.

Measure & Cut Shelves—With the case assembled, measure the inside

of the cabinet and cut the shelves (I) to fit from ¾"-thick stock. I routed a ½" roundover on the top and bottom edges of the front of each shelf.

Construct the Frames—The next step is to build two frames: a face frame that gets applied to the front of the case, and a trim frame (*Frame and Molding Assemblies*). The face frame adds rigidity to the case, and the trim frame, made of store-bought molding, serves to decorate the front of the case.

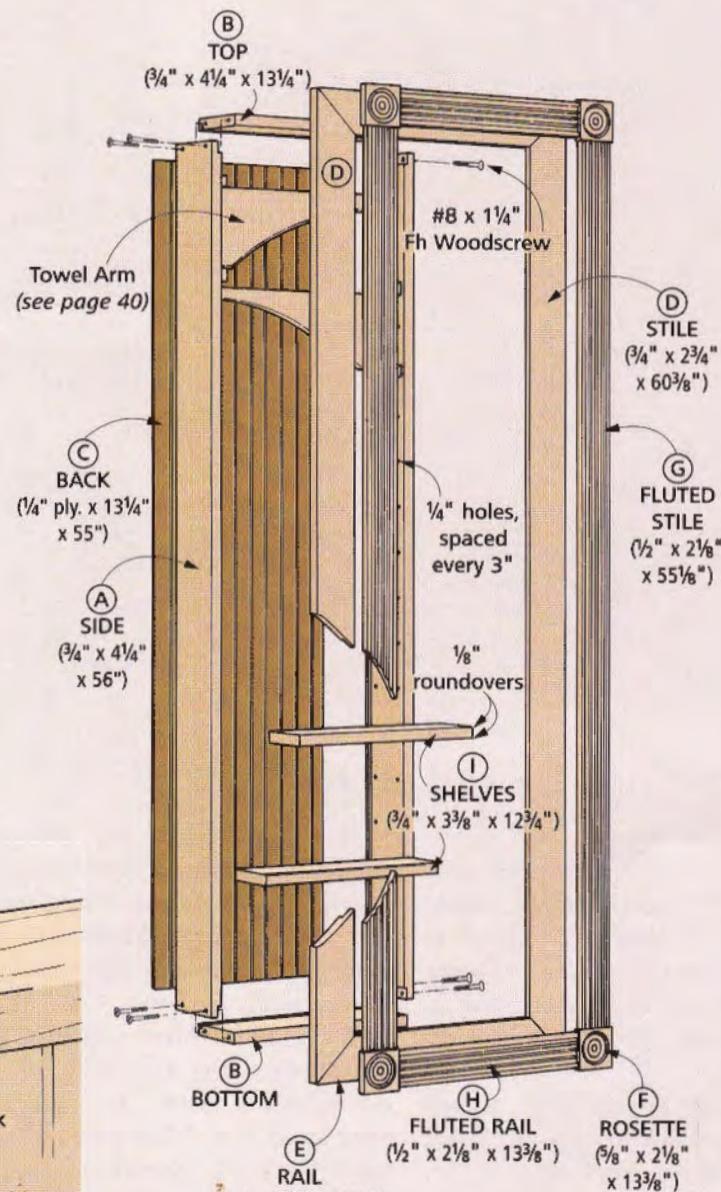
The face frame overhangs the sides of the case and serves as a stop when the towel project gets installed in the wall. Note how the frame fits directly against the drywall, which also helps to hide the edges of the cutout. In addition, the face frame provides a solid surface for nailing on the fluted casing and rosettes of the trim frame.

To make the stiles (D) and rails (E) for the face frame, start with extra-long pieces of stock, rip them to width, and then cut rabbets in the inside edge of each piece to fit over the case (*Corner Detail*, page 39). Now miter the stiles and rails, fitting them to the case as you go.

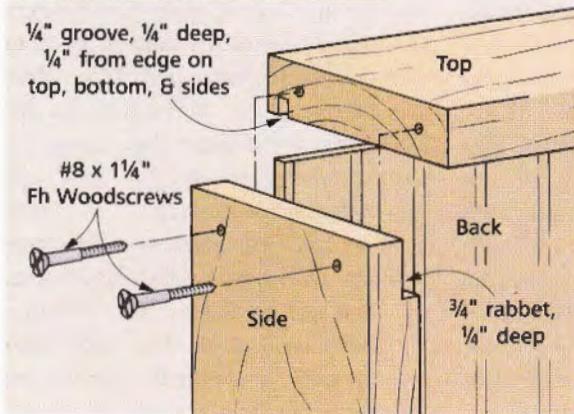
Once the corners of these frame pieces match up properly, go ahead and glue and nail the pieces directly to the edges of the case.

Apply Trim—Now it's time to apply the store-bought molding that makes up the trim frame. I used fluted molding and rosette corner blocks to create an ornate facade. The nice thing about this is there's no need to custom-make any molding or worry about fitting miter joints. Simply start by gluing and nailing a rosette (F) at each corner. Notice that the

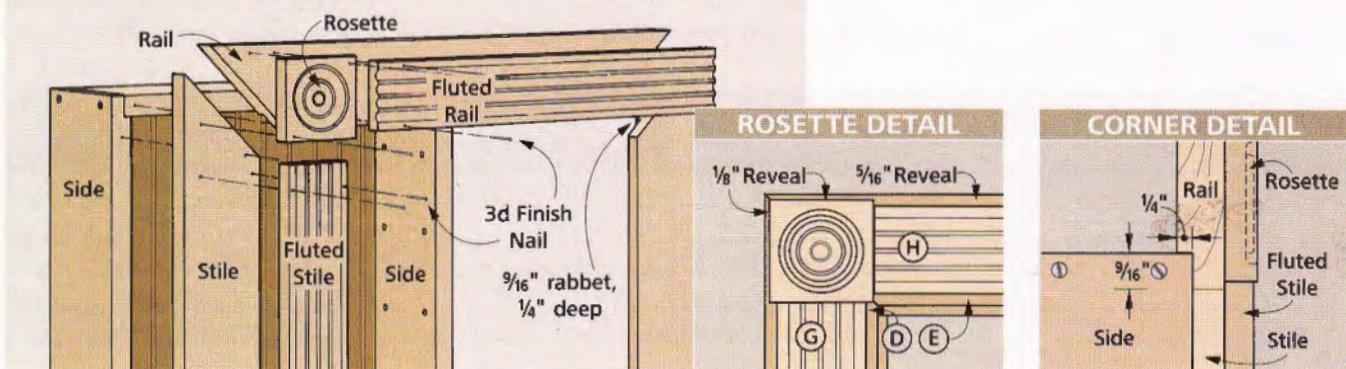
TOWEL RACK CONSTRUCTION VIEW



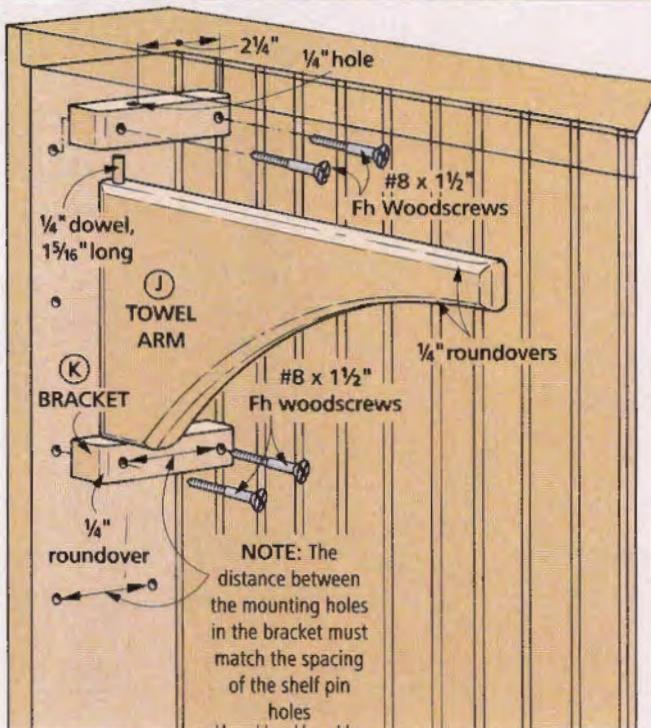
RACK CORNER VIEW



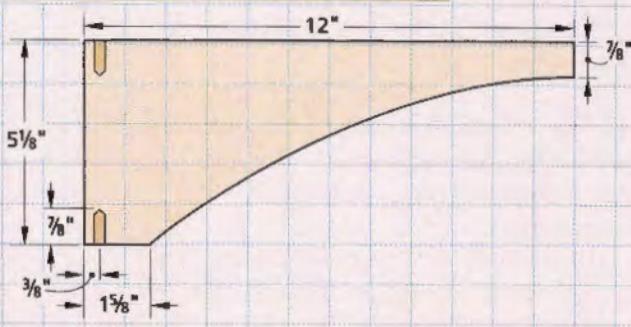
FRAME AND MOLDING ASSEMBLIES



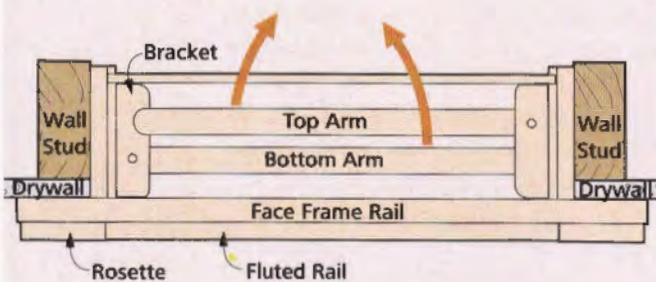
TOWEL ARM & BRACKET ASSEMBLY



TOWEL ARM PATTERN



TOP VIEW



Swing-Out Towel Arms

The swing-out arms are one of the handiest features of this towel rack (*Towel Arm & Bracket Assembly*, above). Each arm (J) fits between two brackets (K), which screw into shelf pin holes in the towel rack. These arms swing in and out on wood dowels that serve as pivot pins.

Make the Brackets—I started by making the brackets. For the towel arm assembly to work properly, it's absolutely critical that the brackets be made as accurately as possible.

A nice way to do this is to start with a long piece of 3 1/2"-wide stock. Later on, you can crosscut both brackets to width from this piece. But first, round over both of the top edges of this piece on the router table.

Now head over to the drill press, and drill two holes near both ends of this longer workpiece. These holes will serve as the pilot holes that you see above for screwing the brackets to the case sides.

With the pilot holes drilled, you can crosscut the two ends of the workpiece to form the brackets. Now drill one more hole in each bracket (shown above) to capture the dowel that will be used as a pivot pin for the towel arm. Repeat this entire process one more time to form four identical brackets.

Add the Towel Arms—The next step is to make two identical towel arms. These are pieces of 3/4"-thick stock that get cut into a curved

shape. To end up with identical pieces, it's best to cut two blanks to size for the arms, and then secure the blanks to one another face to face with double-sided tape. This way, you can cut them out on the band saw at the same time using the pattern shown above.

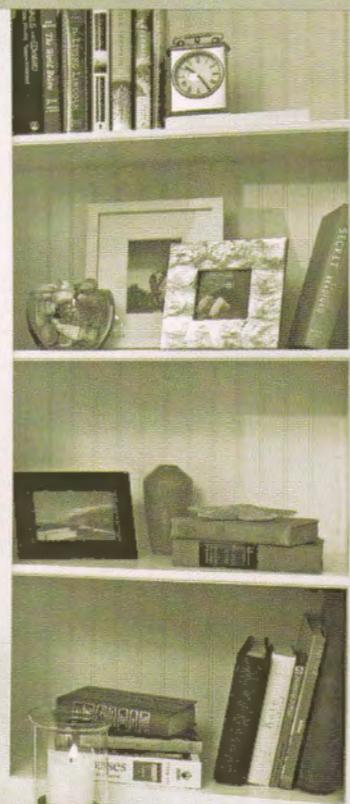
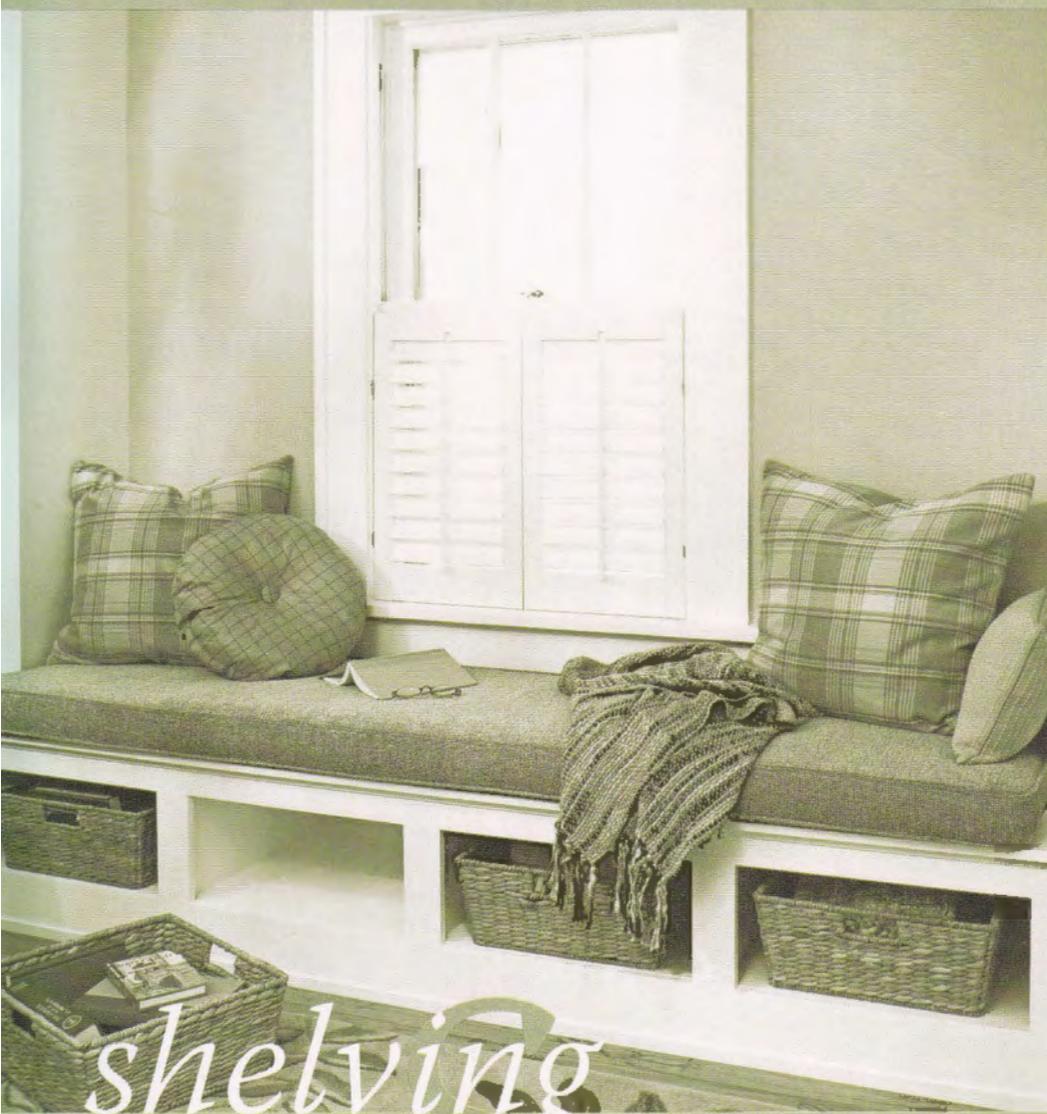
Once the arms are cut to shape, go back to the drill press, and drill two holes in each arm for the dowels that the arms will pivot on.

Finally, separate the two arms from one another, and round over all the long edges of each arm on the router table. On the short edges, shape the roundovers with sandpaper or a file. Then glue in the dowels, and install the arms as shown above. ■

MATERIAL LIST

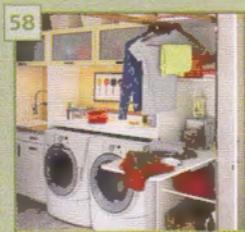
Part	Qty	Size	Material
A RACK SIDES	2	3/4" x 4 1/4" x 56"	Poplar
B TOP/BOTTOM	2	3/4" x 4 1/4" x 13 1/4"	Poplar
C BACK	1	1/4" x 13 1/4" x 55"	Beadboard Ply.
D STILES	2	3/4" x 2 3/4" x 60 1/8"	Poplar
E RAILS	2	3/4" x 2 3/4" x 18 1/8"	Poplar
F ROSETTES	4	5/8" x 2 1/2" x 2 1/2"	Pine

Part	Qty	Size	Material
G FLUTED STILES	2	1/2" x 2 1/8" x 55 1/8"	Pine
H FLUTED RAILS	2	1/2" x 2 1/8" x 13 3/8"	Pine
I SHELVES	2	3/4" x 3 1/8" x 12 3/4"	Poplar
J TOWEL ARMS	2	3/4" x 5 1/8" x 12"	Poplar
K BRACKETS	4	1" x 3/4" x 3 1/2"	Poplar



shelving bookcases

Few built-in features increase a room's "wow" factor quite like a set of bookcases. And you'll be amazed at how affordable this look can be. In addition, each of these great projects only takes a weekend or two to build. So not only are you saving money, but time, too.



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Built-In Book Nook

54

Floating Display Shelves

58

Laundry Room Makeover





BUILT-IN BookNook

Open a new chapter in the story of your home with this built-in window seat and bookcase. It brings stylish seating, storage, and display space to any room. Best of all, you can put it all together in a couple of weekends for about \$500.

Almost every home could benefit from additional storage, more seating, and an influx of extra style. This built-in book nook delivers all three. The project starts with a broad bench seat that offers a comfortable place to kick back and relax while you read under the warm glow of built-in puck lights overhead. Underneath the bench, you'll find a serious amount of storage space.

Two tall bookcases that flank the bench are the perfect place for books, of course. But they're also great for displaying your favorite collectibles.

The transformation this project brings to the style and feel of a room is nothing less than astonishing. And no less amazing is that the project is easy to build, a breeze to install, and remarkably affordable.

All you need are standard woodworking tools, some plywood and solid poplar stock, a couple weekends, and a few hundred dollars. Of course, you'll also want the solid advice offered in the upcoming pages that shows you how to plan and build a book nook to fit your space.



Even this relatively bare room offered plenty of information about building the book nook. The painted woodwork and beaded paneling offered styling cues that help the book nook design blend in. An electrical outlet and cold-air return were accommodated in the project design.

Plan For Your Space

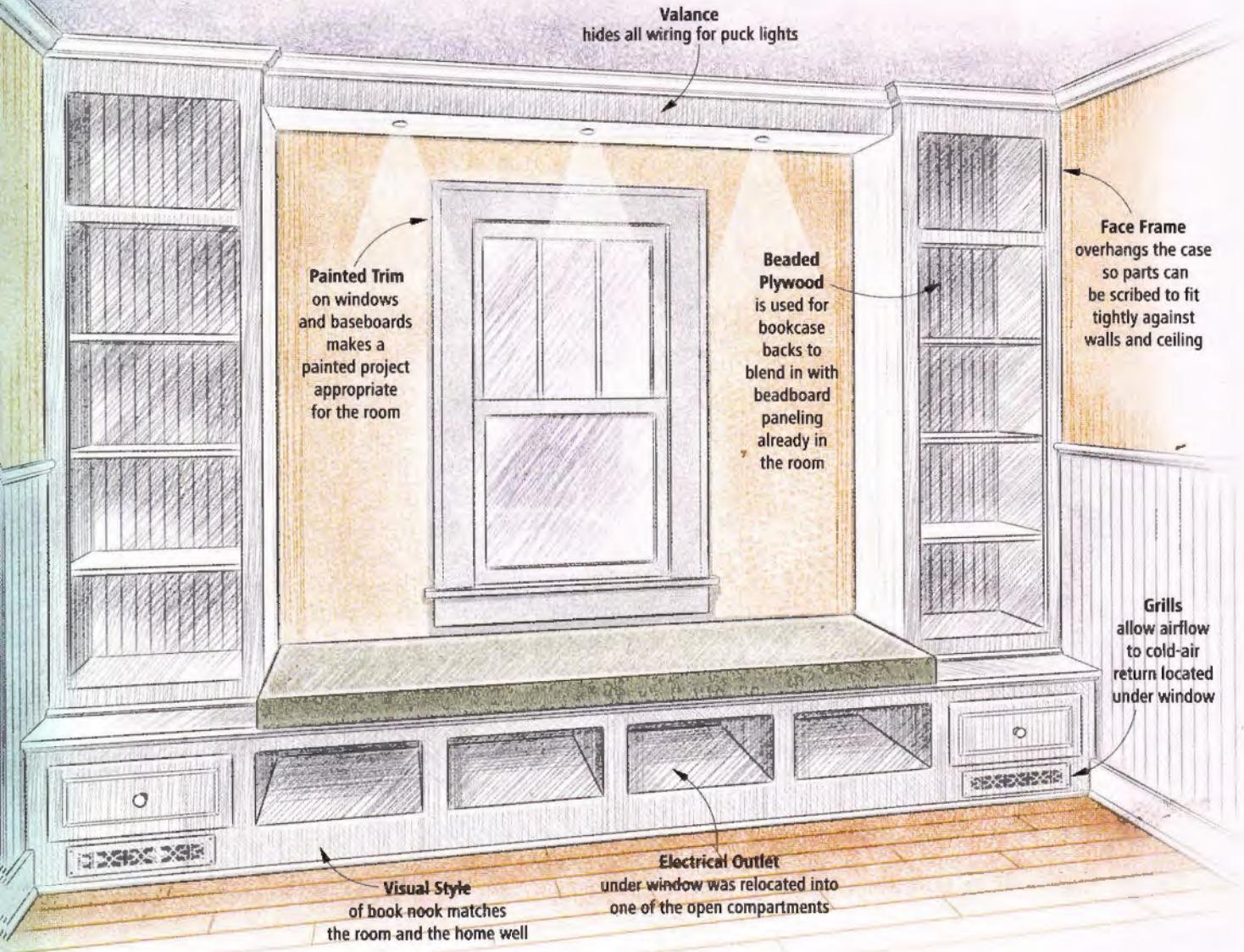
All projects require planning before getting underway. That's no secret. But to get an integrated, seamless look with a built-in project, the planning process is especially important.

Build to Fit—Obviously, you need to make sure the project will fit the room where it will be installed. That means you'll need to thoroughly survey the location and record all the critical measurements.

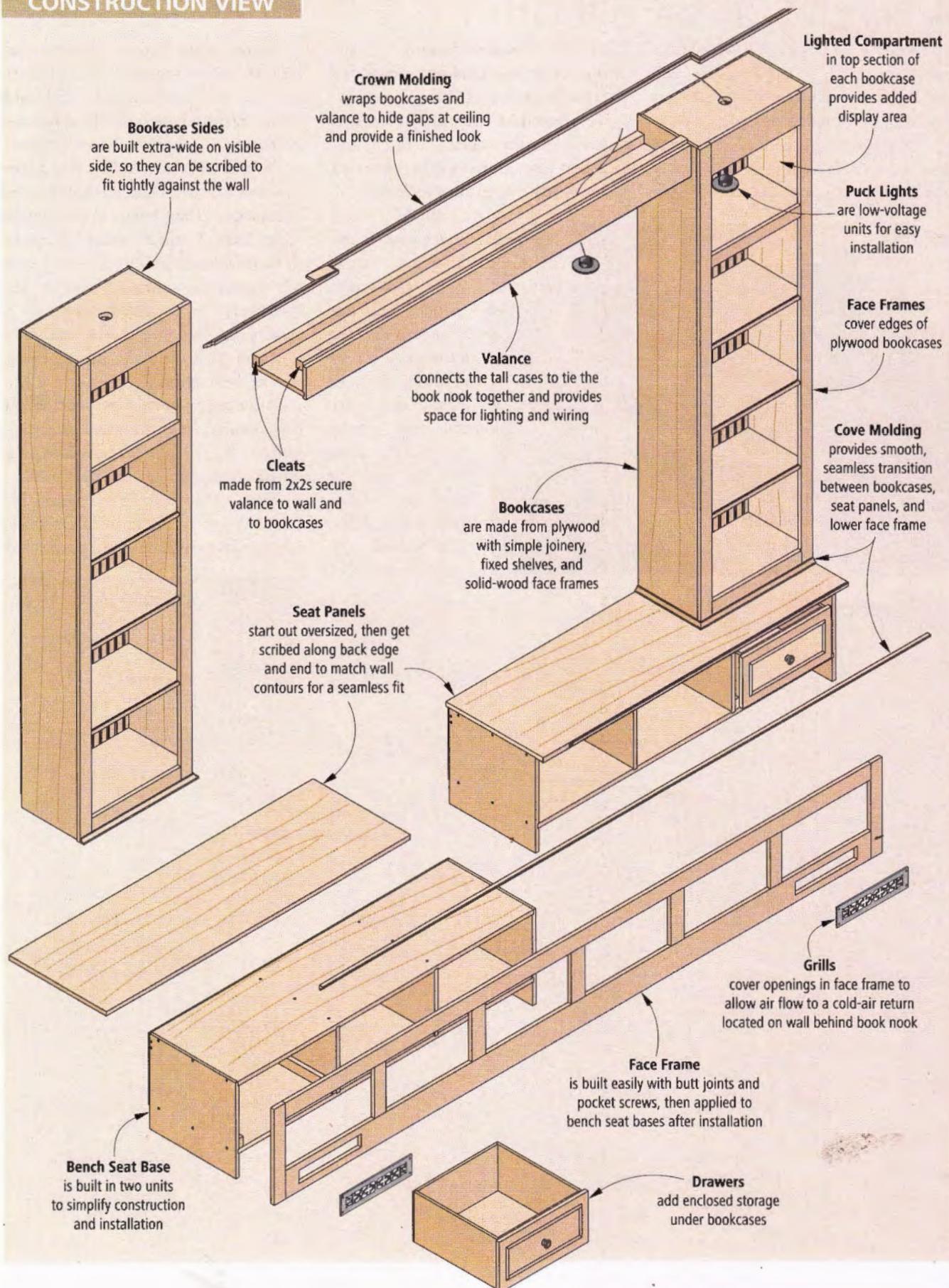
Build To Suit—Equally important with a built-in, though, is making the project *complement* the room. To do that, you need to pay close attention to the stylistic elements of the room (*Photo, left, and Illustration, below*).

In this room, the woodwork is painted, so we painted the project, as well. We echoed the room's beadboard panels by using the same material for the backs of the cases. Plus, we removed paneling behind the book nook to make sure it would look built *in*, not tacked *on*.

Results May Vary—This means you're likely to build your book nook differently than ours. The measurements will almost certainly be different (our wall was 11-feet, 3" wide and the ceiling, at 8-feet, 2", is higher than normal). You may want to alter the style, as well. In spite of the inevitable changes, however, this project will remain simple to build (*Construction View, right*).



CONSTRUCTION VIEW



A Bench Seat Starts It Off

The base for the book nook is the broad bench seat. With its ample seating and built-in storage drawers, the bench seat would make a great project on its own.

The seat starts off with two plywood base units (built separately to simplify installation) that are assembled with

dado and rabbet joints. A face frame encloses the front, and a plywood seat panel tops it off (*Base Assembly*, below).

To determine the length of each unit, measure the wall it will rest against, and then subtract an inch for clearance. Then divide this number in half.

Once you've determined how long to make each base unit, cut the base tops (A), ends (B), and dividers (C) to size from $\frac{3}{4}$ " plywood. Now, cut a notch in each divider. Later on, these notches will be used to hold a cleat (*Detail*, below) that secures each unit to the wall.

Dado for Secure Joints—It's time to lay out a series of dadoes in the base top and bottom, and a dado and rabbet in each base end. These features are shown in the *Base Assembly* below.

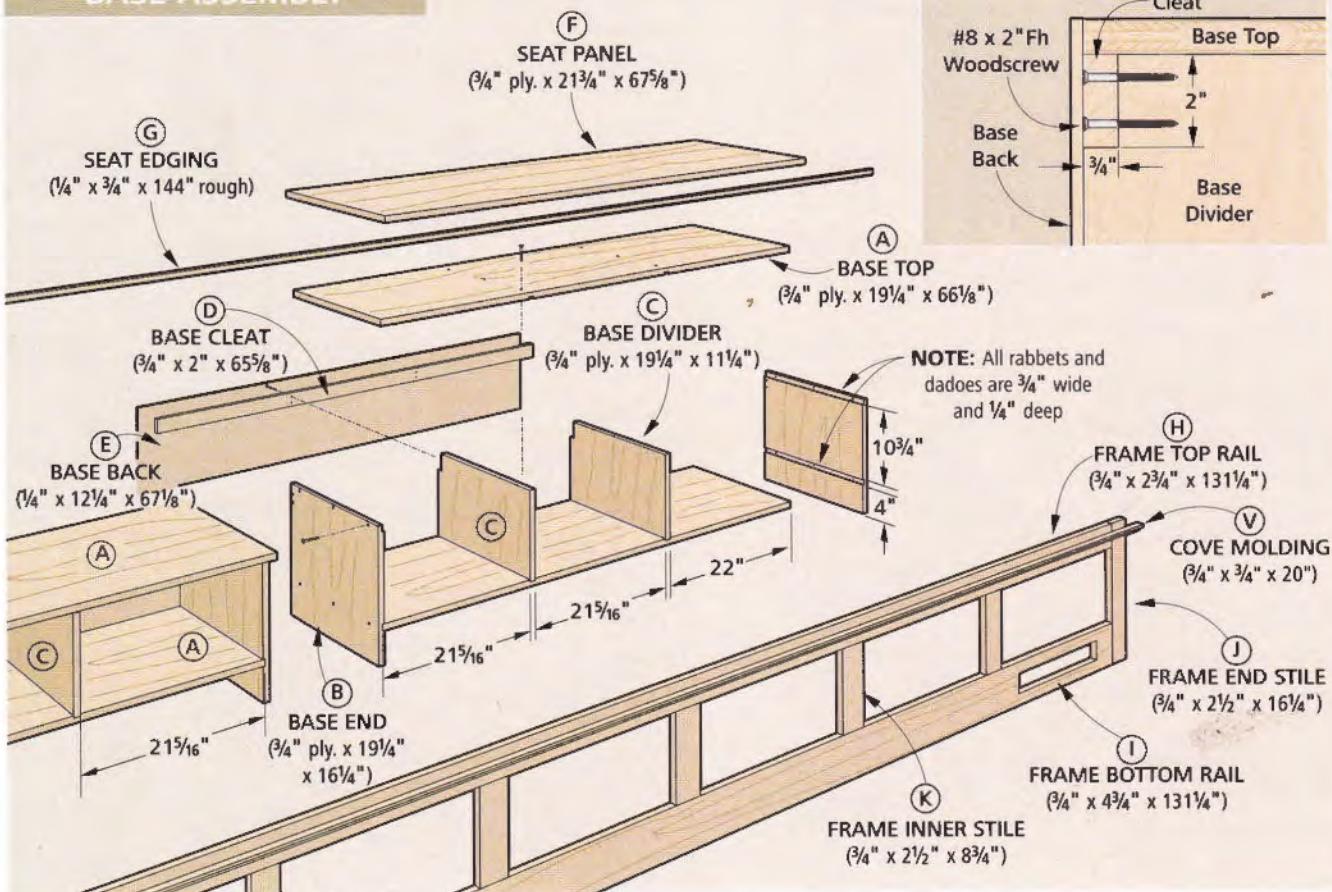
You'll notice the dadoes that house the dividers aren't spaced equally. This is because of the bookcases that will be added later. As the *Photo* at left shows, those bookcases sit directly on top of the outermost compartments in the bench seat. So I wanted the width of these outer openings in the seat to be identical with the width of the openings in the bookcases.

After laying out the position of the first divider dado, I located the dado for the other divider midway along the remaining length of each base unit.

With all the dado locations laid out, you can cut or rout the dadoes and rabbets. Then drill counterbored shank



BASE ASSEMBLY



MOLDING MADE EASY

holes for the screws that will hold each base together.

Next, you can assemble the bases. As you do this, be sure to orient the pieces correctly — with the wider compartments at the *outer* ends, and the notches in the dividers facing toward the *back*.

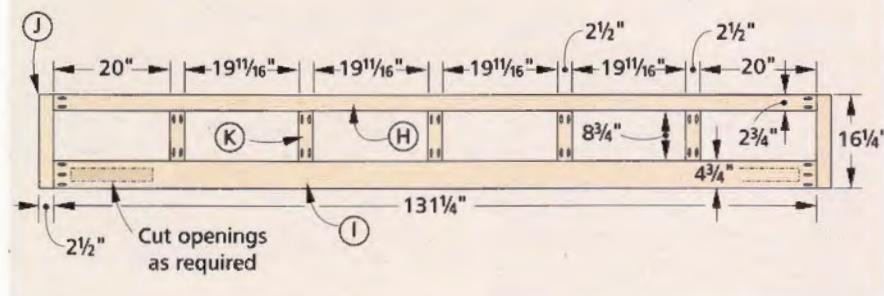
At this point, turn your attention to the backs of the base units. Add base cleats (D) first. Attach these by driving screws in from the base ends, as well as through the cleats into the dividers. Finally, cut back panels (E) to fit from $\frac{1}{4}$ " hardboard, and then secure each of these panels with 1" brads.

Seat Panels Top It Off — The base units are topped by a pair of plywood seat panels (F) made from $\frac{3}{4}$ " plywood. They start out $\frac{1}{2}$ " longer and $2\frac{1}{4}$ " wider than the assembled base unit that it sits on.

At the front, this overhang allows the seat panel to extend past the face frame and molding that get added when the bench seat is installed. At the back and outside edges, it gives an extra $\frac{1}{2}$ " so you can scribe the seat to match the walls. For now, cut the seat panels to these oversized dimensions, and then you can set them aside.

You can also make the seat edging strip (G) at this time. It's simply a length of $\frac{1}{4}$ "-thick solid stock that gets applied later to conceal the edge of the plywood seat panels. (I cut my edging strip from a single piece of 12-ft. long poplar.) The *Sidebar* at right shows an easy way to make this narrow edging strip safely.

FACE FRAME



Set the seat panel edging aside for now, too. It doesn't get applied until the book nook is installed.

Best Face Forward — The final element of the bench seat is a face frame that covers the front of both base units. This frame is made up of long rails connected by stiles that align with the dividers in the base units (*Face Frame, below*). When installed, these stiles will conceal the dividers.

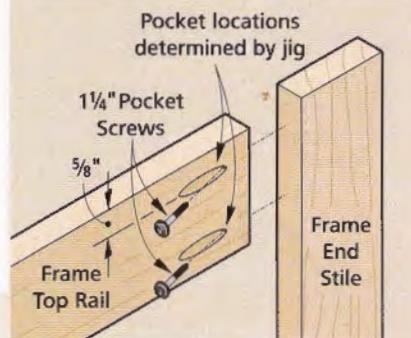
The face frame couldn't be simpler to build. Butt joints and pocket screws hold it together (*Pocket Screw Detail, below*).

Like the seat panels, the face frame is also built longer than the distance between the walls it spans — $\frac{1}{2}$ " in this case. The reason for oversizing remains the same here, too: You can scribe and trim the face frame to fit tightly against the walls on both ends.

After calculating how long to make your face frame, cut the top rail (H), bottom rail (I), end stiles (J), and middle stiles (K) to size.

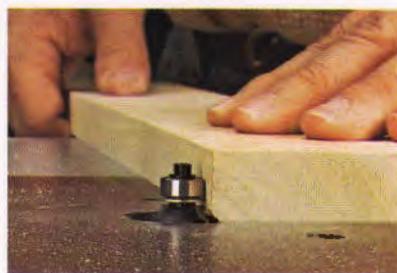
Now bore the pocket holes, align the pieces, and then glue and screw the face frame together. Set it aside until it's time for installation.

POCKET SCREW DETAIL



The edging for the long bench seat is just a $\frac{1}{4}$ " strip that's dressed up with rounded edges. But routing stock this thin can be tricky (and sometimes dangerous) because it places your hands very close to the spinning router bit. It's best to use a simple technique to make it a little easier.

Rather than trying to round over the edges of a thin strip, you'll get better results by rounding the edges of a wide board first. Then you can rip the $\frac{1}{4}$ "-thick edging free. It's a three-step process at the router table and table saw, as shown in the *Photos* below.



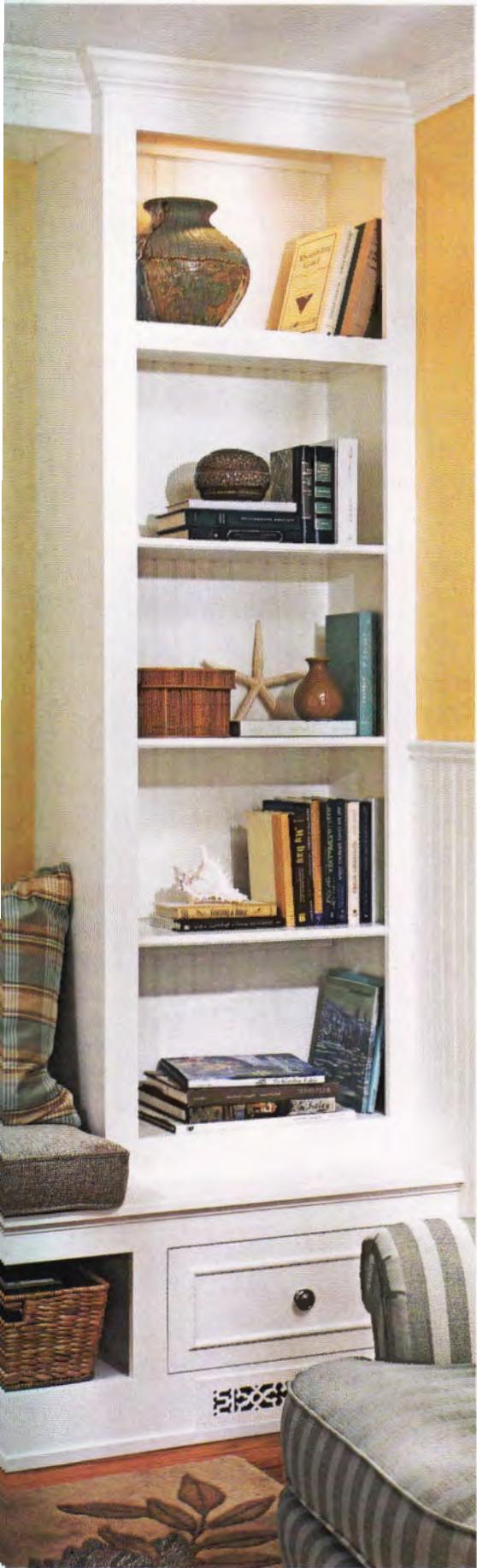
1] After ripping one edge of a long board straight, rout a $\frac{1}{8}$ " roundover along the edge.



2] Flip the board end-for-end, and round over the second edge using the same router-table setup.



3] To complete the seat edging, move to the table saw, and rip the rounded edge free of the board.



Bookcases Come Next

The bookcases are built almost like the base units. Each has a plywood case made of two sides connected by shelves that fit into dadoes. A face frame covers the front, and edging covers the shelves (*Case Assembly*, below).

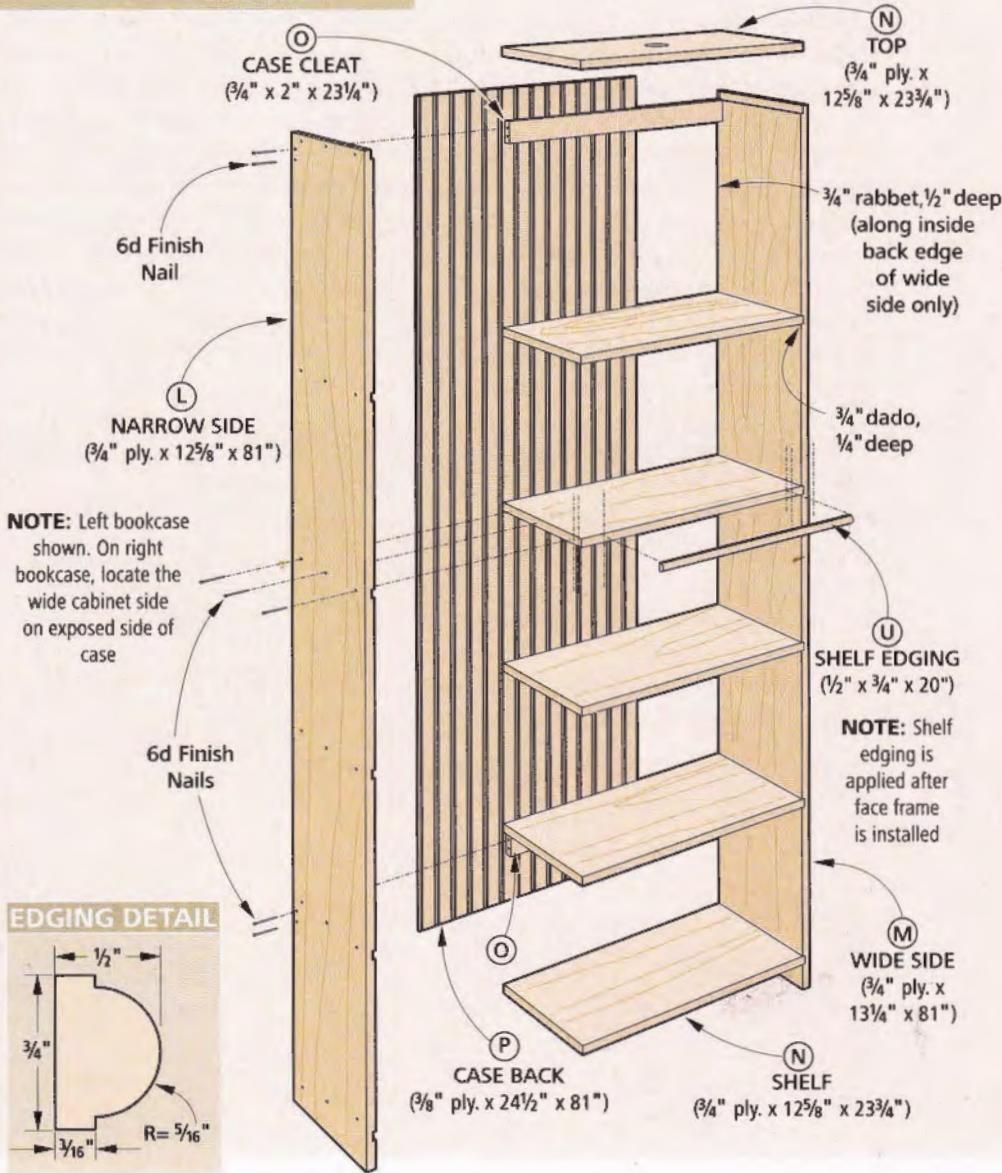
There is one notable distinction about the way the bookcases are built. Each has one side that's wider than the other, as shown in the *Case Parts View*, below right. You'll see why if you look at the *Photo* at left. One side of each cabinet is visible. That means it likely will need to be scribed to fit tightly against the back wall. To allow for this,

the side is extra-wide and extends beyond the back of the case (*Wide Side Rabbet Detail*). The other side of the cabinet is hidden. That means it doesn't have to be scribed or built extra-wide.

As you might have guessed by now, we also accounted for scribing with the face frames. Each is $\frac{1}{4}$ " wider than the case it attaches to. The overhang sits toward the outside of each case where it abuts the side wall of the room.

Building the Bookcases—You can now start the case construction. Rather than cutting all the sides at once, I started with two $26'' \times 81''$ blanks

CASE ASSEMBLY

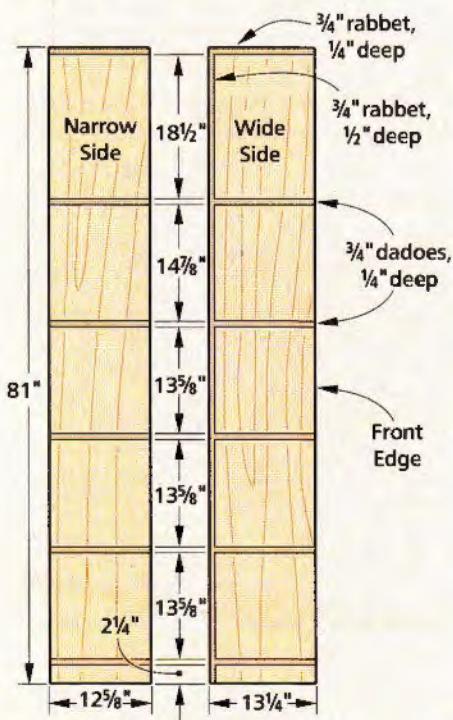


made from $\frac{3}{4}$ " plywood. Each blank is wide enough to produce one narrow side (L) and one wide side (M).

The next step is to cut five dadoes and a rabbet across each blank (*Case Parts View*). These receive the shelves, and cutting them across a wide blank ensures that, when assembled, the shelves in each case will align exactly.

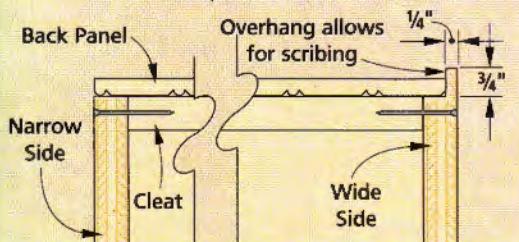
To cut the dadoes and rabbet, you can either use a table saw equipped with a dado blade, or a router and straight bit guided by a straightedge. That done, rip each blank to make a narrow side (L) that's $12\frac{5}{8}$ " wide, and a wider side (M) that measures $13\frac{1}{4}$ ".

CASE PARTS VIEW (Left Bookcase Sides Shown)



WIDE SIDE RABBIT DETAIL

NOTE: Top view of left bookcase shown.

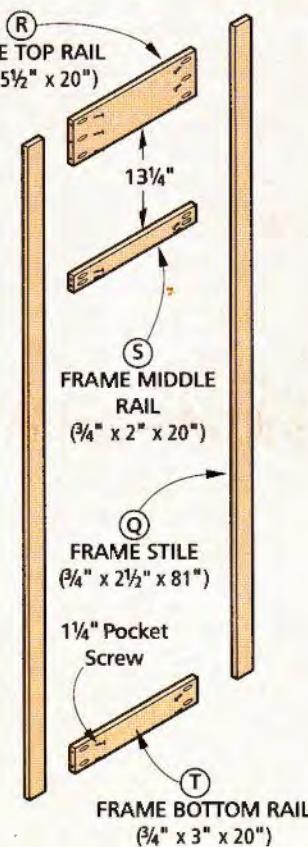


Run the Rabbets—Next, you need to lay out a rabbet along the back edge of each of the wide case sides. This rabbet serves two purposes: First, it decreases the amount of material you'll need to trim when scribing. Second, it provides a notch for the back panel to rest in (see the *Wide Side Rabbet Detail*, below).

As you lay out the rabbets, keep in mind that on the left-hand bookcase, the wide side will go on the *right*. On the right-hand bookcase, the wide side goes on the *left*. Mark each side so that you don't accidentally rabbet the wrong edge.

Bring on the Shelves—With the case sides complete, cut the shelves and tops (N) to size. In my bookcases, the upper compartment is a lighted display area. Before assembly, I bored a $2\frac{1}{8}$ " hole centered in the two tops for the puck lights to fit into.

FACE FRAME ASSEMBLY



Now the bookcases can be assembled. I attached the shelves using glue and 6d finish nails instead of screws, so that I didn't have large holes to fill in the visible sides before painting.

Next, you can cut two case cleats (O) for each case, and then nail them to the case sides. You'll drive screws through these cleats to secure the bookcases to the wall.

The case backs (P) are the next parts that get installed. To echo the look of the beadboard paneling in the room, I made the backs from $\frac{3}{8}$ "-thick beaded plywood. Then the backs get tacked on with 1" brads.

Fit the Face Frames—A solid-wood face frame comes next for each case (*Face Frame Assembly*, left). To make each face frame, cut the stiles (Q) and a top, middle, and bottom rail (R, S, T) to size from solid stock. Then assemble the frame with pocket screws.

Now glue and nail the face frames to the cases. Make sure that each face frame sits flush with the wide side of each case and overhangs the side which will sit against the wall.

Add Shelf Edging—What's left is to add edging (U) to the three shelves that aren't covered by the face frame. This edging features a beaded roundover profile (*Edging Detail*) made using the three-step technique that was used for the seat panel edging (Sidebar, page 47). Start with extra-long edging pieces, and then cut each to fit the shelves. Glue and nails hold the edging in place without clamps.

A Good Time to Paint—Most of the major construction is now complete for this project. Before you move on to the installation, though, I advise you to paint most of the parts. That way, you can take your time without making a mess where the book nook will be installed. I primed and painted everything but the seat panels. Those were left bare because fitting the bookcases means sliding them in and out of place a few times, which could scratch up the paint.



Screw the base units together, and make sure they're straight across the front. Then level the assembly using shims as needed.



Install the Bench Seat & Bookcases

Before you begin installing the book nook, you may need to do a little prep work in the room. For example, I removed the baseboard behind and beside the bench seat to ensure that I could tuck the back of the base units tightly against the wall.

At the same time, I stripped off the beadboard on the back wall where the project would go. To me, that made the book nook truly look built-in rather than tacked-on. This, of course, led to a bit of plaster repair.

Then I decided to go ahead and repaint the room. That way, it would fully match the book nook. These types of tasks are what I like to call "night-as-wells." They take time, but they really do give a built-in project a nice finishing touch.

Bring in the Bench Seat—Start installation by positioning the seat bases (*Base & Frame Installation*,

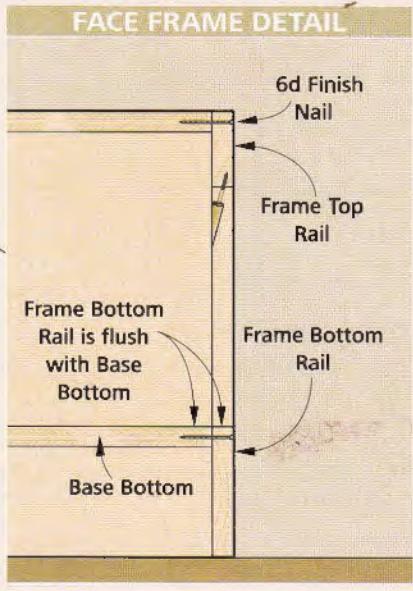
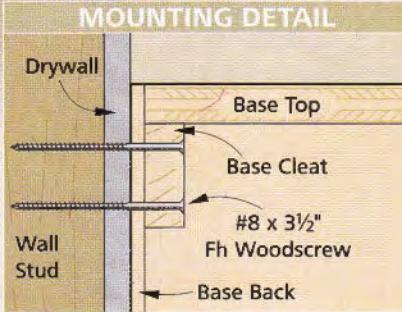
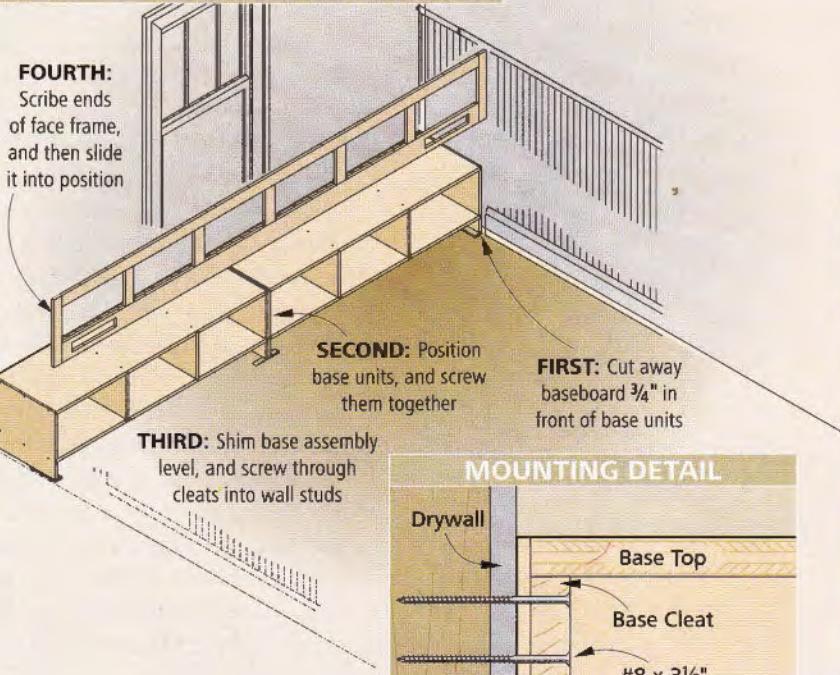
below). They should align without problem, but be sure to double-check that the tops are flush and that the front edge of the assembly is straight (*Photo, left*). With that done, you can level the base units (*Inset Photo, left*).

After leveling, shim between the back of the base units and wall if necessary, and then drive #10 × 3½" screws through the base cleat and into wall studs (*Mounting Detail*). Screw each base unit to at least two studs.

Get Framed—Before attaching the face frame, scribe and trim the end stiles to match the walls. Align the face frame, and secure it with 6d finish nails (*Face Frame Detail*).

Have a Seat—Next up are the seat panels (*Add Seat & Trim*). Position one panel so it overhangs the face frame consistently. Now scribe and trim the back edge and outer end of the panel. Remember that, once fitted, the panel should overhang the face frame by 1". Once this first panel fits, clamp it in place. Then fit the second panel the

BASE & FRAME INSTALLATION



same way (*Photo, below*). When both of your panels fit in place, nail the seat panels to the base units.

Slide In the Bookcases—Fitting the bookcases comes next (*Bookcases Top It Off, right*). Be prepared to test-fit them a couple of times so that you can get the best fit.

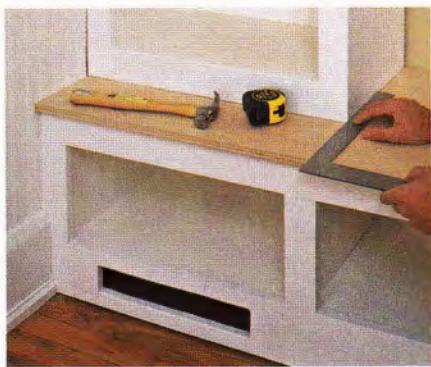
Start by making sure each case sits square on the bench seat (*Photo, bottom*). Then scribe the face frame where it butts against the wall, remove the case, and trim it to fit. Refit the case, and then scribe and trim the case side. Now install the bookcase (*Case Cleat Detail*).

Finally, glue and nail on the seat edging (*Seat Trim Detail*). A piece of $\frac{3}{4}$ " cove molding (V) goes below. More cove molding wraps around the bookcases (*Case Molding Detail*).

Once these parts are installed, now is a good time to paint them.



Each seat panel gets trimmed to fit the wall on the back and outside end. The panels should meet tightly at the center.



Use a framing square to make sure each tall case is positioned properly before scribing and installing it.

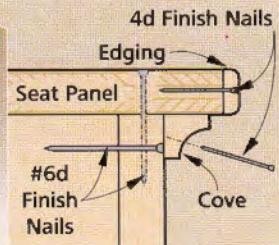
ADD SEAT & TRIM

SECOND:
Scribe and fit second seat panel, then nail both to base units

THIRD: Cut seat-panel edging and cove molding to length and nail them in place

FIRST: Scribe back edge and outside end of first seat panel to fit, then clamp in place

SEAT TRIM DETAIL



BOOKCASES TOP IT OFF

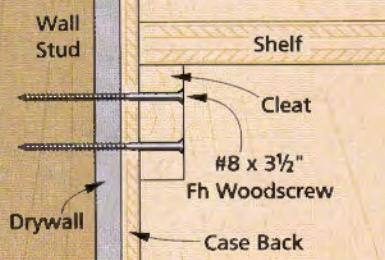
THIRD: Attach bookcases to wall by driving screws through case cleats and into studs

FIRST: Mark rough position of bookcase on paneling, then remove paneling that would be covered by case

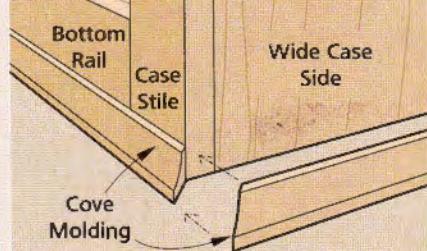
SECOND: Scribe and trim face frame and cabinet side to match wall contours

FOURTH: Miter cove molding to fit and attach to bookcases at base

CASE CLEAT DETAIL



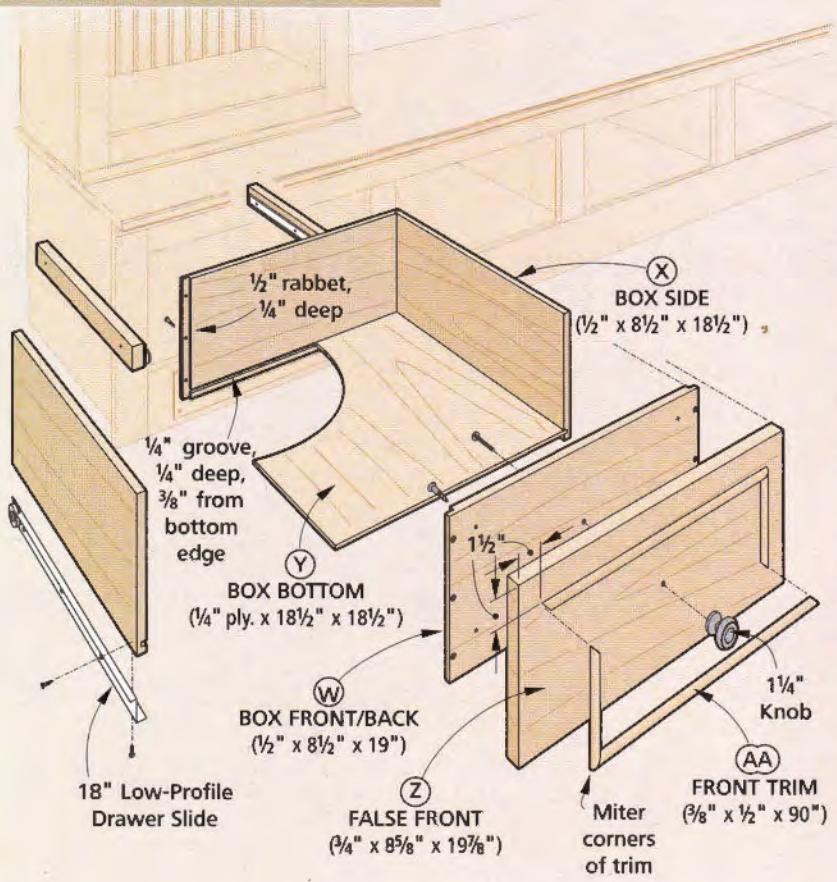
CASE MOLDING DETAIL





Deep drawers like these add a lot of enclosed storage for blankets, games, or just about anything you want to store in them. Like the rest of this project, they're easy to build using straightforward joinery techniques.

DRAWER ASSEMBLY



Add Drawers & A Valance

With the bench seat and bookcases installed, I decided to add enclosed storage to the project with a pair of drawers (*Photo, left*). You could choose to leave all the compartments open, or build even more drawers. It all depends on what suits your needs.

Each drawer is just a simple box covered by a false front with a decorative molding (*Drawer Assembly*).

Start by cutting the drawer fronts, backs (W), and sides (X) to size from $\frac{1}{2}$ " hardwood. Then rabbet the fronts and backs (*Drawer Joinery Detail*), and cut grooves for the plywood bottoms (Y) before assembling the boxes.

The false fronts (Z) come next. They're cut to size from $\frac{3}{4}$ "-thick poplar. Then you can add the drawer trim (AA). It's made using the techniques on page 49, mitered to length, and secured with glue and 1" brads.

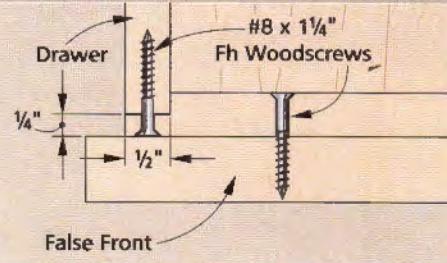
Add Spacers—Before you can install the drawer slides, you'll need to "build out" the bench seat compartments, so the slides fit flush with the edges of the face-frame stiles. Spacers (BB) accomplish this (*Drawer Slide Detail*). Plane or rip each spacer to thickness, and then mount it to the divider.

From there, you can install the drawer slides, and then slip the drawer boxes into position. Finally, align and mount the false fronts.

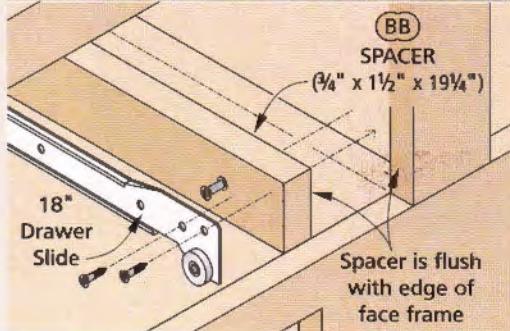
Top It Off with a Valance—The finishing touch is a valance. It spans between the bookcases to tie the project together and provides a place to mount lights and run wiring (*Valance Assembly*). Consisting of just two pieces, it's one of the easiest parts of this project to build.

Construction begins by cutting the valance bottom (CC) from $\frac{3}{4}$ " plywood. It starts out oversize. Next, bore holes for puck lights if you want to add lighting. The extra-long valance face (DD) comes next. It gets a full-length groove to receive the valance bottom and roundovers on the lower edge (*Valance Mounting Detail*). After making the valance parts, paint them, but don't assemble the parts just yet.

DRAWER JOINERY DETAIL



DRAWER SLIDE DETAIL



Cleats Hold the Valance—A pair of simple cleats (EE) secure the valance. After cutting them to length from 2x2s, screw one to the wall and the other to the bookcases (*Valance Mounting Detail*).

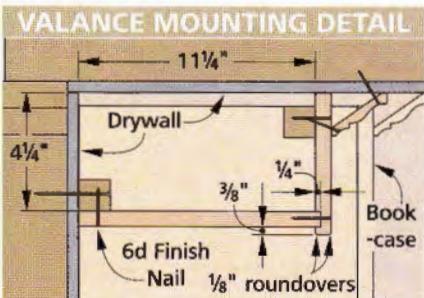
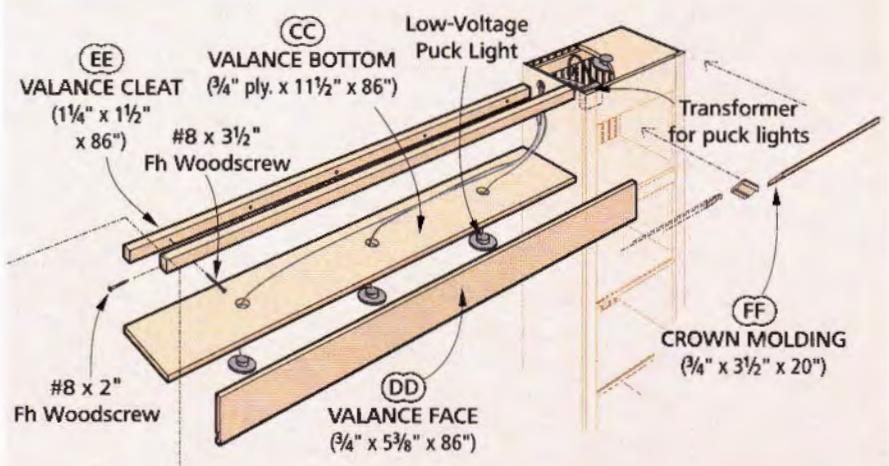
Next, check the fit of the valance bottom and face (*Photo, above right*). Scribe them if needed, nail them together, and then slip the assembly into place after routing all the wires into the case.

The Crown Touch—To hide any gaps around the ceiling, wrap the valance and the bookcases with crown molding (FF). It just gets mitered to fit, and then nailed in place.

With the book nook complete, it's time to kick back and relax—with a good book, of course. ■



VALANCE ASSEMBLY



MATERIAL LIST

Part	Qty	Size	Material
BENCH SEAT			
A TOPS/BOTTOMS	4	3/4" x 19 1/4" x 66 1/8"	Birch Plywood
B BASE ENDS	4	3/4" x 19 1/4" x 16 1/4"	Birch Plywood
C BASE DIVIDERS	4	3/4" x 19 1/4" x 11 1/4"	Birch Plywood
D BASE CLEATS	2	3/4" x 2" x 65 1/8"	Poplar
E BASE BACKS	2	1/4" x 12 1/4" x 67 1/8"	Hardboard
F SEAT PANELS	2	3/4" x 21 3/4" x 67 1/8"	Birch Plywood
G SEAT EDGING	1	1/4" x 3/4" x 144"	Poplar
H TOP RAIL	1	3/4" x 2 3/4" x 131 1/4"	Poplar
I BOTTOM RAIL	1	3/4" x 4 3/4" x 131 1/4"	Poplar
J END STILES	2	3/4" x 2 1/2" x 16 1/4"	Poplar
K INNER STILES	5	3/4" x 2 1/2" x 8 3/4"	Poplar
BOOKCASES			
L NARROW SIDES	2	3/4" x 12 1/8" x 81"	Birch Plywood
M WIDE SIDES	2	3/4" x 13 1/4" x 81"	Birch Plywood
N SHELVES/TOPS	12	3/4" x 12 1/8" x 23 3/4"	Birch Plywood
O CASE CLEATS	4	3/4" x 2" x 23 1/4"	Poplar
P CASE BACKS	2	3/8" x 24 1/2" x 81"	Beaded Plywood
Q FRAME STILES	4	3/4" x 2 1/2" x 81"	Poplar
R FRAME TOP RAILS	2	3/4" x 5 1/2" x 20"	Poplar
S MIDDLE RAILS	2	3/4" x 2" x 20"	Poplar
T BOTTOM RAILS	2	3/4" x 3" x 20"	Poplar
DRAWERS			
W FRONTS/BACKS	4	1/2" x 8 1/2" x 19"	Poplar
X SIDES	4	1/2" x 8 1/2" x 18 1/2"	Poplar
Y BOTTOMS	4	1/4" x 18 1/2" x 18 1/2"	Birch Plywood
Z FALSE FRONTS	2	3/4" x 8 1/8" x 19 1/8"	Poplar
AA FRONT TRIM	1	3/8" x 1/2" x 90"	Poplar
BB SPACERS	4	3/4" x 1 1/2" x 19 1/4"	Poplar
VALANCE/CROWN			
CC BOTTOM	1	3/4" x 11 1/2" x 86"	Birch Plywood
DD FACE	1	3/4" x 5 3/8" x 86"	Poplar
EE CLEATS	2	1 1/2" x 1 1/2" x 86"	Pine
FF MOLDING	1	3/4" x 3 1/2" x 20'	Pine

HARDWARE:

- (64) #8 x 2" Fh Woodscrews
- (66) #8 x 1 1/2" Pocket Screws
- (2 lbs.) 6d Finish Nails
- (1/2 lb.) 4d Finish Nails
- (1 lb.) 1" Wire Brads
- *(2) Pr. 18" Slides (#34850)
- *(2) Puck Light Sets (#39748: 2-Light; #39705: 3-Light)
- * Items available from Rockler.com; 800-279-4441

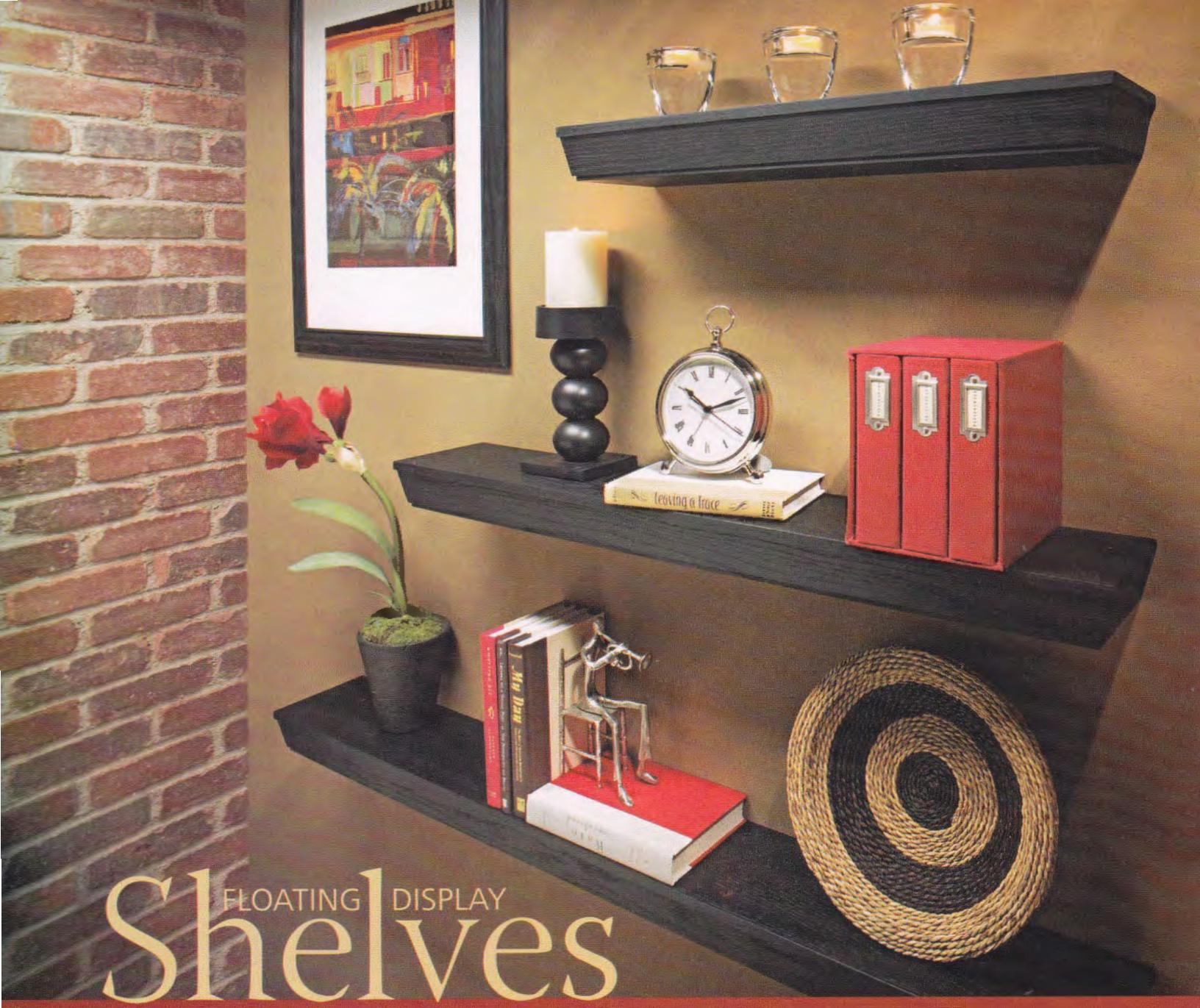
FLOATING DISPLAY Shelves

Add display space and a sophisticated look to any wall with this trio of easy-to-build wall shelves. To make a set, all you need is \$50, one day in the shop, and a table saw.

Take a look at the shelves shown in the *Photo* above, and you'll immediately notice the clean lines that make them look great, without detracting from the items they display. Look closer, and you'll appreciate how the wood grain shows through the satin-black finish. This is a subtle detail that adds a lot of style.

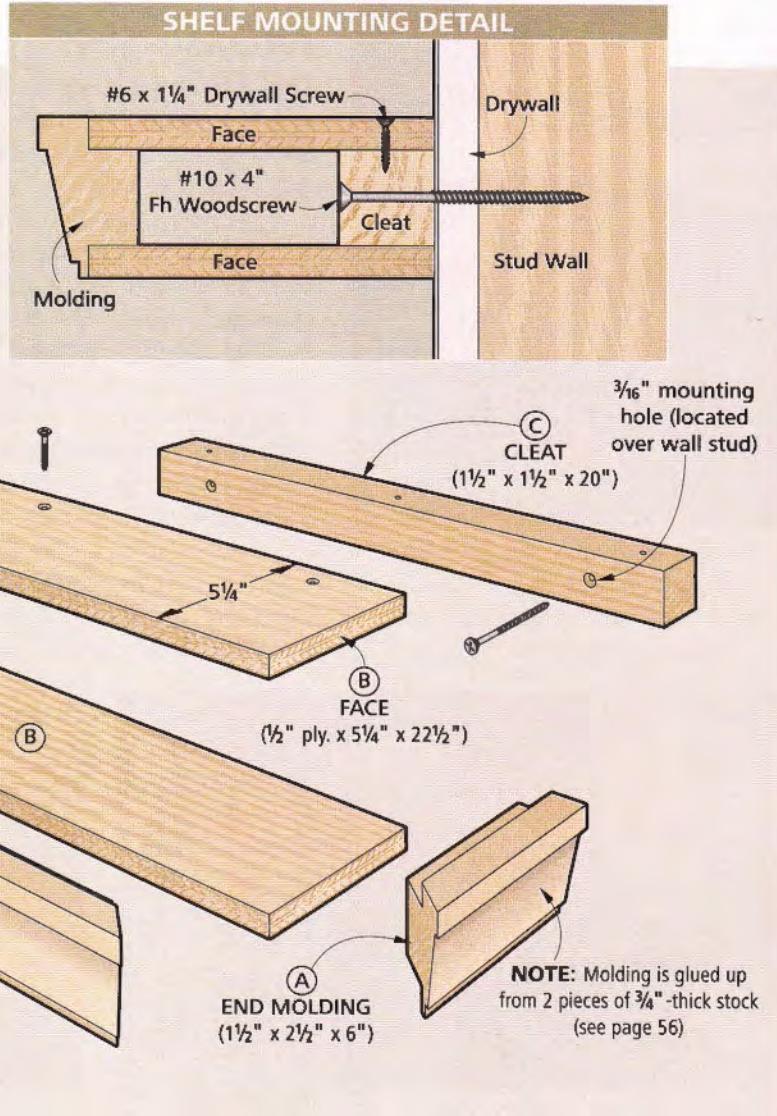
It's what you don't see, though, that makes these shelves truly unique. The shelves appear to just "float" on the wall with no brackets or other visible means of support.

The Inside Scoop—The secret to this illusion lies inside the shelves. As the *Construction View* at right shows, the shelves aren't made from thick slabs. Instead, they're hollow. The top and bottom face are made from $\frac{1}{2}$ " plywood, and shop-made molding wraps around the faces, leaving a hollow cavity in between. This system not only creates a clean look, but it also makes installation easy. Just mount a cleat to the wall studs, slip a shelf over it (*Photo*, right), and drive screws in from the top. It's simple, but incredibly sturdy.



CONSTRUCTION VIEW

NOTE: Dimensions shown are for the 2-ft. shelf. For the 3-ft. and 4-ft. versions, cut the faces (B) as follows:
 • 3-ft. shelf: (B) is $\frac{1}{2}$ " ply. x $5\frac{1}{4}$ " x $34\frac{1}{2}$ "
 • 4-ft. shelf: (B) is $\frac{1}{2}$ " ply. x $5\frac{1}{4}$ " x $46\frac{1}{2}$ "



Molding Made Easy—The molding that wraps around the shelves is simple to make, too. In fact, the only tool you need is a table saw.

Starting with one long piece of thick stock, you can create all the profiles with a handful of table saw cuts. After that, you simply miter the molding pieces to length and glue them to the plywood faces. It's so easy that I made *and* installed the three shelves shown here in just one day.

A Fine Finish Fast—To finish the shelves, I wanted a black “ebonized” look. This gave the shelves a classic, yet modern, look that matched well with the rest of the room. The look is often created using dyes, but

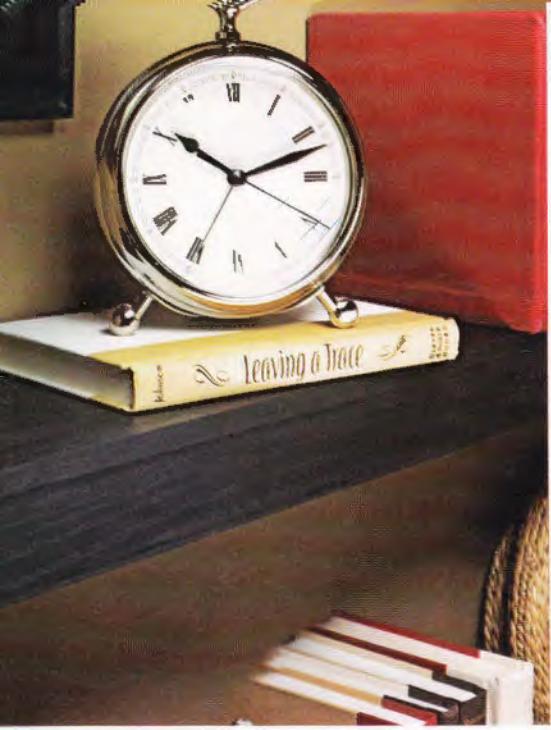
I didn't want that much hassle. So I made finishing these shelves the easiest part of the project by using black spray paint.

Any Size You Like—I made my shelves 6" wide. This narrow, wall-hugging design means that the shelves don't protrude too far into the room, but they still offer ample space for displaying small items.

When it came to the length of each shelf, I let the space where the shelves will hang dictate their length. My shelves measured 2-ft., 3-ft., and 4-ft. long. What was particularly nice about these lengths was that I could cut all the different-sized faces from a half-sheet of plywood.



The secret to these “floating” shelves is mounting cleats made from 2x2 scrap pieces that the shelves fit right over.



The satin-black finish is actually black spray paint. Applied in thin coats, the paint soaks into the pores and allows the wood grain to show through.

Molding & Miters

The great thing about building these shelves is the minimal amount of tools involved. For the next few steps, you'll only need your table saw.

To build the shelves, you should start by preparing stock for the molding (A). Each piece starts out as a $1\frac{1}{2}$ " x $2\frac{1}{2}$ " rectangular blank that is 2-ft. longer than the length of the shelf. That gives you enough to wrap around the ends of the shelf, plus extra in case you have to make several cuts to get tight-fitting miters. I also cut an additional short length of stock for my test cuts.

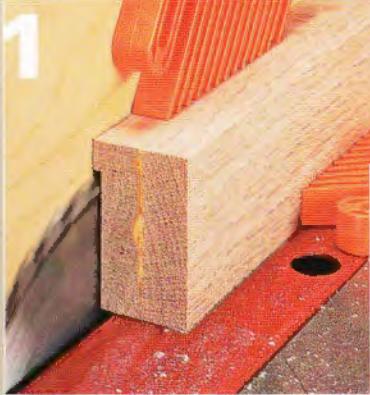
I used flatsawn red oak (hardwood and plywood) for my shelves. Even though I would be painting the boards later, I chose oak because

it has large, open pores that show up well after the paint is applied.

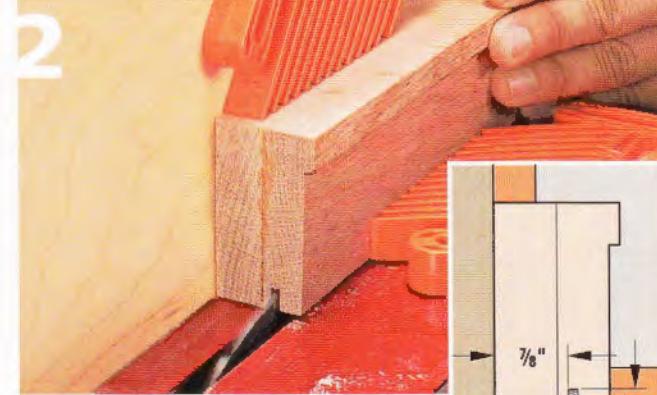
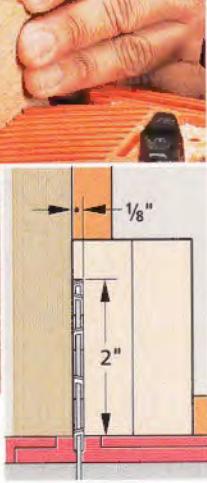
Thick Stock From Thin—To prepare stock that's thick enough for the molding pieces, you have two choices: You can either use $1\frac{1}{2}$ "-thick stock, or you can glue two $\frac{3}{4}$ "-thick pieces face-to-face like I did. Getting the edges perfectly aligned when gluing long pieces like this is a hassle, though. So I started with extra-wide pieces and trimmed them to width *after* gluing.

Four Steps to Success—Once you have each molding blank trimmed to thickness and width, you can cut the profiles. Though there are several profiles, including a wide bevel, the process is easy. To ensure consistent, accurate profiles, use

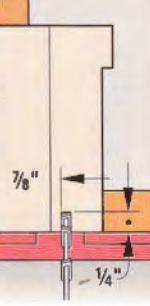
4 CUTS MAKE THE MOLDING



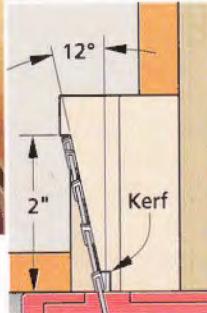
1] With the blade butted against an auxiliary face on the rip fence, cut a wide shallow rabbet in the blank.



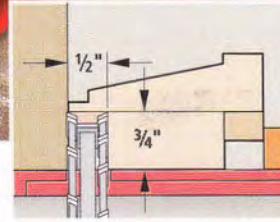
2] Reposition the fence, blade, and featherboard to guide the blank. Then cut a kerf in the blank.



3] With the blade tilted away from the fence, cut a bevel on the rabbeted face of the blank.



4] Install a $\frac{1}{2}$ " dado blade, and then cut the rabbets. Cut them in two passes to achieve full depth.



featherboards to keep the blank pressed firmly against the table saw fence.

The first cut to make is a wide rabbet. This is done by raising the blade high and making a single pass, as shown in *Step 1* on page 56. Don't worry if the saw blade leaves scoring marks on the wood. Those will eventually get trimmed off.

Next, you need to cut a kerf in the bottom edge of the molding blank as you can see in *Step 2* on page 56. This kerf will later become a subtle "step" at the base of the shelf.

Now cut the wide bevel, as shown in *Step 3*. Set the bevel angle of the blade at 12° , and then raise the blade 2" above the saw table. The blade should enter the workpiece alongside the kerf you just cut in *Step 2*, and exit at the top of the rabbet cut in *Step 1*.

After cutting the bevel, be sure to sand any saw blade marks smooth using a flat sanding block.

With that done, you can complete the molding by cutting the two large rabbets that the plywood faces will fit into. This is done with a dado blade, as shown in *Step 4*. When cutting, the back face of the molding rides against the saw table to keep the piece from rocking. It's a good idea to cut the rabbets in two passes. First, raise the blade $\frac{1}{2}$ ", and make a pass along each edge of



the blank. Then raise the blade to $\frac{3}{4}$ ", and complete the rabbets.

Faces—Now cut the plywood faces (B) to size for each shelf. The face dimensions for each shelf length are noted in the *Construction View*.

Tighter Miters—All that's left to do is to miter the molding pieces to length. Your goal should be to get the tightest-fitting miters possible. The best way to do this is to start at one end and work your way around, fitting one corner at a time (*see Illustrations below*). Once both mitered corners fit tightly, you can glue up the shelves. If you don't have enough clamps, secure the molding to the faces with a few small finish nails. Fill the holes with wood filler, and they'll never show after the shelf is painted.

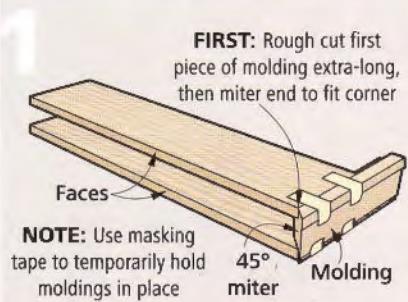
On to the Finish—This entire project is pretty easy to build, but the finish is downright simple. Just spray the shelves with a few light coats of flat black spray paint. Then you can rub

A long miter-gauge extension fence holds the molding as you miter each piece to length. Position the molding with its top edge against the saw table for a stable cut.

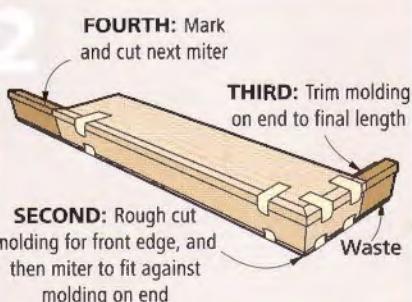
them with a paper towel to expose the wood grain. This will give the shelves the finished look that you see on page 56.

Set Your Shelves Afloat—In order to mount the shelves, start by cutting the cleats (C) to length from 2x2s. Then you can mount them to the wall, making sure all the cleats are level. You should use two screws in the 2-ft. cleat, and three or four screws in the longer cleats. You'll want to make sure at least one mounting screw will hit a wall stud for the 2-ft. shelf, and two in the longer shelves. If you have problems hitting a stud with the other screws, use wall anchors. Then to finish, slip the shelves on, and attach them with black trim-head or drywall screws (*Shelf Mounting Detail*, page 55).

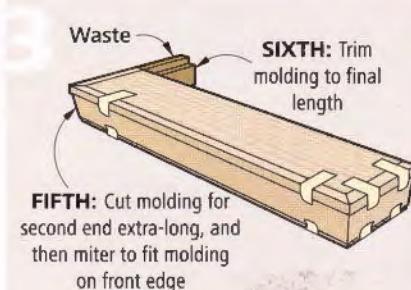
3-STEP MITERED CORNERS



1] Cut the first molding piece a few inches longer than the side. Then, go ahead and miter one end.



2] Now cut the front molding piece to rough length, and miter the first end. Then mark and miter the other end.



3] After trimming the final molding piece to fit, glue and clamp (or nail) all the molding in place.





LAUNDRY CENTER makeover

Easy-to-assemble melamine storage cabinets house five handy accessories that make your laundry room more useful and better organized—and make laundry less of a chore.

Comfortable. Cozy. Inviting. These words describe many rooms in the home, but they rarely get mentioned in reference to the lowly laundry room.

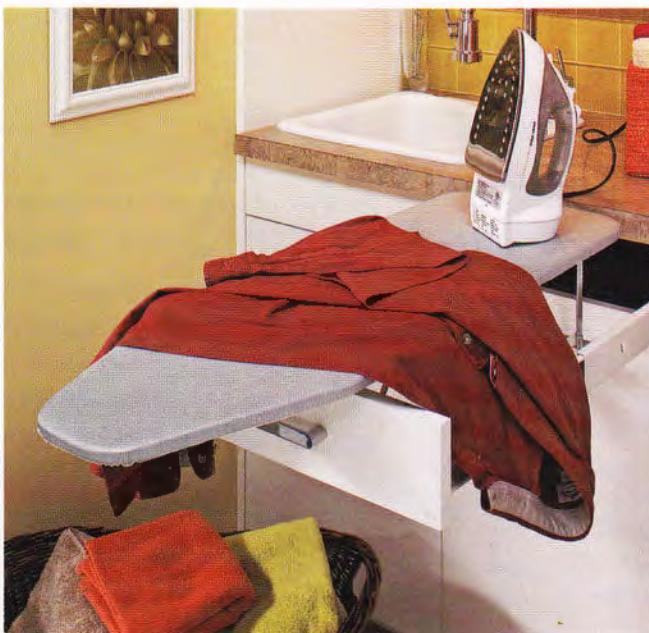
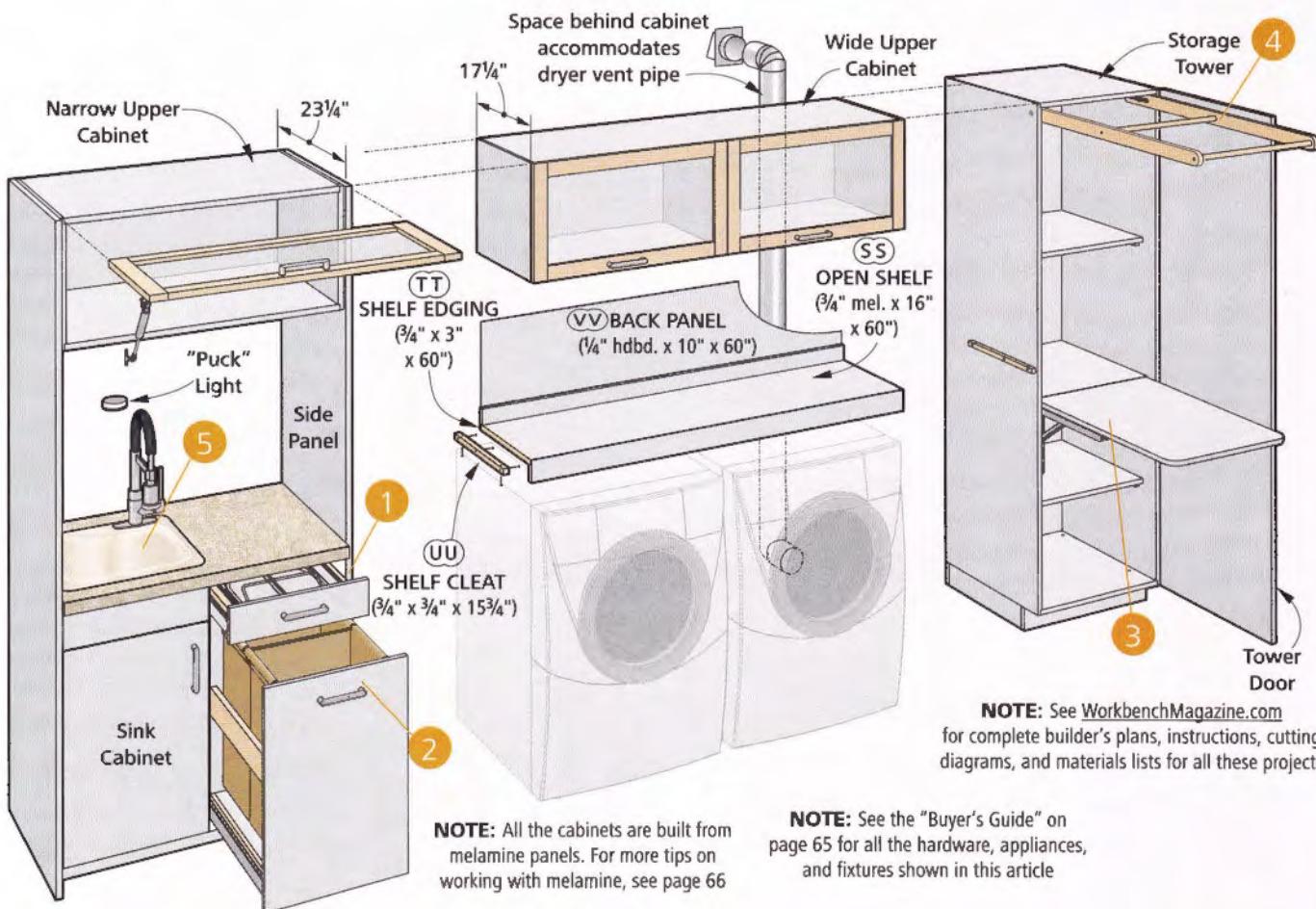
When you consider how much time you spend in the laundry room, though, shouldn't it be more than just a utilitarian space? Shouldn't it be, dare we say it, *comfortable* as well?

We designed this laundry system with exactly that in mind. As comfortable as it is, though, that cheery exterior hides a massive amount of built-in storage and other organizational features.

It all starts with the storage cabinets that surround the washer and dryer—a large tower on one side, a lower cabinet with a counter on the other side, and cabinets with flip-up doors above. Inside these cabinets, you'll find five handy accessories that make doing the laundry a breeze.

We'll highlight some of the unique features of this system on the following pages. Also, check out WorkbenchMagazine.com for complete plans, cutting diagrams, and material lists for building this laundry center.

5 GREAT LAUNDRY ROOM ADD-ONS



FOLD-OUT IRONING BOARD

1 This ironing board from Rev-A-Shelf pulls out from the cabinet and swings up for use. A "drawer" front conceals the board.



BUILT-IN CLOTHES HAMPER

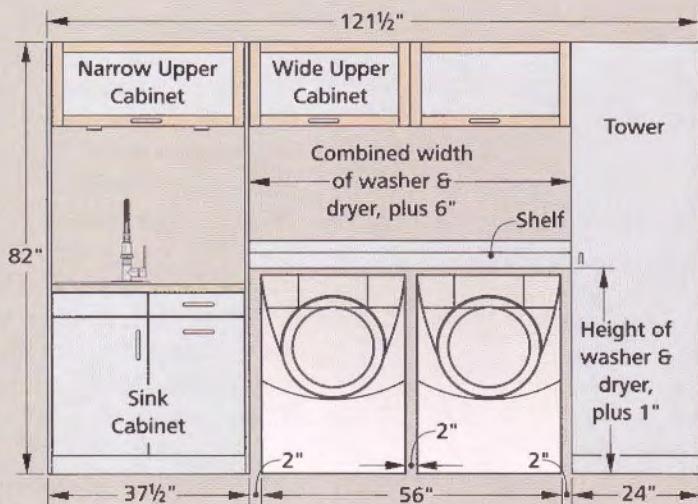
2 Fabric sorting bags suspended on dowels make a handy clothes hamper that pulls out from the cabinet.

SURROUNDED BY STORAGE

One of the keys to an efficient laundry center is having everything you need on hand. Here, we help you accomplish that by surrounding the washer and dryer with useful storage on all sides.

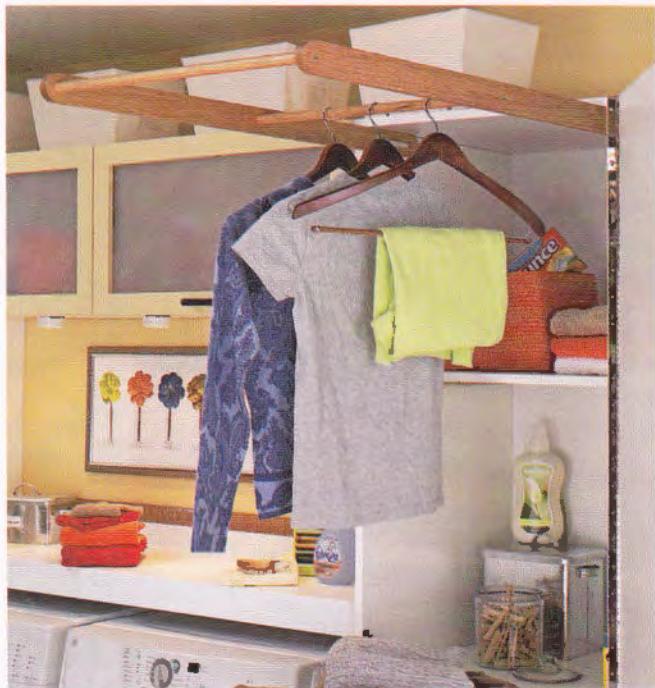
The size of these components, of course, will depend on the size of your washer and dryer, as well as the size of the room. Our laundry center ended up a little over 10-ft. long overall. If that works for you, all the dimensions for this center are presented on the following pages. Or refer to the *Illustration* at right to see how to modify the center to fit your space.

These projects work just as well as stand-alone projects as they do in a set. So feel free to build as many of the cabinets as your storage needs require.



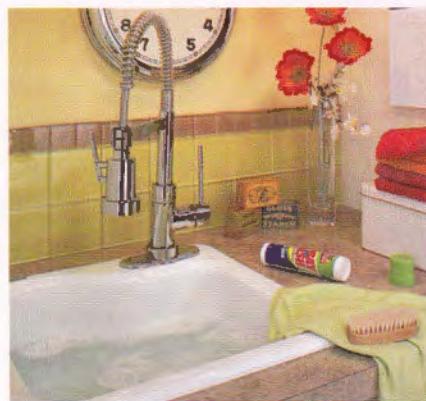
FLIP-UP WORK TABLE

3 To fold clothes, flip up this convenient work table. When you're done, the table stows out of the way inside the tower.



SWING-OUT HANGING RACK

4 This rack swings out and "locks" in place for hanging clothes to dry. Like the table, it tucks inside the tower for storage.



UTILITY SINK & FAUCET

5 A small utility sink and a flexible sprayer faucet mounted above one of the cabinets make quick work of removing stubborn spots and stains.



A TOWERING AMOUNT OF STORAGE

With three large shelves, this storage tower is a great way to clear the clutter in a typical laundry room. Inside the tower are two additional features that will come in handy: a flip-up work table and a drying rack (*Photo, left*).

Tower Construction—We wanted the tower's construction to be as simple as possible (*Building the Tower, right*). At the same time, it had to be sturdy enough to last. To that end, the tall tower sides (A) have rabbets in the ends that hold the top and bottom panels (B). Another rabbet in the back edge of each side accepts the back panel (C). (You'll find an article on cutting rabbets at WorkbenchMagazine.com.)

The tower sides, top, and bottom are assembled with glue and screws. The next part that's added to the case is a mounting cleat (D) that gets installed between the case sides with pocket screws. Later on, this cleat is used to anchor the tower to the wall.

After attaching the cleat, paint the front face of the back panel white to match the rest of the tower. Then attach it with glue and screws.

At this point, you can add the three storage shelves (E, F). Later on, the work table will be positioned at the same height as the middle shelf. Note that this middle shelf is also longer than the top and bottom shelves, so the work table can extend out further from the tower.

Each shelf gets screwed to a pair of shelf supports (G, H) attached to the case sides. Note that the middle shelf supports are shorter than the others. Later on, this will help you mount the work table easily. Now is also a good time to apply iron-on edgebanding to the tower parts.

Add a Base—The tower sits on a base that elevates the cabinet. This keeps it off the potentially damp

In addition to 30 cubic feet of storage, the tower has a rack for drying clothes and a table for folding and stacking them.

laundry room floor. The base has levelers that provide an easy way to level the cabinet on uneven floors.

The base is made up of four pieces (I, J) of $\frac{3}{4}$ "-thick stock that get cut to size and painted white to match the tower. The parts are joined with pocket screws. Another set of pocket holes drilled near the top edges of all the base parts let you attach the base to the tower from below. Once the base is attached to the cabinet, drilling holes above each leveler in the tower bottom allows you to insert a screwdriver and adjust the levelers (*Base Detail, below right*).

Put on the Door—The tower is enclosed with a door (K), which is a large melamine panel sized to overlay the front edges of the tower. After cutting it to size and applying the edgebanding, hinge the door to the tower.

Work Table—One unique feature of this tower is the flip-up work table (L). It's a melamine panel that's cut to fit between the tower sides. The table is supported by a pair of folding L-brackets.

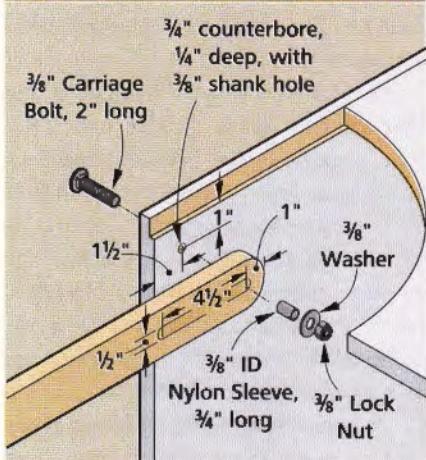
The L-brackets are attached to a pair of mounting blocks (M). These blocks are cut from a 2x4 and screwed in place below the middle shelf. After that, just attach the L-brackets to the cleats, and then screw the table-to-the brackets (*Work Table Detail, right*).

Drying Rack—At the top of the tower is the drying rack. It consists of two hardwood arms (N) with dowel rails (O) between them to create a place to hang clothes. A slot at the end of each arm accepts a bolt that connects the rack to the tower. If you swing the rack up and push it in toward the cabinet, the slot allows you to slide the arm back and "lock" it in place.

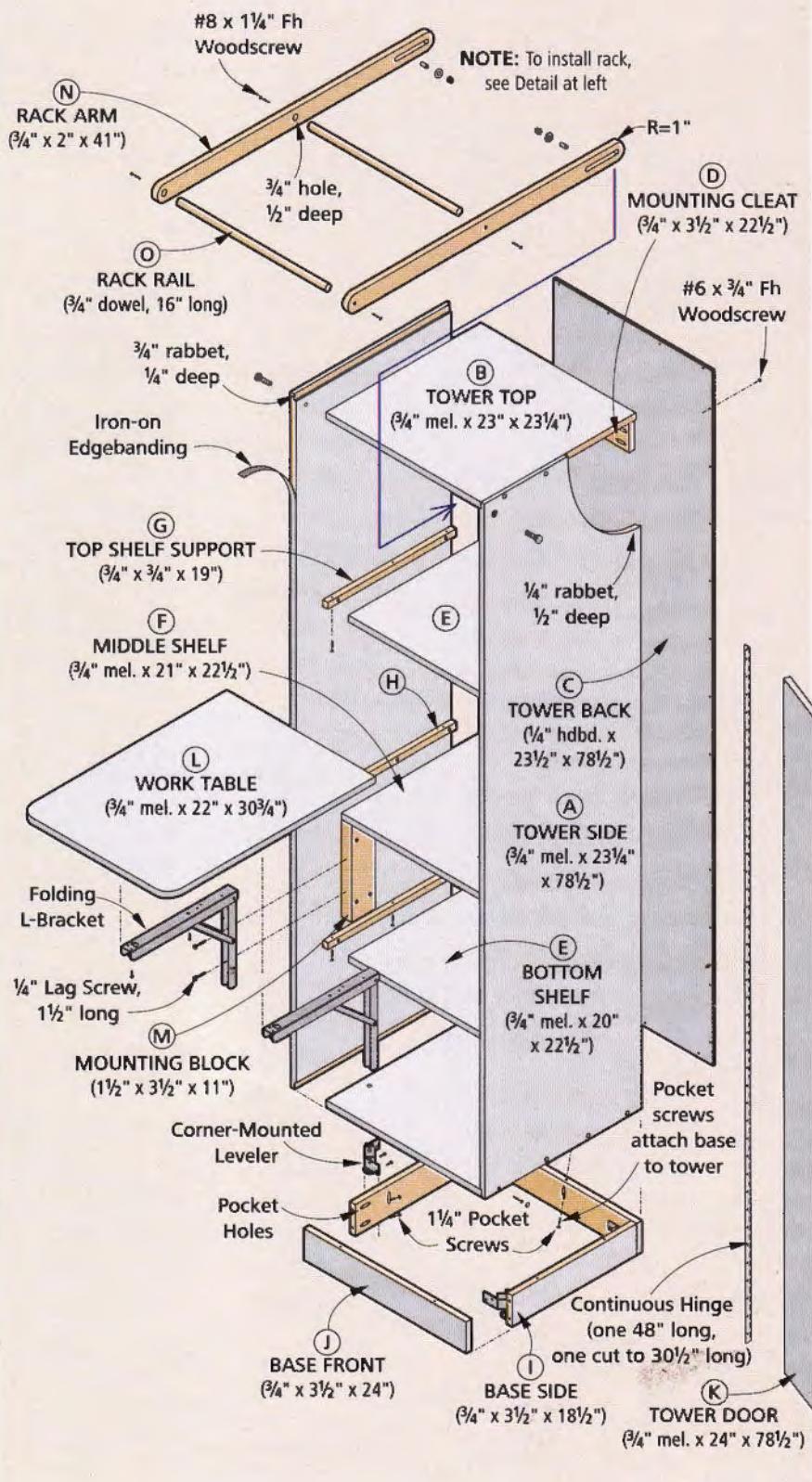
The rounded ends of the arms are easy to cut with a jig saw. Even the slots are simple: Just drill holes at each end, and cut between them with a jig saw. Then all that's left is to drill holes in the arms to accept the rails, which get installed with glue and screws.

To attach the rack, first drill holes in the tower sides for carriage bolts to pass through. Next, a nylon sleeve gets inserted in the slot in each hardwood arm to protect it from the bolt threads. The bolt then passes through this sleeve and gets secured with a washer and a lock nut on the inside of the tower (see the *Rack Installation Detail*, below).

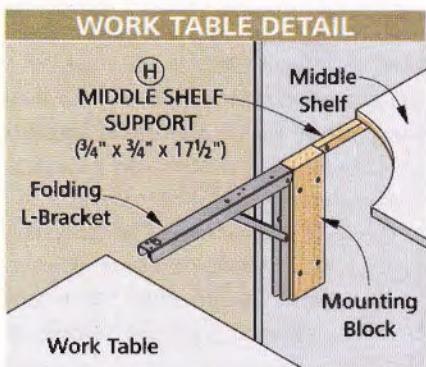
RACK INSTALLATION DETAIL



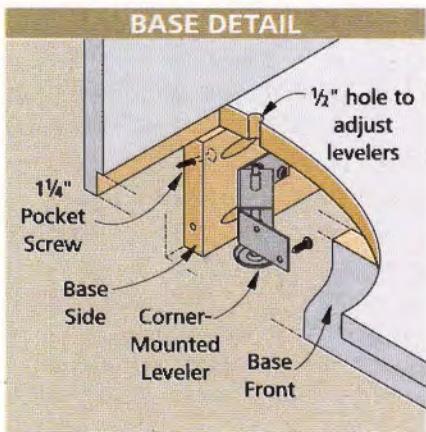
BUILDING THE TOWER



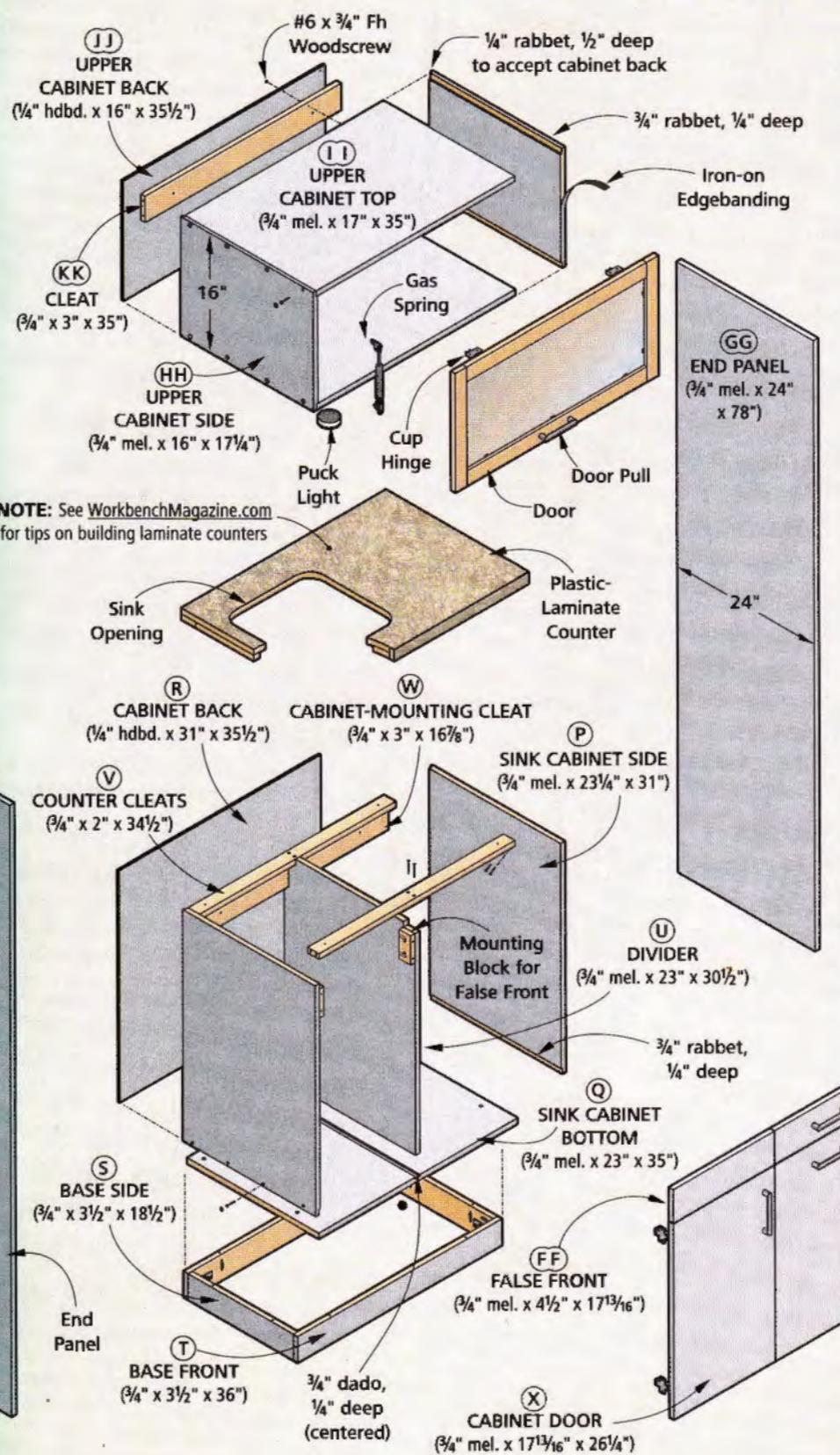
WORK TABLE DETAIL



BASE DETAIL



SINK CABINET



SINK & UPPER CABINETS

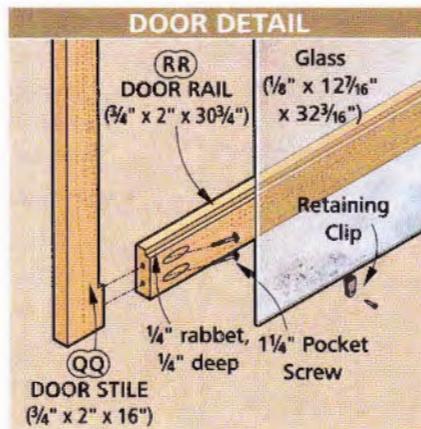
This laundry center's other storage cabinets, a lower sink cabinet and two upper cabinets, are built similarly to the tower shown on page 62. In addition to more storage, they provide room to add a fold-out ironing board, a pull-out laundry bin, and a utility sink.

Sink Cabinet—Like the storage tower, the sink cabinet is a basic melamine box. It features sides (P) that are rabbeted to accept a bottom (Q) and back panel (R). It also sits on a base (S, T) similar to the one on the storage tower.

One difference you'll notice is that this cabinet has a divider panel (U) that separates the cabinet into two compartments: One compartment that accommodates the plumbing for the sink, and a second for the ironing board and laundry bin. As a result, you'll need to cut a dado in the cabinet bottom with a router to accept this divider panel.

Another thing that's different about this cabinet is that it doesn't have a top. Instead, it has a couple of cleats (V) that are used to attach a plastic laminate countertop. You'll need to notch the top of this divider panel to accept these cleats. Then, the cleats just get pocket-screwed to the side panels, as shown at left.

Sink & Counter—The cabinet is topped by a plastic laminate counter and a utility sink. To make your own laminate counter, see the article at WorkbenchMagazine.com.



Laundry Bin—One of this center's most useful features is the pull-out laundry bin. This bin is a three-sided box with dowels at the top for hanging laundry bags. It slides in and out of the cabinet on a pair of full-extension drawer slides (*see the Laundry Bin Illustration, below*).

Ironing Board—The easiest accessory to add to the laundry center is the flip-up ironing board (*shown on page 60*). That's because the board, drawer slides, and hardware come in one handy kit. All you have to add is a false drawer front (FF), which is cut to size from melamine.

Upper Cabinets—The final elements of this laundry center are the upper cabinets. There are two cabinets in our setup: a narrow cabinet that's mounted above the sink between two tall melamine end panels (GG) (*Illustration, left*), and a double-wide cabinet that mounts above the washer and dryer (*Illustration, page 60*). Like the other cabinets, these are just rabbeted boxes.

The two upper cabinets are quite similar, but you'll notice that the wider cabinet has an added middle divider to separate it into two compartments. This requires cutting dadoes in the top and bottom panels to accept this divider.

Also, the wide upper cabinet isn't as deep as the narrow one. As you'll see on page 60, this allows you to mount the cabinet with a gap behind it in case you have water pipes, wiring, or a dryer vent running up the wall behind your washer and dryer.

The upper cabinets feature frosted glass-paneled doors that hide their contents from view. These doors are made with hardwood rails and stiles that are joined together with pocket screws (*see the Door Detail on page 64*). To accept the glass panels, you'll need to rout a rabbet around the frame openings. Once the doors are assembled, you can install them with hinges. Adding gas springs allows the doors to open and close easily, and lock securely in place when open.

BUYER'S GUIDE

WASHER & DRYER

Whirlpool Duet Washer and Dryer

866.698.2538

Whirlpool.com

(Supplied by O'Callaghan's - 515.276.3232)

SINK & FAUCET

American Standard Silhouette Sink

800.442.1902

AmericanStandard-US.com

Pegasus Side-Action Faucet/Sprayer

800.553.3199

HomeDepot.com

IRONING BOARD

Rev-A-Shelf Fold-Out Ironing Board

502.499.5835

Rev-A-Shelf.com

LAUNDRY BAGS

(2) Laundry Bags for Bagger Org. System

877.631.2922

Skyburst.com

PROJECT HARDWARE

(8) 26mm Blum Clip-on Hinges (#38411)

(6) Lift-O-Mat Gas Springs (#34373)

Folding L-Brackets (#58377)

White Surface-Mount Puck Lights (#25315)

22" Full-Extension Drawer Slides (#30230)

800.279.4441

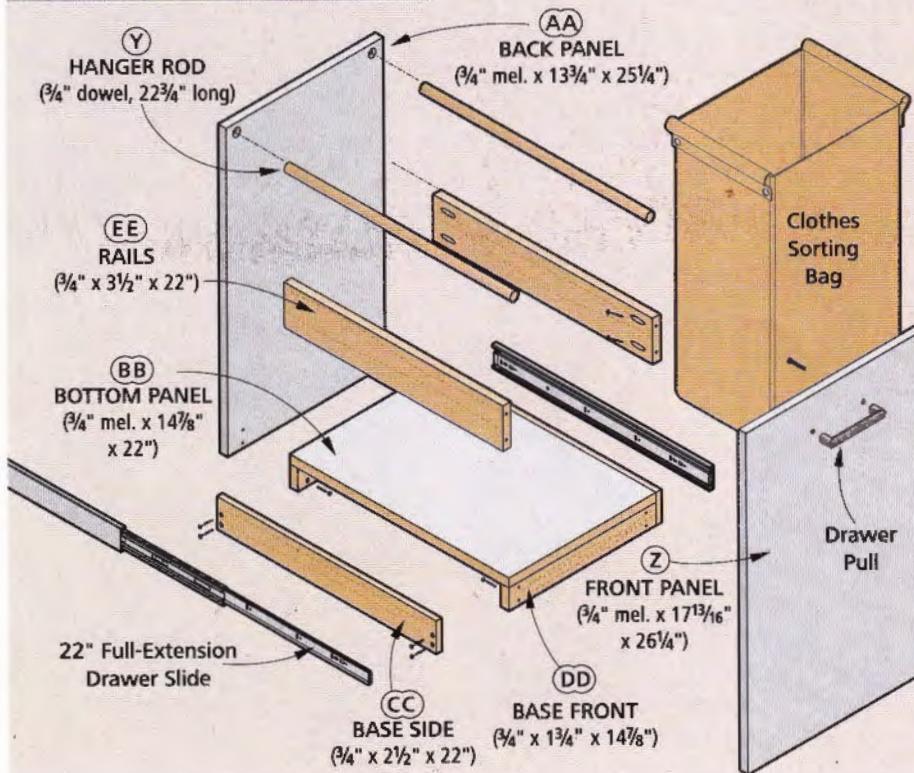
Rockler.com

(7) 5" Polished Chrome Handles (BBK-03592)

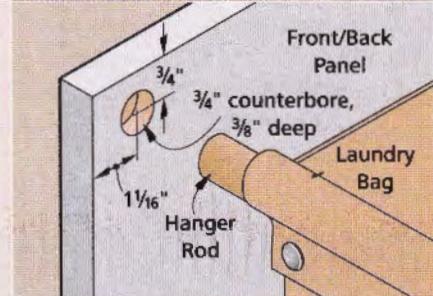
866.695.6627

MyKnobs.com

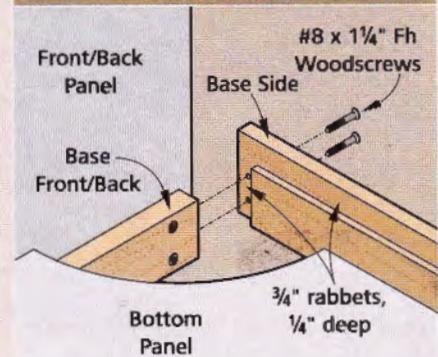
LAUNDRY BIN



ROD INSTALLATION DETAIL



BASE DETAIL



4 Tips for Cutting Melamine

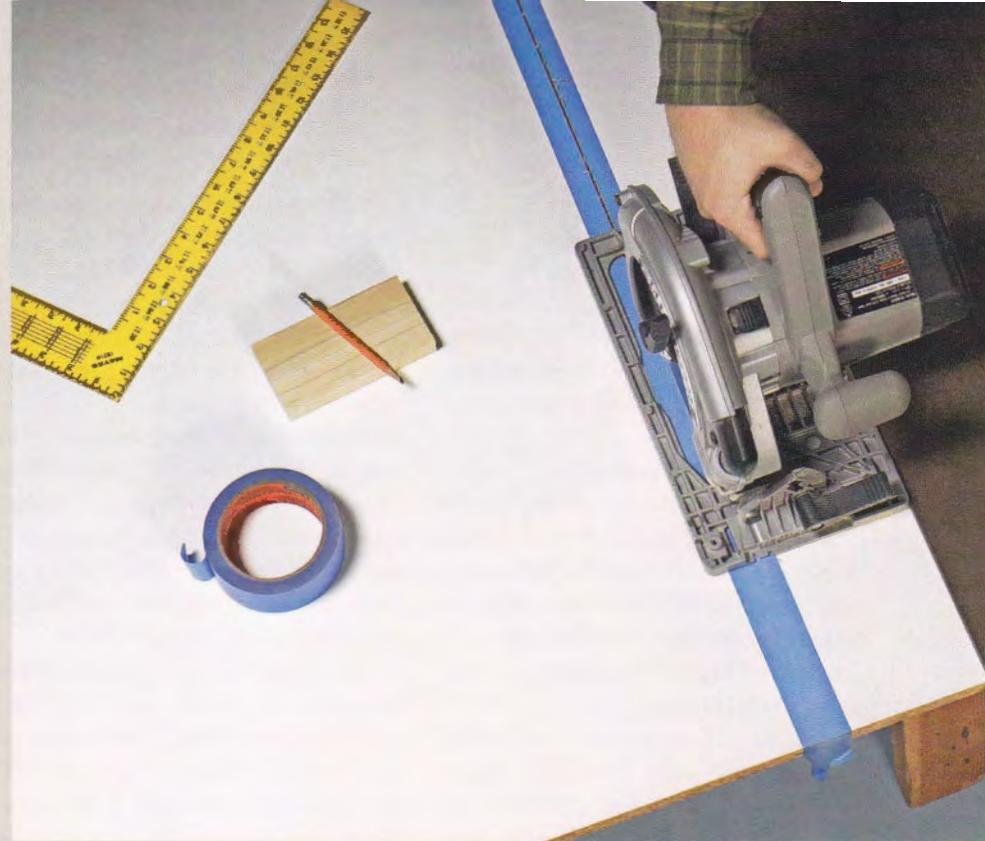
Melamine is a great material for this laundry room makeover for a number of reasons: It's inexpensive, durable, requires no paint or finish, and is readily available at any home center. Melamine is also easy to work with, but it requires some specific techniques in order to get clean, smooth cuts. These tips will help with that.

Forget the Table Saw—Despite its many advantages, melamine sheets weigh about 90 pounds, so cutting them on a table saw by yourself is difficult. A better option is to break down the sheets with a circular saw (*Photo, right*). A pair of sawhorses will position the sheet at a comfortable height.

Smoother Cuts—Melamine also has a tendency to chip along the cutline. Luckily, there are two easy ways to prevent this. One is to use the right blade (*Box, right*). The other is to run a strip of masking tape along the cutline. Masking tape holds the surface of melamine together, which further prevents tearout.

A Simple Straightedge — Of course, you'll still need a way to guide the circular saw in a straight line as you cut. I like the simple approach for this: Just buy a sheet of $\frac{1}{4}$ " hardboard, and cut a strip about 8" wide from one edge.

Using the "factory" edge of this strip to guide the base of the saw assures



that the saw will travel in a straight line. To position the straightedge the correct distance from the cutline, make a simple setup block from scrap wood (*Photos, below*).

Support the Sheet—It's also important to support the sheet of melamine on both sides of the cutline. If it isn't supported, the cut portion of the sheet can fall away, causing a ragged tear.

For the setup shown above, sawhorses will support the piece. But if you were cutting *across* the sheet instead, you'd want to prop it up on a pair of 2x4s to prevent it from falling.



A setup block lets you easily position the straightedge in relation to the cutline.



The setup block matches the distance from the blade to the edge of the base.

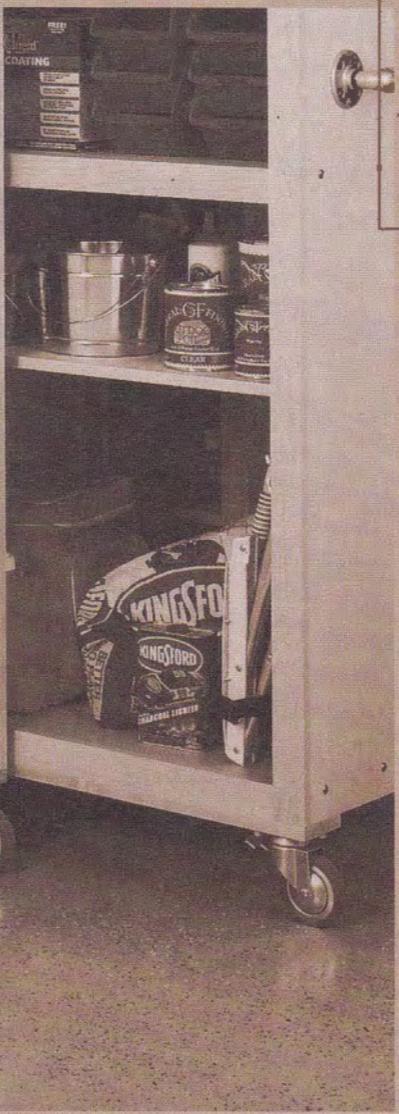
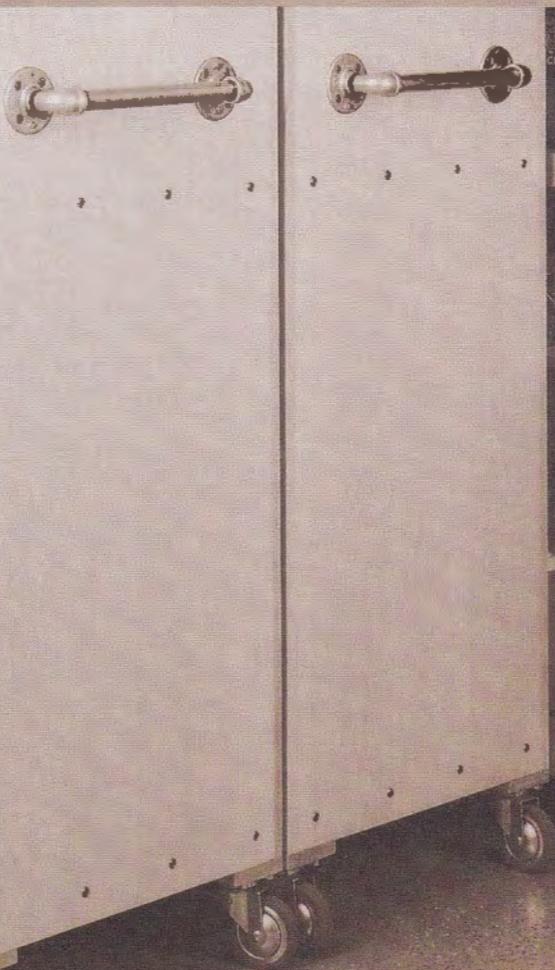
Chip-Free Blades

The blade that comes on most circular saws is designed for making rough cuts in 2x4s and other dimensional lumber. And while it works great for these cuts, it has a tendency to chip the coated surface of melamine badly.

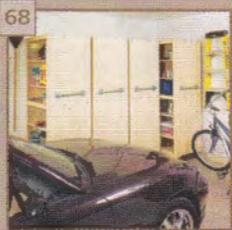
Luckily, you can easily convert any circular saw into a smooth-cutting tool. Just buy a 140-tooth plywood-cutting blade like the one shown in the *Photo* above. I picked this one up at my local home center for under \$5. Each tooth is very small, so it takes a small "bite" out of the material as it cuts, resulting in less chipout on the melamine and a much smoother surface. These blades dull quickly, however, so buy a handful of them (four or five) if you plan to build all the components of the laundry center.



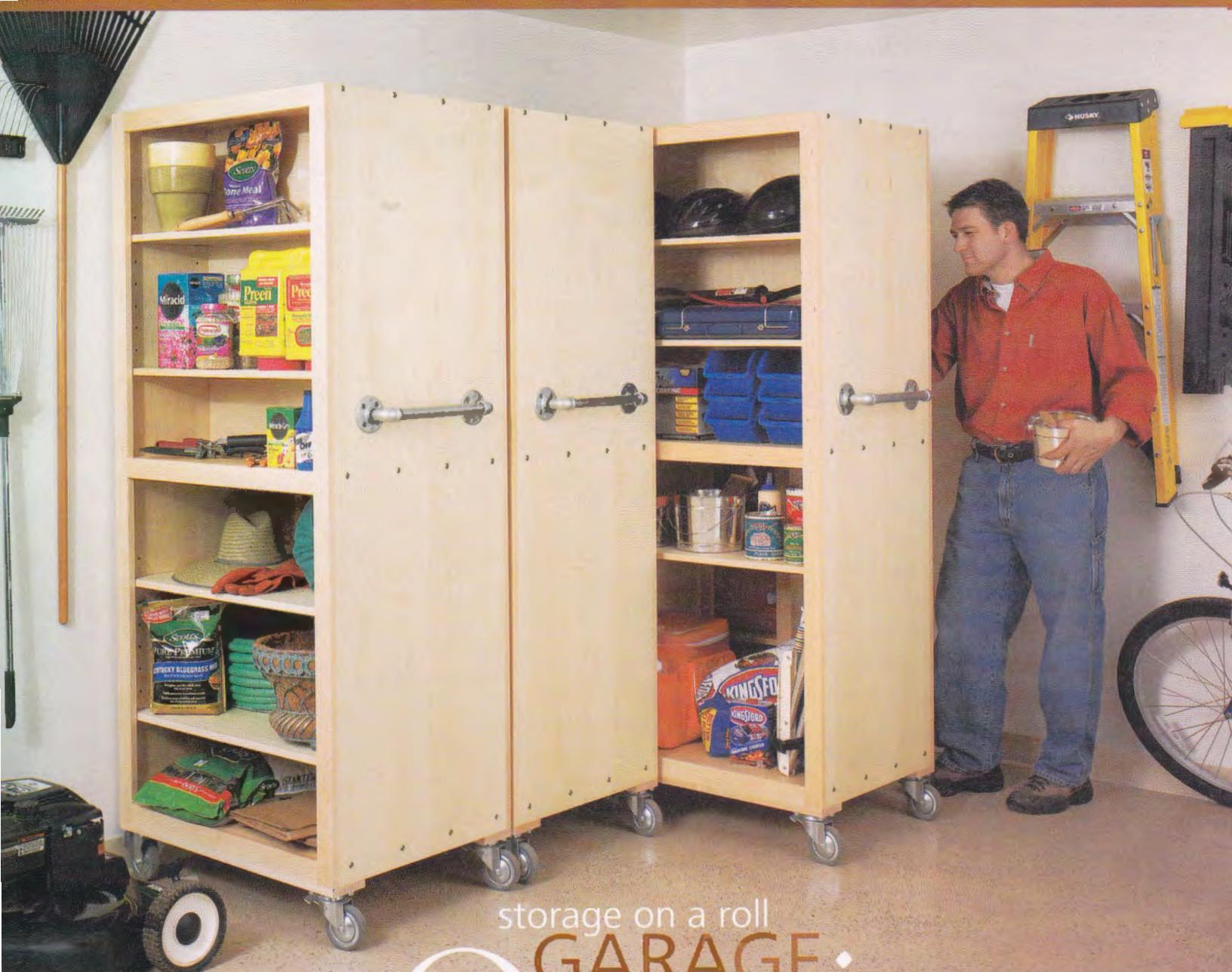
garage shop



If your garage is like most, it has two identities: garage and shop. And these identities are constantly at odds with one another. Now you can end the battle with three great projects that hold all your supplies and equipment, while still letting you park your cars.



- 68 Roll-Out Garage Organizers**
- 74 Stowaway Storage Loft**
- 78 Utility Shelf**



storage on a roll

GARAGE Organizers

It only takes a few sheets of plywood and a few hours of shop time to add big-time storage to your garage with these organizers. And putting them on wheels makes it easy to access all your supplies quickly.

It takes all sorts of stuff to keep a modern household running smoothly—lawn and garden supplies, car care products, and recreational gear, just to name a few. And most of it ends up in the garage, often squeezing the car out of its rightful place.

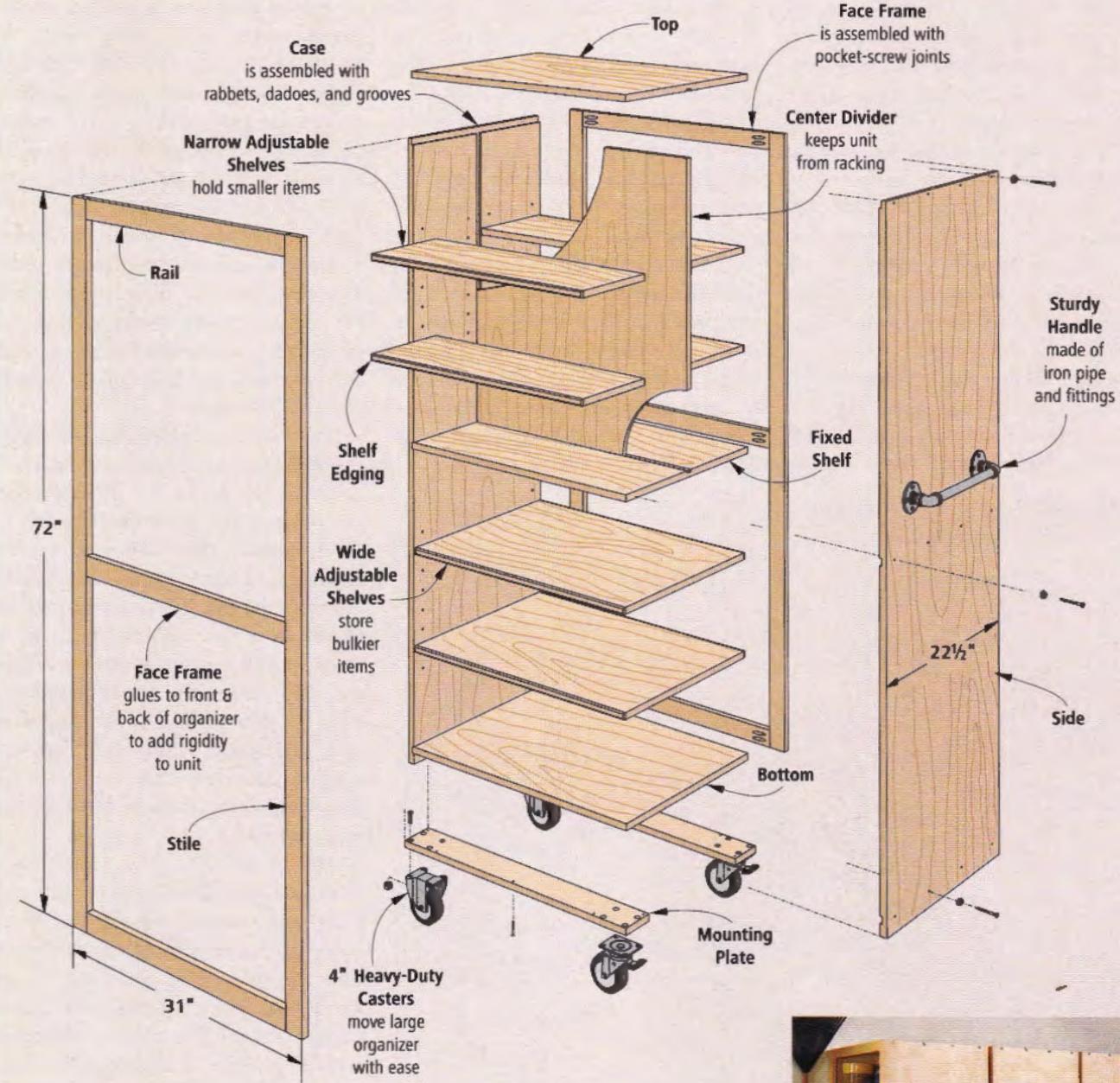
Now, finding a place to put all of these household necessities is one thing. (There's always room to cram in just one more item, right?) The real

trick here is making that storage easily accessible, so you can actually find what you're looking for.

One of the best ways I've seen for getting a handle on garage storage is the system shown above. It features a bank of tall, mobile organizers that line the wall of the garage like enormous filing cabinets. To use the organizers, you simply pull out one of the units, grab what you need, and then roll it back in place.

CONSTRUCTION VIEW

Overall Dimensions: 34" W x 24" D x 77 $\frac{1}{4}$ " H

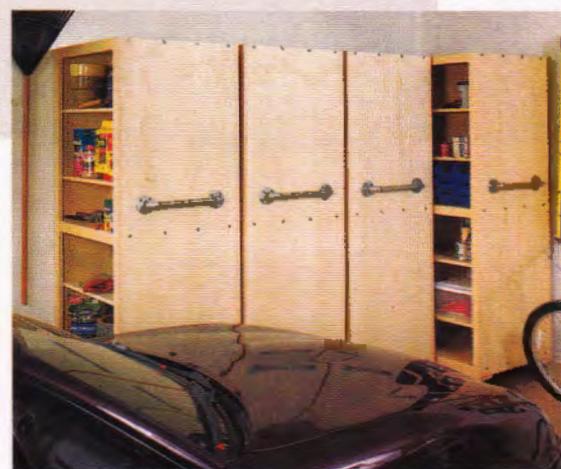


To provide easy access, these versatile units are open on both sides. Smaller items are stored in the upper part of the case, which is divided into front and back compartments, each with a set of narrow shelves (*see the Construction View, above*). The lower section contains wide shelves to accommodate bulkier and larger items.

Because these organizers have such a large capacity, they're bound to get loaded down—so they have to be

sturdy enough to support the weight. Also, since they're open on each side (there is no back), they presented an interesting design challenge—how to keep the units from racking.

The answer to this challenge is in the construction details. A large center divider provides substantial structural stability, and a hardwood face frame on each side contributes additional rigidity. Even with these extra elements, the cases are still easy to build.



These organizers give you the best of both worlds by making items accessible while still leaving room to park your car.

A Simple Box Makes a Quick Case

Building the case is the first order of business for these organizers. Each case is a large plywood box that's open on both sides, allowing convenient access from two directions.

The construction of the case is fairly straightforward. It's composed of two sides (A), a top and bottom (B), a fixed shelf (C), and a center divider (D)—all made of $\frac{3}{4}$ " plywood (see *Case Assembly*, below). I used maple plywood, but fir plywood would also work fine for this project.

Start with the Sides—The plywood panels that make up the case can be ripped to width on the table saw. But using a table saw to

crosscut such wide panels to length presents a problem, as they'd be extremely awkward to handle. The solution is to use a circular saw and a straightedge to guide the base of the saw. This straightedge can be a store-bought cutting guide, or you can make your own guide in the shop easily (see page 71).

Joinery Details—Once you're finished cutting the side panels to size, you can turn your attention to the joinery that's used to assemble the case. The top, bottom, and fixed shelf fit into rabbets and dadoes in the sides. Grooves in the side panels, top, and fixed shelf hold a center divider.

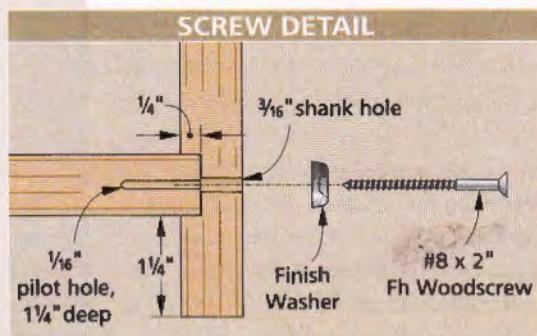
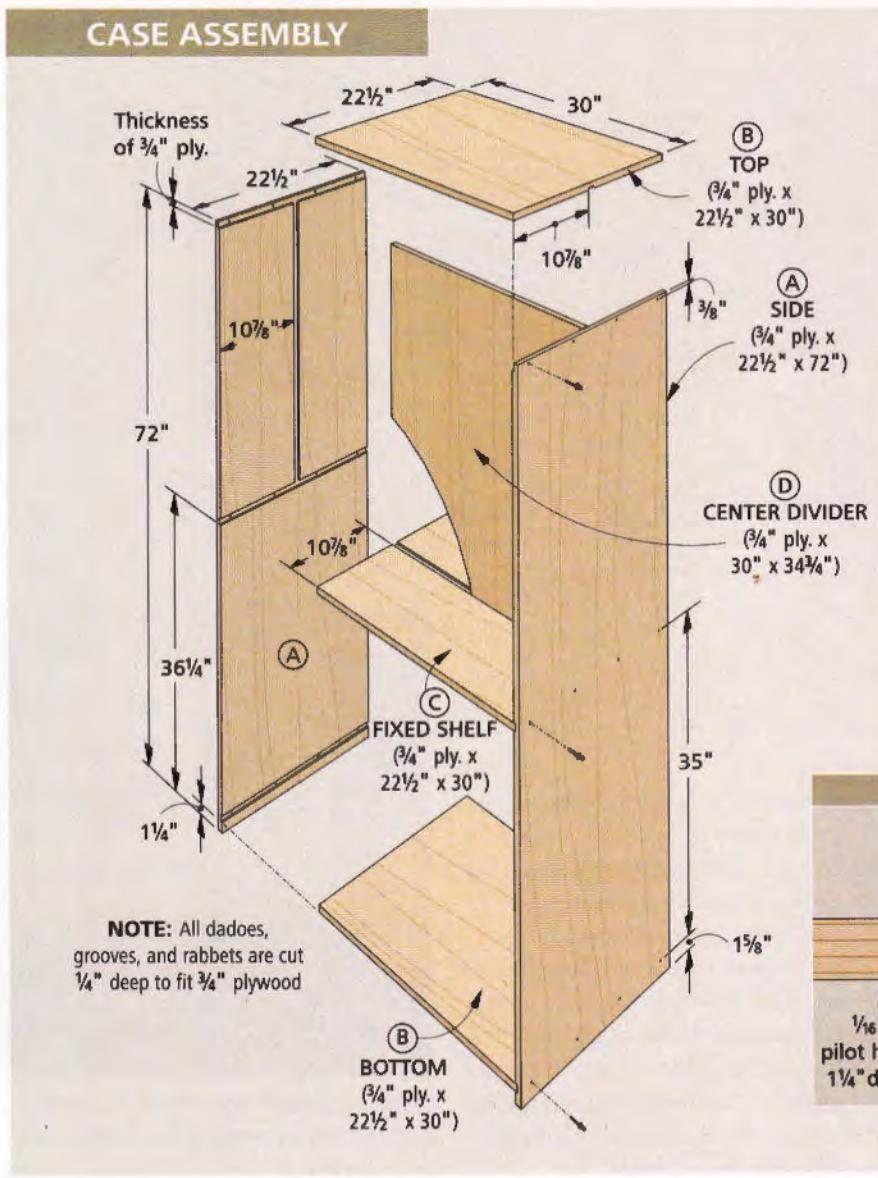
Here again, the large size of the panels makes cutting the joinery an awkward proposition on the table saw. So to make it easier, use a handheld router and another shop-made cutting guide to rout the joints. (See page 71 to learn how to make the guide.)

Another thing worth mentioning here is the type of router bit. I used a straight bit, as you might have expected. But it's a slightly undersized bit that's specially made to produce snug-fitting joints when working with $\frac{3}{4}$ " plywood, which is slightly thinner than $\frac{3}{4}$ " (see page 71).

Now about the routing sequence: Rout the dadoes and rabbets first. Then rout the groove for the divider, using the center dado as a stopping point.

Assemble the Case—Once the joinery is all complete, you're ready to assemble the case. These large plywood panels are a bit cumbersome to work with, so you'll want to have a helper on hand during the assembly process. Also, be sure to dry-fit the case first, and make any adjustments that are needed. Then pre-drill the holes for the woodscrews used to hold all the parts together.

When everything is square and it all fits well, go ahead and glue the joints and put the case together. Start by fitting the bottom and fixed shelves into the sides. Then slide the center divider into place, and cap the assembly off with the top. The screws—together with decorative finish washers—act as "clamps" to hold the case together while the glue is drying.



Plywood Tips & Tricks

When working with plywood, there's more to getting accurate cuts and routing perfect-fitting joints than meets the eye. These tips will help.

Cutting Guides—One of the simplest and most effective things you can do is make a pair of cutting guides: one for your router and another for your circular saw (*Photos, right and below*). Like their names imply, these cutting guides direct the base of the tool, producing a straight, accurate cut.

There's nothing complicated about making a cutting guide. It consists of a plywood (or hardboard) base for the tool to ride on and a wood fence to guide the base of the tool during the cut.

The edge of the base indicates the path of the blade (or bit). You simply align this edge with a layout line, clamp the guide in place, and run the tool against the fence. **Note:** For more information about cutting guides, see WorkbenchMagazine.com.

Tight Dadoes—Many plywood case projects (like these organizers) require routing dadoes and grooves to join the plywood parts together as sturdily as possible. For strength and appearance, the width of these cuts must match the thickness of the piece that's going to fit into the joint.

The only problem is that plywood typically is thinner than its "nominal" size. For example, $\frac{3}{4}$ " plywood is really $\frac{23}{32}$ " thick. That's why it fits loosely in a dado that's cut with a $\frac{3}{4}$ " straight router bit.

A Better Router Bit—One way to get a snug-fitting joint is to use a special $\frac{23}{32}$ " straight bit that's sized to match the actual thickness of plywood (*see the Box at right*). **Note:** Undersized straight bits are also made for $\frac{1}{4}$ " and $\frac{1}{2}$ " plywood and are available from manufacturers such as CMT (CMTUSA.com) and Freud (FreudTools.com).



To get a straight edge in plywood, just clamp on a cutting guide, and hold the circular saw against the guide as you cut. Installing a 40-tooth blade on the saw ensures a clean cut.

The Straight Story



23/32" Straight Bit

3/4" Straight Bit

These two straight bits look identical, but the dadoes they cut tell a different story. The $\frac{23}{32}$ " bit on the left creates a tight-fitting joint that matches the actual thickness of $\frac{3}{4}$ " plywood. The $\frac{3}{4}$ " bit on the right produces a sloppy fit.



This long cutting guide is ideal for routing grooves in a large sheet of plywood. The edge of the guide indicates the path of the bit. To use the guide, lay out one edge of the groove, align the edge of the guide with the line, and then make the cut.



Building the Face Frames

With the case complete, converting it into a sturdy storage unit is just a matter of adding a couple of hardwood face frames, the adjustable shelves, casters, and a handle.

Face Frames First—As you can see in the *Illustration* below, a face frame is attached to each side of the case. These frames cover the exposed plywood edges, but they're more than just a pretty facade. They provide additional rigidity that will help prevent the storage unit from

racking. Since the face frames are such an integral structural element, it's best to assemble the frames before mounting them to the case. This ensures a strong, solid cabinet.

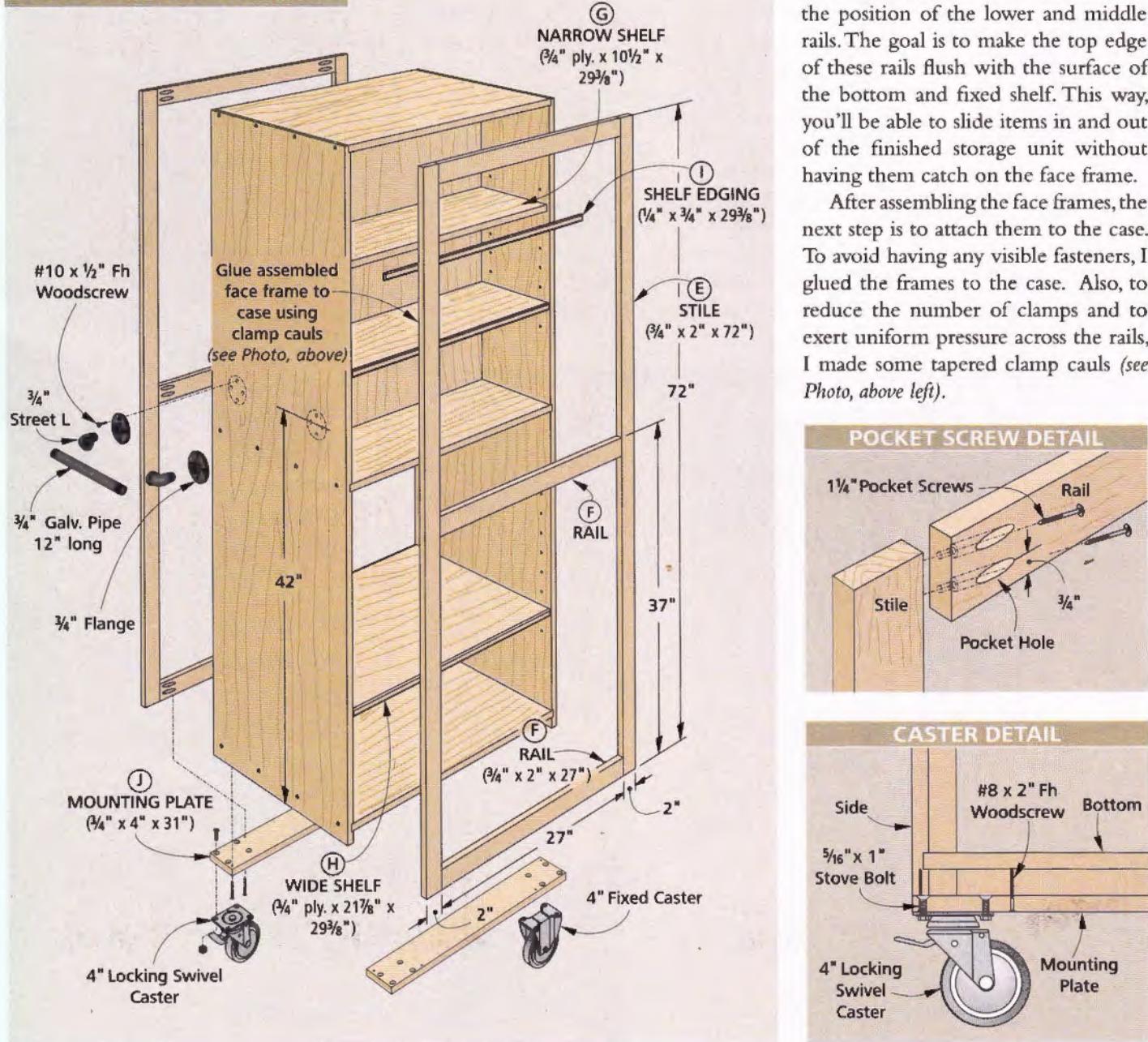
The face frames are made from $\frac{3}{4}$ "-thick hardwood. (I used maple.) Each frame consists of two vertical stiles (E) and three horizontal rails (F) that are assembled using butt joints and pocket screws (see *Pocket Screw Detail*).

The face frame is sized to fit flush with the sides and top of the cabinet. Another important element to note is the position of the lower and middle rails. The goal is to make the top edge of these rails flush with the surface of the bottom and fixed shelf. This way, you'll be able to slide items in and out of the finished storage unit without having them catch on the face frame.

After assembling the face frames, the next step is to attach them to the case. To avoid having any visible fasteners, I glued the frames to the case. Also, to reduce the number of clamps and to exert uniform pressure across the rails, I made some tapered clamp cauls (see *Photo*, above left).

Using a slightly curved caul while you glue on the face frames ensures even distribution of clamping pressure.

ADDING FACE FRAMES



Finishing Up

Only a few small details remain now, and then your garage organizers will be ready to roll. Specifically, those details are to build the adjustable shelves, add heavy-duty casters to the underside of each organizer, and then finally round up a few plumbing fittings to make the handles.

Adjustable Shelves—In order to accommodate the wide range of storage items found in almost every garage, the case has a number of adjustable-height plywood shelves. Narrow shelves (G) occupy both sides of the upper compartment. The lower compartment contains full-width shelves (H). Solid-wood edging (I) covers the exposed edges of the shelves and keeps them from chipping. You'll only need to apply edging to one edge of the narrow shelves. But since both edges of the wide shelves are exposed, both edges require edging.

The shelves rest on supports that fit into holes drilled into the sides of the case. To keep the shelves from rocking, it's important to make sure that these holes line up precisely. In order to ensure proper alignment, I used a hardboard template that made this task quick and accurate.

As you can see in the *Illustration* at right, this template is nothing more than a piece of hardboard with a series of holes drilled at precise intervals along its length. To use the template to drill holes in the case sides, just set it on the bottom of the case against the face frame, and then drill the holes as shown

in the *Photo* at right. Repeat the process at all four pin-hole locations. A strip of masking tape around the drill bit acts as a depth gauge to prevent you from drilling through the case sides.

Add the Casters—To make each organizer mobile, it's fitted with a set of four casters: two fixed casters, and two swivel locking casters.

The casters aren't actually attached directly to the case. Instead, they're bolted to two hardwood mounting plates (J), which are then in turn secured to the assembled organizer.

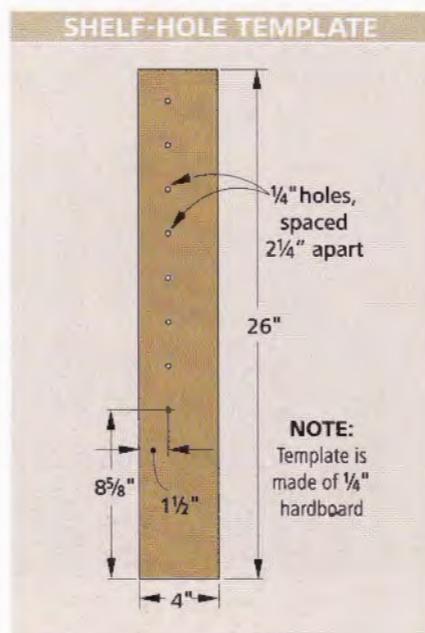
This process takes a bit more time and material, but it does ensure the casters won't tear out when rolling over uneven surfaces, which many garages have. The mounting plates are screwed to the face frames and the sides of the case.

Add Heavy-Duty Handles—Each organizer is equipped with a sturdy shop-made handle that makes it easy to pull out. This handle is a 12"-long piece of $\frac{3}{4}$ "-diameter iron pipe that's threaded on both ends. (This sort of pipe is generally available already cut and threaded to these specifications. Or your hardware store or home center can do it on-site for a small cost.) The pipe is held in place by fittings called "street L's" that screw into flanges. Once these parts are screwed together, just mount the flanges to the cabinet sides.

Once your organizers are complete, the last step, of course, is to put away your garage clutter and enjoy all of your newfound space.



Butt the same edge of the hole template against the face frame and the divider when drilling the support holes.



MATERIAL LIST

Part	Qty	Size	Material
A	2	$\frac{3}{4}$ " x 22 1/2" x 72"	Maple Plywood
B	2	$\frac{3}{4}$ " x 22 1/2" x 30"	Maple Plywood
C	1	$\frac{3}{4}$ " x 22 1/2" x 30"	Maple Plywood
D	1	$\frac{3}{4}$ " x 30" x 34 3/4"	Maple Plywood
E	4	$\frac{3}{4}$ " x 2" x 72"	Maple
F	6	$\frac{3}{4}$ " x 2" x 27"	Maple
G	4	$\frac{3}{4}$ " x 10 1/2" x 29 3/8"	Maple Plywood
H	2	$\frac{3}{4}$ " x 21 1/8" x 29 3/8"	Maple Plywood
I	8	$\frac{1}{4}$ " x $\frac{3}{4}$ " x 29 3/8"	Maple
J	2	$\frac{3}{4}$ " x 4" x 31"	Maple

HARDWARE (for one organizer):

- (34) #8 x 2" Fh Woodscrews
- (16) 5/16" x 1" Stove Bolts
- (4) 4" Casters (two fixed, two swivel locking)
- (24) 1 1/4" Pocket Screws
- (24) 1/4" Shelf Supports
- (8) #10 x 1/2" Fh Woodscrews
- (1) 3/4" Galvanized Pipe, 12" long (threaded both ends)
- (2) 3/4" Street L's
- (2) 3/4" Flanges
- (24) Finish Washers



STOWAWAY Storage Loft



Use the ceiling space as a new area to store your garage items. This shelf is the perfect place for large storage containers, too.



This storage loft is sized to hold plastic storage containers, but it will also support many other lightweight garage items.

If lack of storage space is a problem in your garage, don't worry — things are looking up. This ceiling-mounted loft adds extra storage capacity in a place you may have overlooked: overhead.

Looking for more storage space in your garage? Look up. Even though the walls and floor may be jam-packed, there's often room up above that can be used as a storage area for sporting goods, seasonal items, and other garage clutter.

One way to take advantage of that space is to build this ceiling-mounted storage loft. As you can see in the *Photo* above, the loft is a suspended platform that's used to hold bulky or lightweight items that don't fit elsewhere.

Seasonal and other specialty items are stored in plastic containers with lids to seal out dust. The loft is designed so that each storage bay holds two 17-gallon Rubbermaid containers sitting side by side (*Photo, left*).

This is a big plus in my garage, as I store all of my holiday decorations and extra gardening supplies in these bins. And it's out of the reach of little children, so it keeps anything potentially hazardous out of their hands.

Another option is to use smaller containers. I set three 19-quart containers side-by-side in one bay and then stacked 12-quart containers on top of them (*Photo, above*). Of course, you can also store any item that is relatively light on the shelves. And since the loft compartments are open at the ends, items can spill over from one unit to the next without hitting a divider.

Whatever combination of containers you choose, you'll want to get them in the planning phase *before* you build the loft. That way, you'll have just the right



This over-the-top shelf can be built as long—or as short—as your garage storage needs demand. And the best part about it is it's simple to make with inexpensive dimensional lumber and only a handful of woodscrews.

amount of room for all your necessities and can decide how much extra space you'll actually need—and not end up with extra items still piled up on the floor.

Planning & Sizing—When planning your storage loft, the first thing to consider is the last thing you'll actually have to do—installation. Even though the loft is intended for lightweight items, it still needs to be mounted securely to the ceiling. So make sure to locate the loft so it runs perpendicular to the joists or rafters overhead (*Planning Details*). That way, you'll have a solid mounting surface at each joist.

Once you've planned where you're going to install the loft, you can decide how long to make the frame rails. I cut my rails from 16-ft. 2x4s, so my first step in building the loft took place in the lumberyard rather than the workshop. I started there by choosing the straightest boards available. You could also rip the rails from wider stock.

After determining rail length, divide the loft into bays (defined by the placement of the vertical supports). I made my bays about 2" wider than two of the 17-gallon containers.

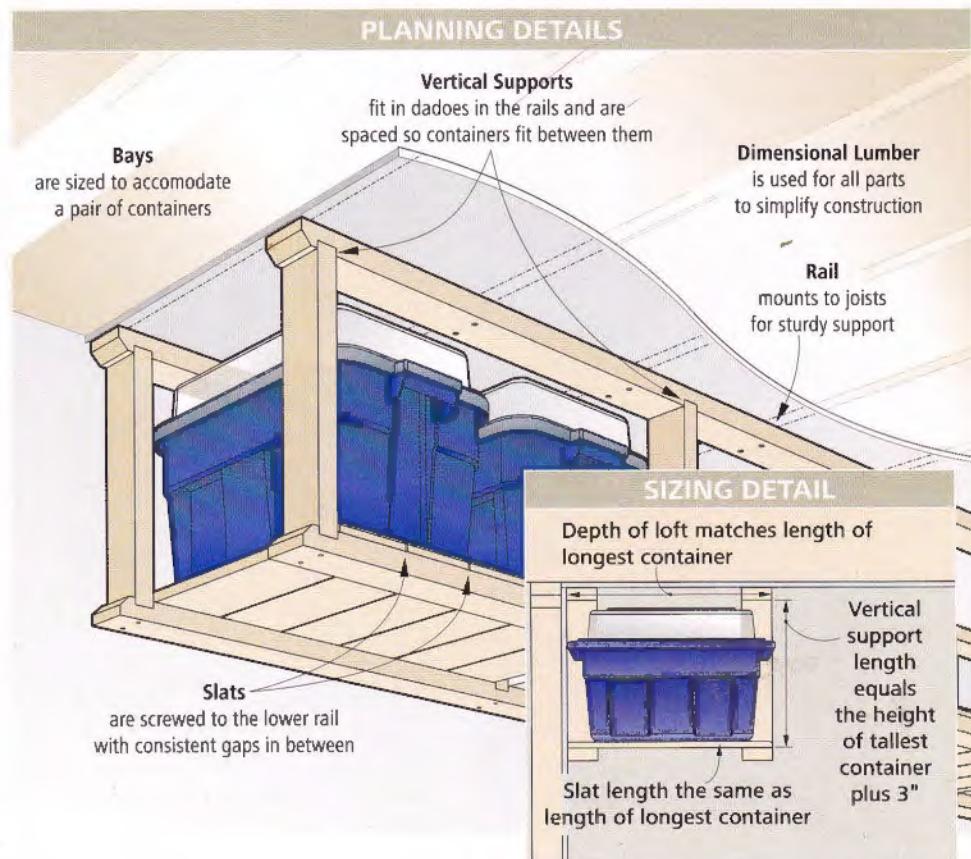
The length of the vertical supports establishes the height of the bay. This is why it's important to figure out the various containers that you will store. Then make your vertical supports the height of the container plus 3". This extra 3"

allows for the dadoes in the rails that the vertical supports fit into, the thickness of the slats, plus a little leeway to tip the container a bit when sliding it in and out of the loft. This adds to the convenience and accessibility of the shelves.

As for the length of the slats, be sure to measure your containers at their longest point and make the slats the same length. This provides for easier access.

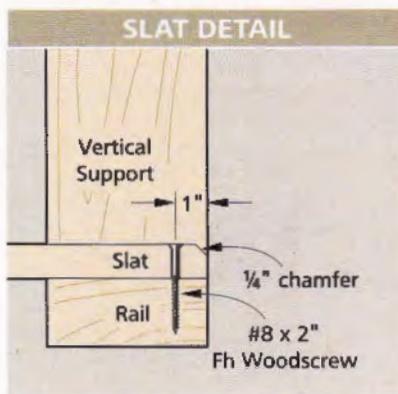
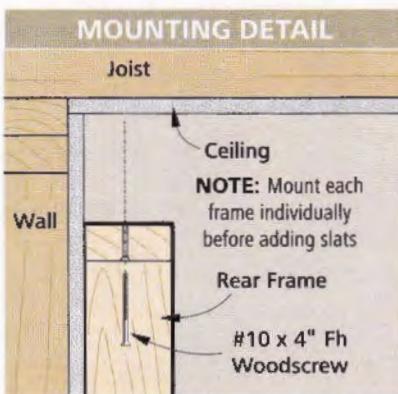
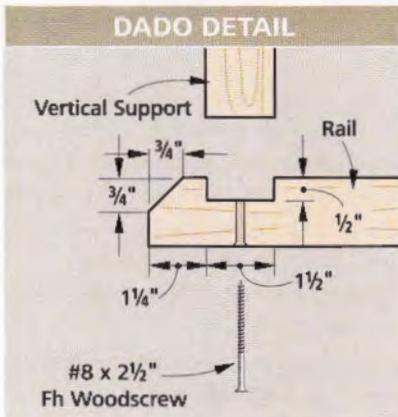
Once you round up all the 2x and 1x stock for building the loft, you don't need much else to build it—just a handful of screws, a drill, and a circular saw. We'll even give you a handy tip for gang-cutting dadoes with a circular saw on page 77.

You may also want to recruit a friend to help when you are ready to install the loft.





A framing square clamped to the drill press table quickly positions the slats to drill mounting holes. Just flip the board to drill the adjacent hole.



Loft Construction

Loft construction starts with the ceiling-mounted frames. Each frame is made up of two rails connected by vertical supports. All of the frame pieces are cut from 2x4 stock.

Rails—The first step you need to take is cutting the frame rails (A) to length. Then the rails need dadoes cut in them to receive the vertical supports (*Dado Detail*). The key here is that the dadoes in one rail have to align with those in its mate. Otherwise, the bays won't be sized consistently.

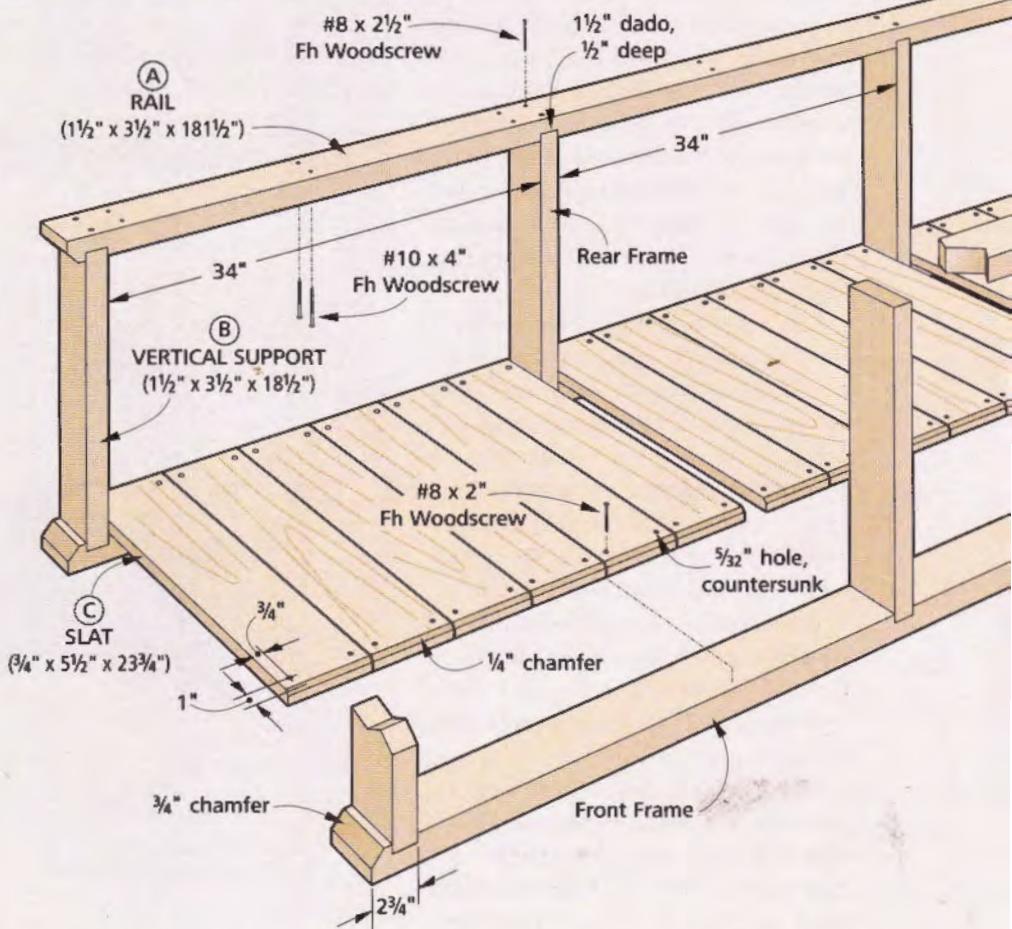
In my case, these rails were too long to wrestle onto the table saw. So I ganged the rails together and used a circular saw to cut the dadoes (*Sidebar, right*). Cutting the dadoes in all four rails at once ensures that they'll align and also will save you time.

Dado Jig—A shop-made jig helped me make the straight cuts I needed for square-shouldered dadoes (*Jig Assembly*, page 77). This simple jig has three parts: a base that serves as a platform for the saw, a fence to guide the saw, and a cleat that squares the jig to the edge of the boards.

After assembling the jig, you can trim the waste from one edge to create a reference edge. Then you're ready to gang-cut the dadoes as shown at right.

With the dadoes cut, the next step is to cut a chamfer on the ends of each rail. You can leave the rails clamped together for this operation (you won't need the jig, though). Then, be sure to tilt the base of the saw to 45°, and cut the chamfer across all the rails at once by running it across the ends of the boards.

CONSTRUCTION VIEW



CIRCULAR SAW TECHNIQUE: GANG-CUTTING DADOES

Vertical Supports—When you have finished with the rails, you're ready for the vertical supports (B) that join them (I used six vertical supports in each frame). The supports are cut to length from 2x4 stock. After that, you can glue and screw the supports in place between the rails to complete the frame construction.

Installation—It's best to install the frames now, *before* you have the weight of the slats to contend with. Though the frames aren't particularly heavy, they are awkward to handle. So you'll need to round up a friend to help you position and hold these long assemblies in place while you mount them.

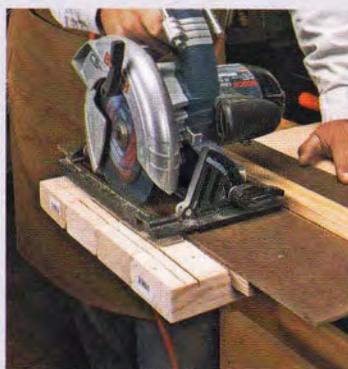
To make it easier to mount the rails to the joists, I would recommend pre-drilling holes in the rails. First, start with the rear frame, and then screw it in place, making sure it's flush against the wall (*Mounting Detail*).

To install the front frame parallel to the back section, you should first measure out from the wall the length of a slat (23 $\frac{3}{4}$ ", in my case) at both ends of the rear frame. Mark these locations, and then snap a chalkline to connect them. Now you can align the front frame with the chalkline, and then screw it in position.

Slats—With the frames installed, you can turn your attention to the slats (C) that make up the platform. These slats are cut to length from 1x6 stock. Cut or sand a chamfer on the front end of each slat to keep items from catching as you slide them into place.

Next, drill the pilot holes for connecting the slats to the frames. Rather than lay out each hole, you can save time by using the tip shown in the *Photo* on page 76. This also ensures that your holes are spaced evenly.

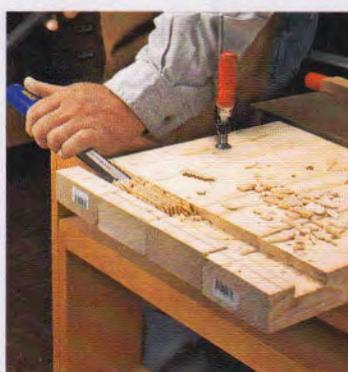
Finally, you should space the slats evenly between the vertical supports (the gap between the slats should be about $\frac{1}{8}"), and then screw them to the frames. Now you can load up your loft and bring a whole new sense of organization to your garage. ■$



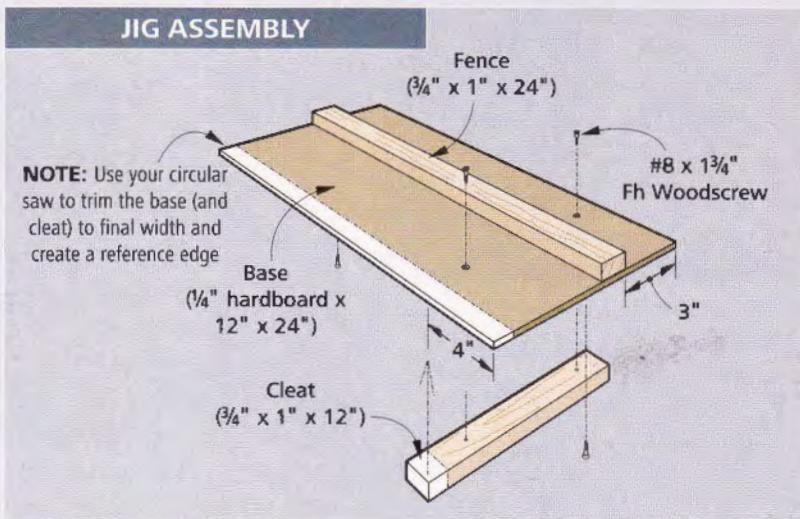
1] Align the jig's reference edge with a layout line running across all four rails, and clamp the jig in place. Adjust the saw to make a $\frac{3}{4}$ "-deep cut ($\frac{1}{4}$ " extra, to compensate for the thickness of the base). Run the saw along the fence to cut one shoulder of each dado. Reposition the jig, and cut the other shoulders the same way.



2] With both shoulders of the dadoes defined, remove the waste material between them. A good way to start is by reducing the amount of material that's there. To do this, make a series of cuts between the shoulders, moving the jig over slightly between each cut. (There's no need to clamp the jig during this step.)



3] Now it's cleanup time. Set the jig and the saw aside for this, and use a chisel and mallet to knock out the comb-like waste you created in the previous step. When you get that done, there will still be some kerf tracks in the bottom of the dadoes. Just use a chisel to pare off those ridges and flatten the bottom of the dadoes.





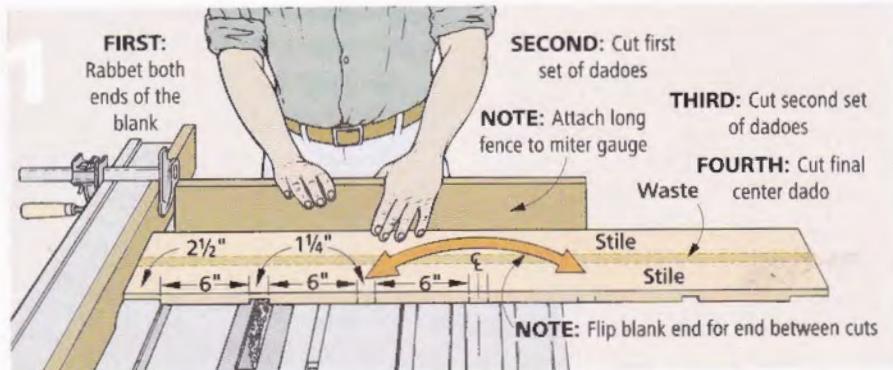
Utility Shelf

These inexpensive pine shelves are constructed to handle heavy-duty loads, and their modular design makes it easy to add shelves as your storage needs grow.



The shelves are notched on the ends to fit in place between the "rungs" of the ladder-like supports.

This utility shelf has a lot of good things going for it—it's made of inexpensive pine lumber; it's quick and simple to build; and it's strong and functional. And beyond all that, its design makes it easy to add more shelf sections to the unit when you need more storage space.



1] Matching dadoes and rabbets in two pieces form the mortises in the supports. To ensure alignment, make the cuts in a wide blank, and rip two pieces from the blank.

To see what I mean, take a look at the *Photo* at left. It has two sets of shelves that are mounted between three ladder-like supports. (The shelves "share" the support in the middle.) And all of the shelves are adjustable, so they can easily accommodate items of varying height.

LADDER-LIKE SUPPORTS

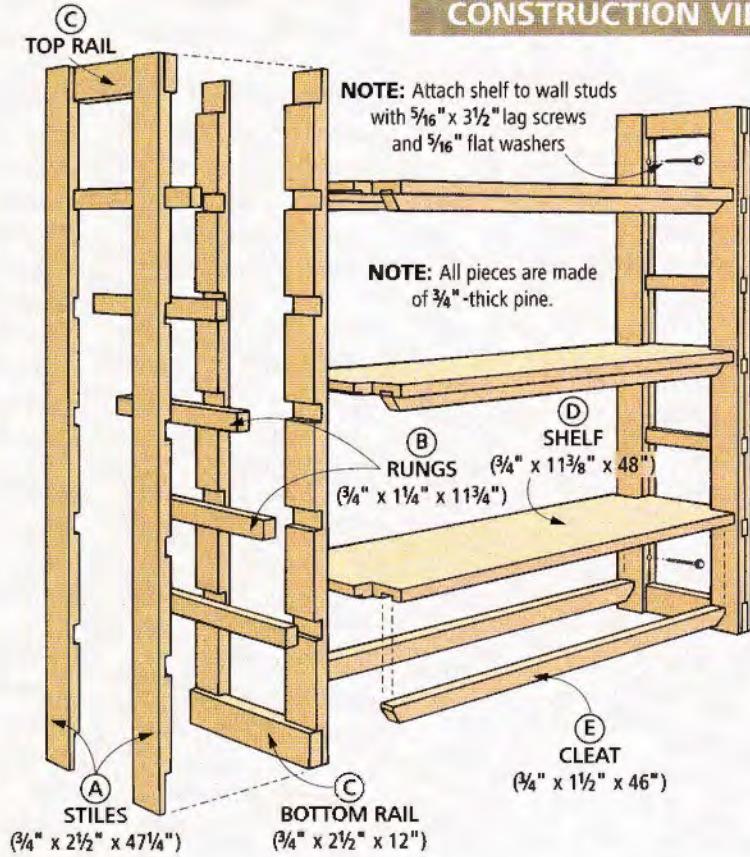
A utility shelf usually gets loaded down with a lot of items, some pretty heavy. So to support the weight, I designed sturdy supports that resemble a ladder. The solid-wood rungs are mortised into corner posts to provide support for the shelves.

But even with all the mortises, you can save a lot of time building this shelf using a simple construction method. Each corner post is made of two long stiles (A). Rabbets and dadoes in the inside face of each stile form the mortises once the two pieces are glued up.

Corner Posts—The key when making the two-piece corner posts is to ensure that all of the mortises match up perfectly—not only in both halves, but also from post-to-post. Of course, you could always mark eight different pieces and cut each individual mortise separately. But then you run the risk of the mortises not lining up in both halves of the corner posts.

An easier way involves making both pieces of each corner post out of a single 1x6. This allows you to cut all of the rabbets and dadoes for both halves of a corner post at once. But remember, the mortises also need to align from corner post to corner

CONSTRUCTION VIEW



post. This is accomplished by using an auxiliary rip fence to position the 1x6s for each pair of cuts.

How It Works—Making the corner posts is actually a lot easier than it sounds. It does involve quite a bit of flipping boards end-for-end, and adjusting the fence. But the results are worth the effort.

Start by laying out all of the rabbets and dadoes on an extra-wide blank. (I used a 1x6.) Now take a look at *Fig. 1* to see the sequence of cuts. The idea is to work from each end of the blank

toward the middle, flipping the board end-for-end between cuts.

With a $\frac{3}{4}$ " dado blade set up in the table saw, position the rip fence to cut the shoulder of the rabbet on both ends of all four 1x6 blanks (*Fig. 1*). Then clear away the waste.

Once all of the rabbets are cut, reposition the fence to cut the shoulder of the closest dadoes. Now cut the shoulder of these dadoes in all of the blanks. Next, reset the fence, and make a second pass to complete each dado. At this point, you should

have four 1x6's with rabbeted ends and a dado $8\frac{1}{2}$ " from each end.

You'll have to reposition the fence again to cut the next pair of dadoes the same way. Keep repeating the process until you've cut five matching dadoes in all four blanks.

Now that the time-consuming part is done, simply rip two $2\frac{1}{2}$ "-wide pieces from each 1x6 blank to make the individual stiles.

Rails & Rungs—There's one more thing to take care of before moving on to the assembly stage. That's making the rungs (B) and the top and bottom rails (C) that complete the supports.

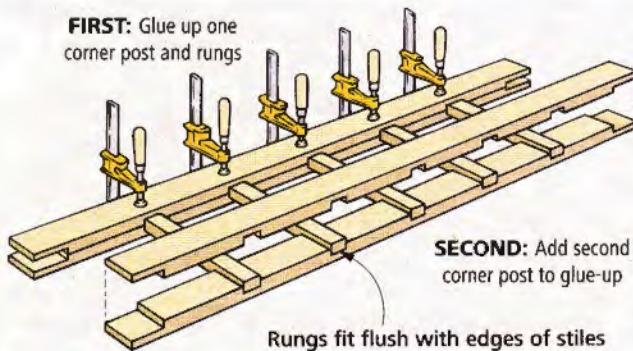
First, rip stock to width to fit the rabbets and dadoes you just completed. Then to finish, crosscut each piece 12" long.

GLUE-UP & ASSEMBLY

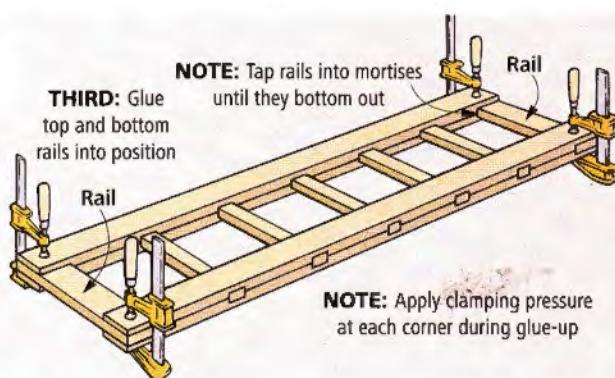
Now it's time to assemble the supports. With so many pieces to wrestle around, this can get hectic, so I made it easier by using the three-step process shown below.

First, I glued up a single corner post with the ends of the rungs flush with the outside edge of the stiles, as shown in *Fig. 2*. To keep the pieces from shifting around during glue-up, clamp each joint. Then repeat the process for the second corner posts, again clamping directly over the joints (*Fig. 2*).

The top and bottom rails are the final pieces to be added to the end supports. Start by lightly tapping them into position until they bottom out in the mortises. They should also be flush with the ends and edges of the corner posts (*Fig. 3*).



2] To form the support, place the rungs in one pair of stiles, and glue and clamp the other stiles in place.



3] To finish, tap the top and bottom rails into position, and then glue and clamp them in place.

ADJUSTABLE SHELVES

Once the supports are done, work can begin on the adjustable shelves. One thing you'll notice about the shelves is that the ends "split the difference" on the thickness of the rungs. This way, you can add on another shelf section later by making only one more support. The ends of the second set of shelves simply share rung space with the first set.

Solid wood is a good choice for the shelves because of the long span, but I didn't want to go to the trouble of gluing up narrow strips. So to keep the construction simple, I looked for the flattest 1x12 stock that I could find.

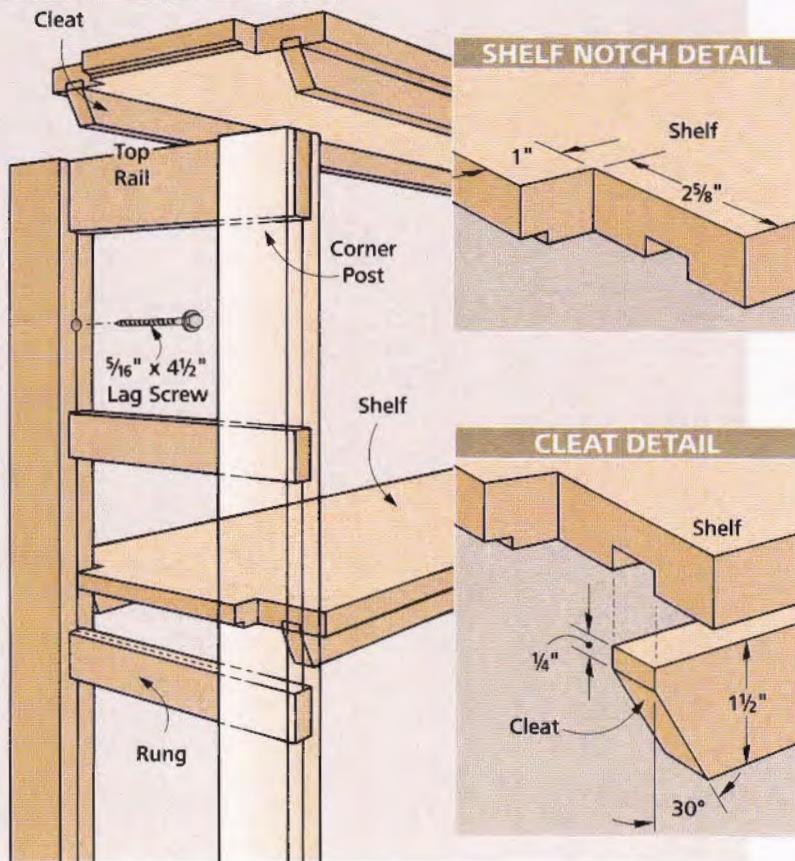
Grooves—To keep the shelves from sagging, I made two $\frac{3}{4}$ "-thick pine cleats (E) that fit into grooves underneath each shelf. To cut the grooves, mount a $\frac{3}{4}$ " dado blade in the table saw, and set the rip fence. Then, with the workpiece riding against the fence, cut the groove in each piece (*Fig. 4*).

Rabbets—To keep the shelves from shifting side-to-side on the rungs, the ends need to be rabbeted. To cut these rabbets, I partially buried the dado blade in an auxiliary fence (*Fig. 5*).

Notches—Finally, the shelves are notched to fit around the supports. To cut these notches, first lay them out carefully (*Shelf Notch Detail*). Then use a jig saw or a band saw to complete them.

Bevel the Cleats—Notice above (*Cleat Detail*) that the ends of the cleats are beveled. This provides the clear-

CONSTRUCTION VIEW



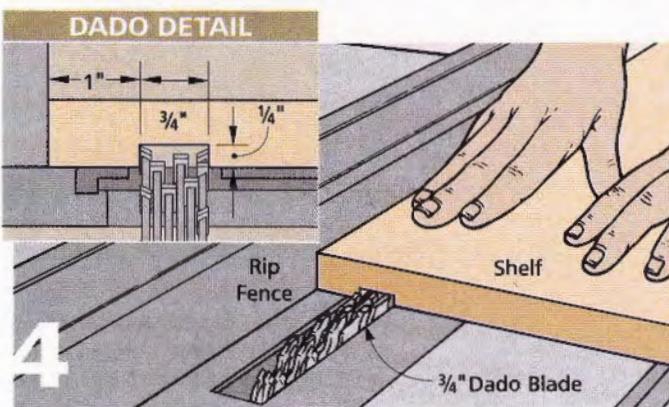
ance that's needed to lift the shelves in and out. After beveling the corners, glue the cleats into the grooves in the bottom of each shelf.

INSTALLING THE SHELF UNIT

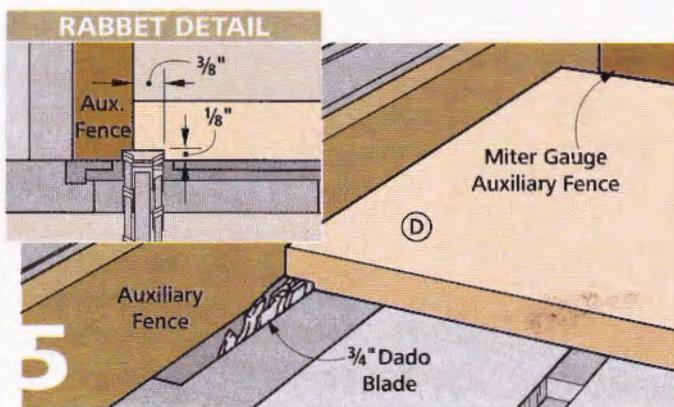
Before mounting the unit, I applied three coats of a protective polyurethane finish. When you get ready to mount the shelf, there are a couple of important things to note. First, you'll want to use large lag screws to support

the weight of the shelf and whatever is stored on it. (I used $\frac{5}{16}$ " x $4\frac{1}{2}$ " lag screws.) And second, be sure that you screw into the wall studs.

Start by attaching one support so that it's plumb. Next, with a shelf in place, position and attach the remaining support. (**Note:** If the wall has a bad bow, rip a small amount ($\frac{1}{8}$ ") off the back edge of the shelves.) Then gather up all the items you'll want to store on your new shelving. ■



4] To cut the grooves in the shelves, install a dado blade, adjust the rip fence, and pass the shelf over the blade.



5] To cut the rabbets in the ends of the shelves, you'll need to partially bury the blade in an auxiliary fence.



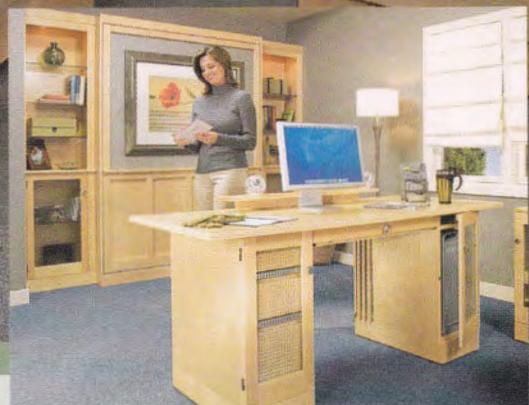
take back the bedroom

Small rooms (like spare bedrooms and closets) have limited space to begin with, and finding extra storage is always challenging. The key to making these rooms work smarter, not harder, is to make better use of the space that often goes to waste.



82
92

Space-Saving Murphy Bed
Bedroom Closet Organizer



SPACE-SAVING Murphy Bed

Get the most out of a spare bedroom by adding this space-saving fold-down bed. When your guests arrive, it pivots down from the wall—and then folds up to give you plenty of extra space.

A spare room works best when it pulls double-duty, often as a bedroom *and* a home office. But this arrangement has an inherent problem—the bed takes up most of the space, leaving little room for anything else.

By building a Murphy bed that folds down from a cabinet, the room

can be ready for overnight guests at a moment's notice. And when the guests are gone, the bed folds back into the cabinet just as fast, letting you reclaim that space for other activities.

What makes this quick conversion possible is a specialized hardware kit from Create-A-Bed (see Sidebar, right) that allows the bed to fold up into the cabinet. When assembled, these pieces of hardware act in concert to produce a smoothly operating Murphy bed.

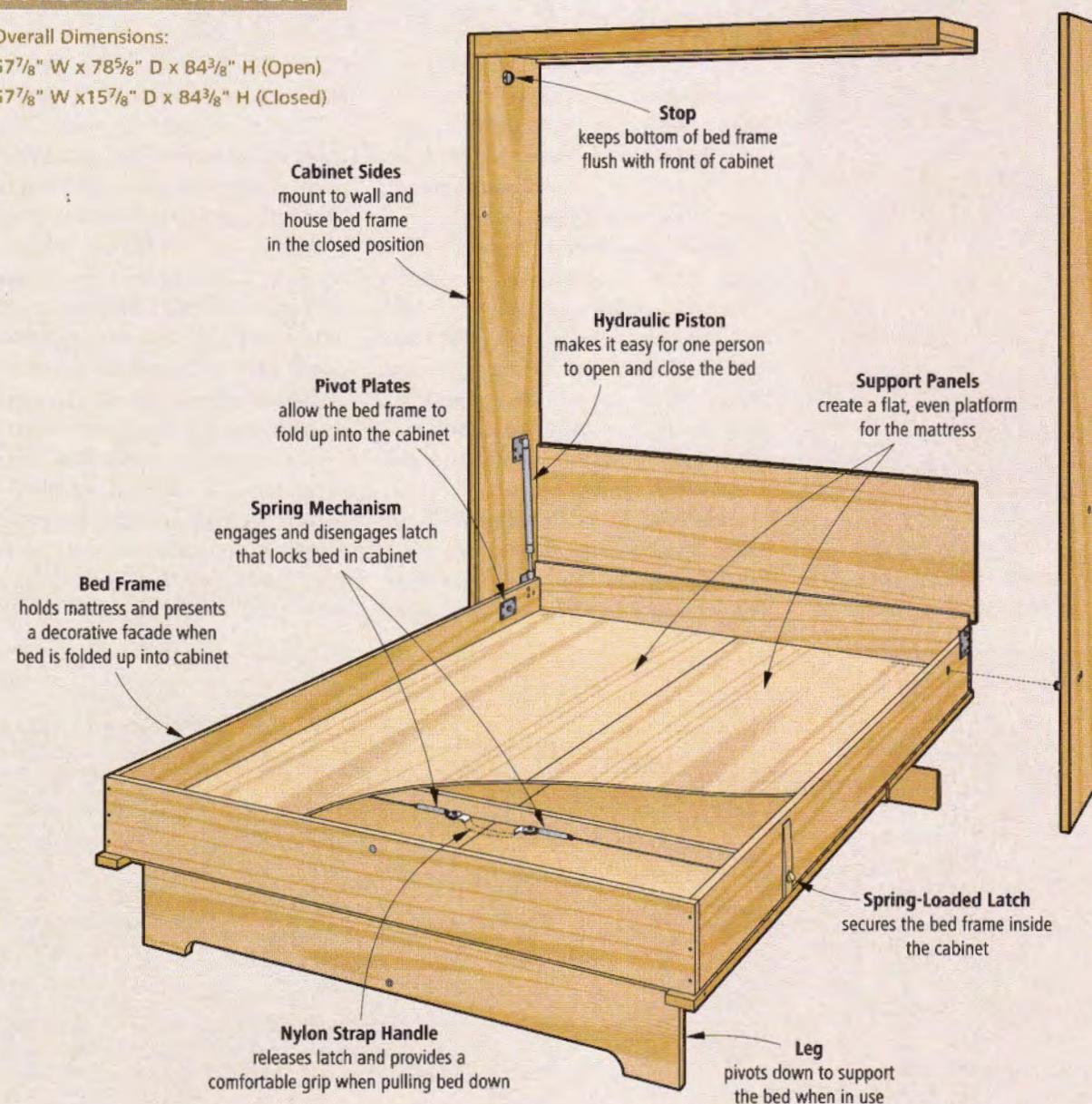
Even with the hardware, building a Murphy bed is, admittedly, no small undertaking. But the woodworking techniques involved are fairly straightforward, and our construction tips certainly take "Murphy's Law" out of this Murphy bed project.

CONSTRUCTION VIEW

Overall Dimensions:

57 $\frac{7}{8}$ " W x 78 $\frac{5}{8}$ " D x 84 $\frac{3}{8}$ " H (Open)

57 $\frac{7}{8}$ " W x 15 $\frac{7}{8}$ " D x 84 $\frac{3}{8}$ " H (Closed)



HOW IT WORKS

When building a Murphy bed, keep in mind that the details of the design shown in this article are specific to the Create-A-Bed hardware kit we purchased from Rockler (vertical installation for a full-sized mattress).

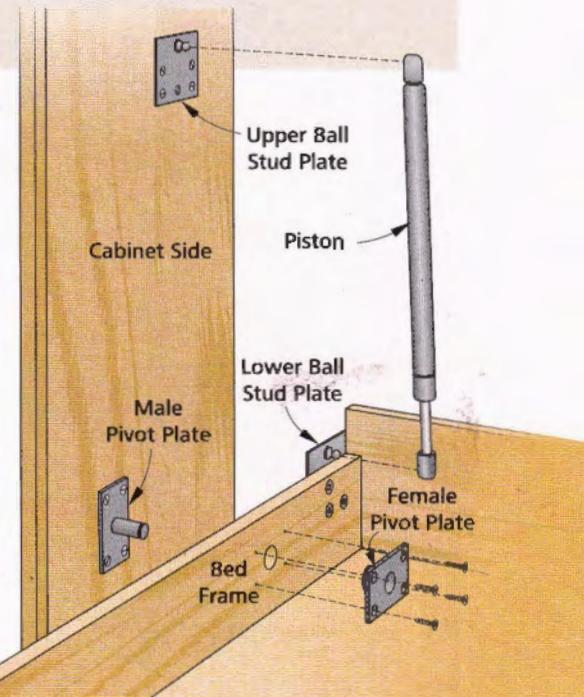
The main hardware pieces in the kit are the pivot plates, pistons, and ball stud plates (*see illustration*).

There are two pairs of pivot plates in the Murphy bed kit: Each pair

includes a male and female pivot plate that connect the bed frame to the cabinet and allow the bed to fold up and down.

Two hydraulic pistons help control the descent of the bed and also aid in lifting the bed back into the storage cabinet.

Each piston snaps onto two ball stud plates, which are installed on both the cabinet side and on the bed frame.





Use couplers to extend your pipe clamps when edge-gluing the face panel. An over-and-under arrangement of clamps prevents bowing.

Build the Basic Bed Frame

The first step toward building this Murphy bed is to make a frame to hold a full-sized mattress. It consists of a large inner frame, a two-piece plywood face panel, and four bed rails (*Bed Frame Assembly*, below).

Build the Inner Frame—The inner frame construction is simple. It's composed of five L-shaped struts held in place by two frame sides (*Bed Frame Detail*). Begin by cutting ten strut pieces (A) to size and then glue them into their L-shaped configurations. Then cut the frame sides (B) to size, and screw them to the struts.

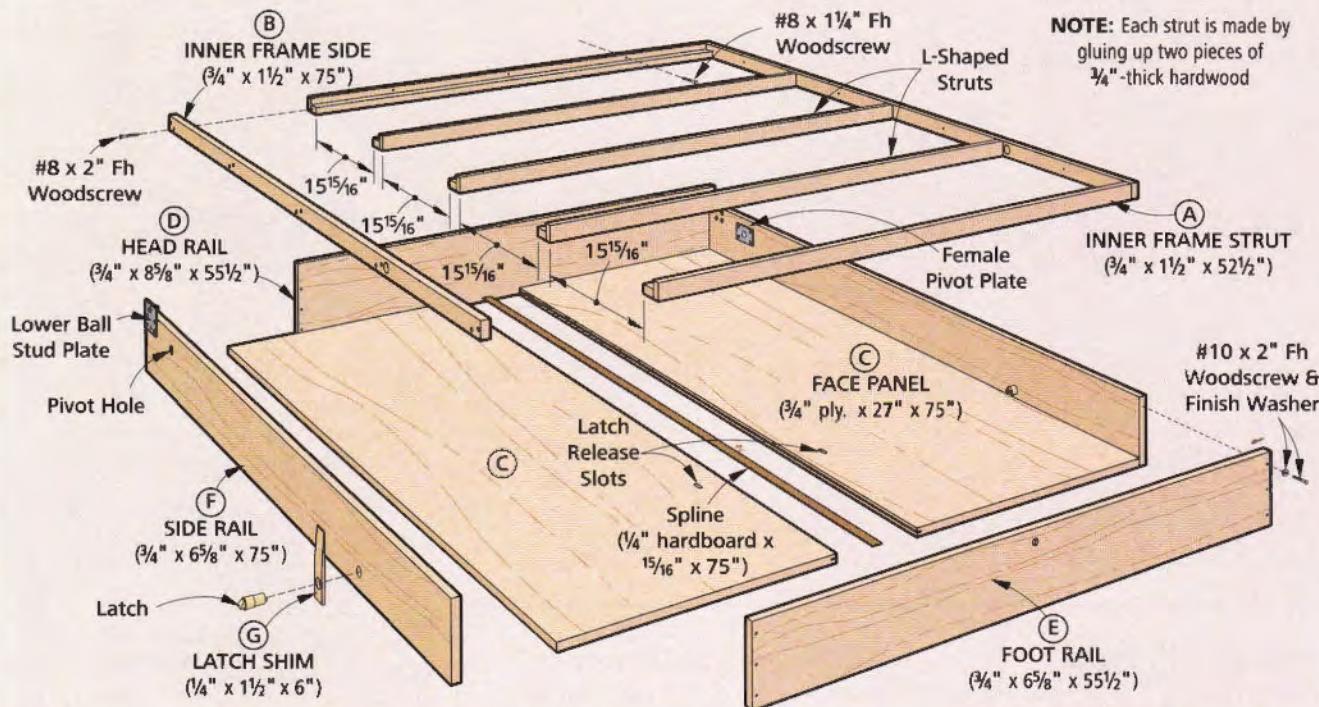
Add the Face Panel—With the inner frame complete, you can focus on the plywood face panel. This is the bottom of the bed frame, which means

it's the "show" face of the bed when folded up in the cabinet.

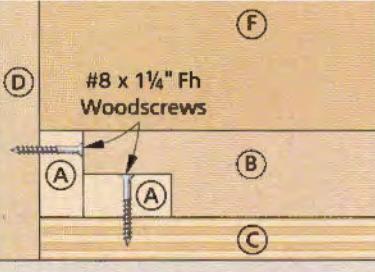
The face panel is wider than a sheet of plywood, so it's made by edge-gluing two panels (C) together. To align these panels during glue-up, I used a $\frac{1}{4}$ " hardboard spline that fits into a slot in the inner edge of each piece (*Spline Detail*). A handheld router and a $\frac{1}{4}$ " slot-cutting bit make quick work of cutting this slot.

Before gluing up the face panel, there's one last detail to attend to. That's cutting a small slot in each panel for a nylon strap, which is part of the latch release mechanism (*Slot Detail*). I used a plunge router with an edge guide, and then routed the slots with a $\frac{3}{8}$ " spiral bit. Then I sanded

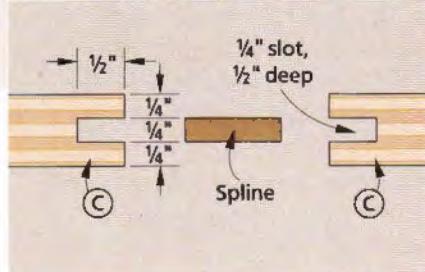
BED FRAME ASSEMBLY



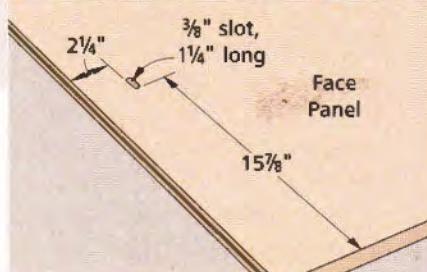
BED FRAME DETAIL



SPLINE DETAIL



LATCH RELEASE SLOT DETAIL



the edges of the slots to keep the strap from fraying.

Now you're ready to glue the panels together. Once you've rounded up the long clamps you'll need for this glue-up, brush glue into the slots, insert the spline, and clamp the face panel together (*Photo, page 84*).

Face Panels—When the glue dries, attach the face panels to the inner frame. To do this, set the face panels on a flat surface with their "show" sides down. Then attach the frame with glue and screws (*Bed Frame Detail*).

Make Bed Frame Rails—The next step is to surround the inner frame and face panel with four bed rails made from $\frac{3}{4}$ "-thick maple. Cut the head rail (D), foot rail (E), and side rails (F) to size.

Add Latch Shims—If you look at the *Side Rail Assembly* below, you'll see there's a latch shim (G) attached to each side rail. This wood shim ensures

the proper spacing between the bed frame and the wall cabinet, which allows the latch to operate.

The latch shim is a thin strip of hardwood that tapers toward one end. Drill a hole in the shim to accept the latch. Then sand the taper using a belt/disk sander. The shim is simply glued to the side rail. Once the glue dries, take the side rail to the drill press and extend the hole in the shim through the rail.

Now you're ready to start mounting the hardware that makes this Murphy bed operate. In particular, you'll be mounting a female pivot plate and a lower ball stud plate to each side rail. One thing to be aware of here is that the side rails are mirror images of each other. So you'll want to label the inside and outside faces of each rail to make sure the hardware gets mounted on the correct side.

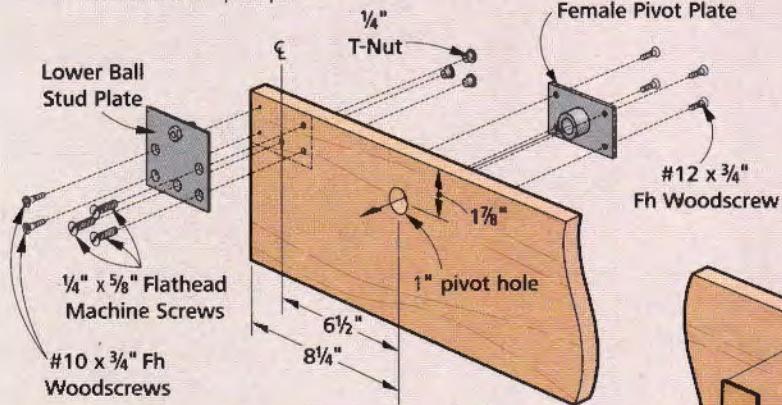
Next, follow the step-by-step installation process detailed in the *Illustration* below to mount the hardware. You'll need to drill a hole to accept the female pivot plate. Also, it's important to install the ball stud plate so the stud is $\frac{5}{16}$ " above the top of the rail (*Ball Stud Detail*). This will allow clearance for the piston to snap onto the stud. A spacer ensures proper clearance.

Attach the Bed Rails—Now attach the rails with glue and screws. The side rails go on first. Align these so they're flush with the inner frame on the ends, and drive screws through the inner frame and into the side rails. Then attach the head and foot rails to the side rails with screws and finish washers.

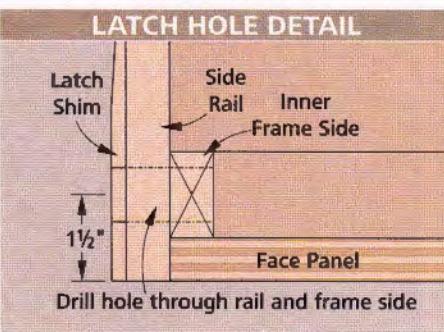
Finally, extend the latch hole that you drilled in the shim and side rail through the inner frame (*Latch Hole Detail*). Just chuck a Forstner bit in a portable drill, and drill the hole.

SIDE RAIL ASSEMBLY

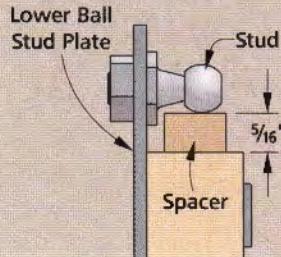
FIRST: Lay out and drill hole, then install female pivot plate



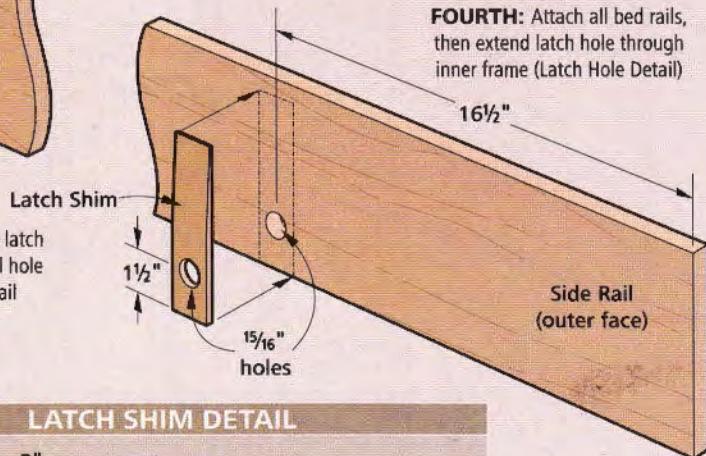
SECOND: Locate centerline of ball stud plate $6\frac{1}{2}$ " from pivot hole, then attach as shown (Ball Stud Detail)



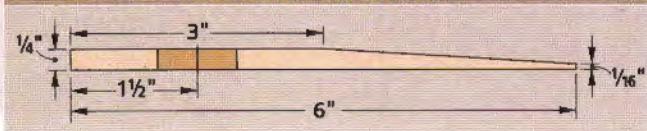
BALL STUD DETAIL



THIRD: Glue on latch shim, then extend hole through side rail



LATCH SHIM DETAIL





A leg assembly pivots down from the frame to support the bed during use.

Decorative Face & Flip-Down Leg

As I mentioned before, the face panel of the bed frame is the "show" side of this Murphy bed. So to make it as attractive as possible, I applied decorative trim pieces to the face panel. One of these trim pieces is also functional. It's part of a leg assembly that sits flat on top of the bed frame when it's folded up, and then swings down for support when you pull the bed out of the cabinet (*see Photo at left*).

The trim pieces, including the leg assembly, are all made from $\frac{3}{4}$ "-thick hardwood. They're attached in three phases. First, a lower face frame is applied as a single unit. Then two upper stiles are added. Finally, the pivoting leg assembly is connected to the stiles.

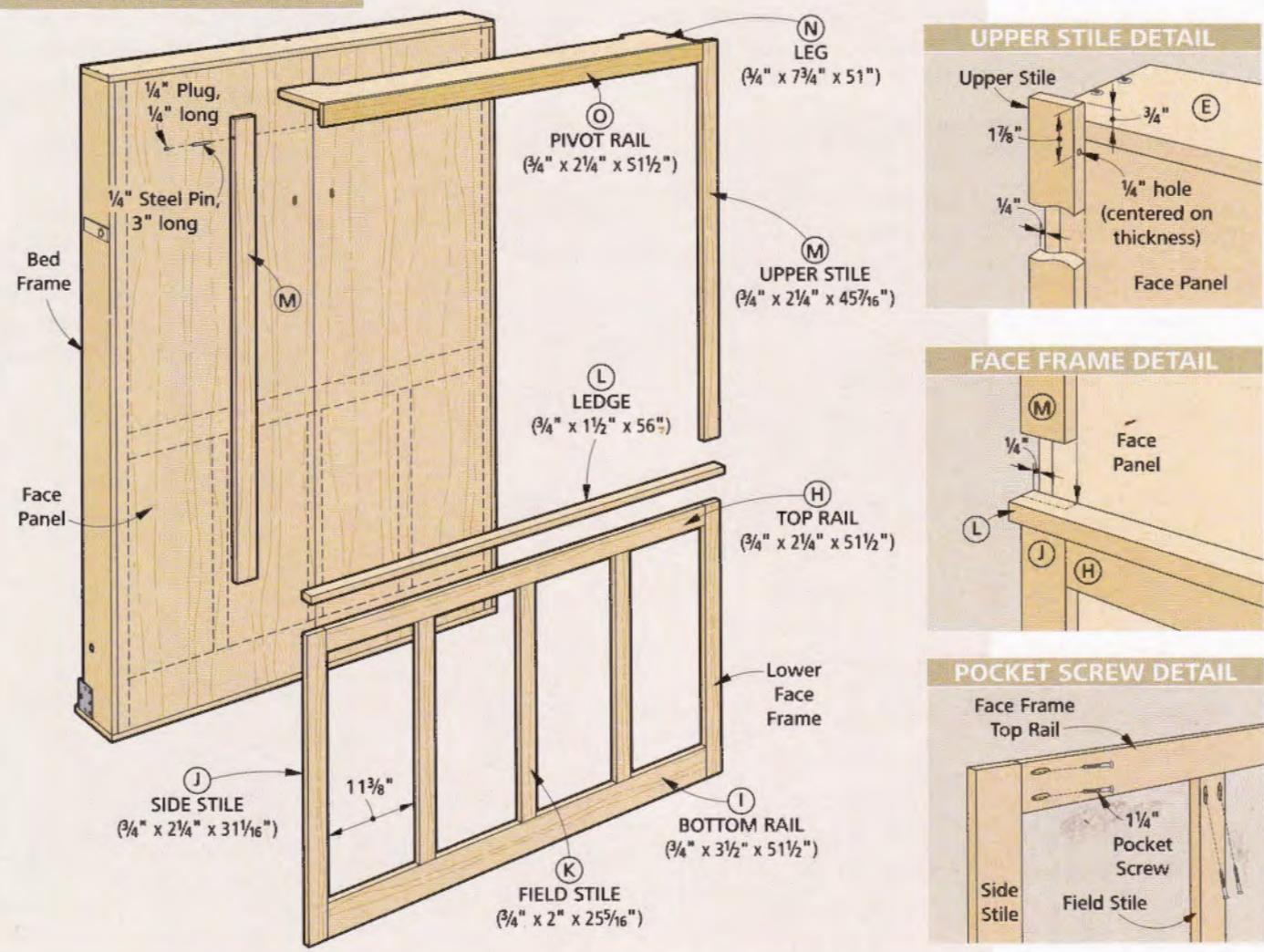
Build the Lower Face Frame

The lower face frame is sized to overhang the bed frame by $\frac{1}{4}$ " on each side (*Face Frame Detail*). With that in mind, start by cutting the top and bottom rails (H, I) and side stiles (J) of the face frame. Then drill pocket holes in the rails, and assemble the frame (*Pocket Screw Detail*). Now cut the field stiles (K) to fit between the rails, and attach them with pocket screws.

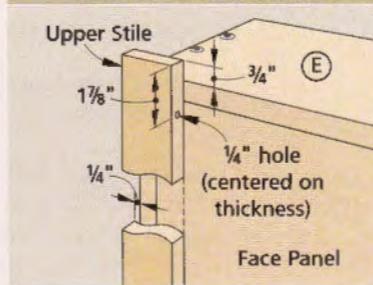
The final piece of the lower face frame is a hardwood ledge (L). Simply cut this ledge to size, and then glue and clamp it to the top rail.

At this point, you're ready to attach the face frame. To do this, glue and clamp it in place, taking care to maintain that $\frac{1}{4}$ " overhang on each side.

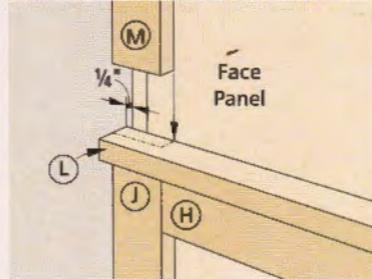
BED FRAME ASSEMBLY



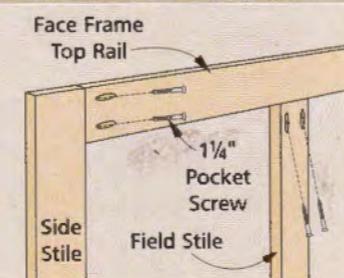
UPPER STILE DETAIL



FACE FRAME DETAIL



POCKET SCREW DETAIL



SUPPORT LEG ASSEMBLY

The Upper Stiles—The upper stiles (M) are next. When the bed is complete, the support leg will pivot on steel pins that connect the leg assembly to the upper stiles. You'll install those pins later, but you need to make accommodations for them now.

To do that, you'll need to drill a $\frac{1}{4}$ " hole through each upper stile for the pin (*Upper Stile Detail*). Carefully lay out the location of each hole, and then drill it at the drill press.

Next, glue and clamp the stiles to the face panel. First, make sure that both stiles overhang the same amount ($\frac{1}{4}$ ") as the lower face frame. Then measure between the stiles at the top and bottom to be sure they're parallel.

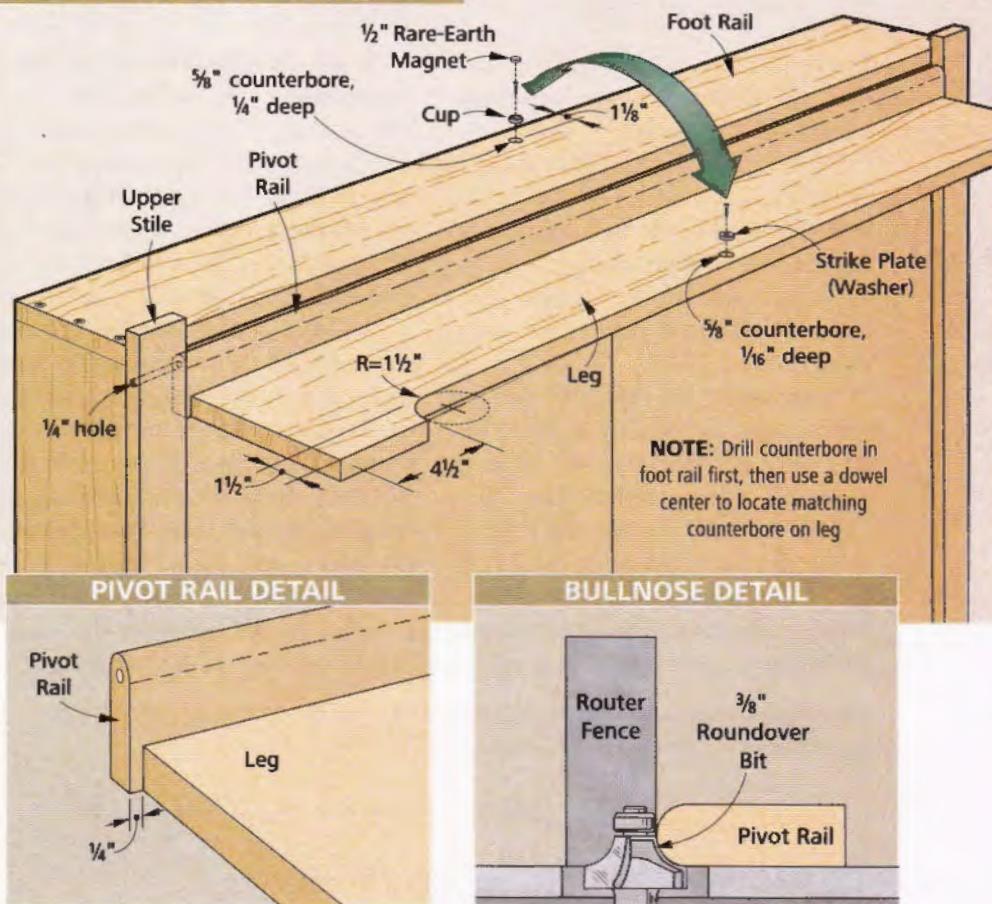
A Leg for Support—Despite its "pivotal" role in supporting the bed, the leg assembly is still a simple build. It's comprised of two pieces: the leg itself and a pivot rail (*see Support Leg Assembly, right*).

Start by cutting the leg (N) to size. Then lay out and cut the curved "lift" with a jig saw.

Before cutting the pivot rail (O) to size, note that it's $\frac{1}{2}$ " longer than the leg, which creates a $\frac{1}{4}$ " overhang on each side (*Pivot Rail Detail*). This provides clearance to keep the leg from rubbing against the stiles.

For a similar reason, you'll need to rout a bullnose profile on one edge of the pivot rail (*Bullnose Detail*). This profile allows the leg assembly to pivot freely without binding against the bed frame. After shaping the edge of the pivot rail on the router table, simply glue and clamp it to the leg.

Attach the Leg—In order to mount the support leg assembly using the pivot pins, you'll need to drill holes in the pivot rail that align with those in the upper stiles. To do this, position the leg assembly between the stiles, and temporarily clamp it to the bed frame. Then, using the holes in the



stiles as a guide, drill the holes in the pivot rail (*Fig. 1, below*). Tap the pins through the stiles and into the pivot rail (*Fig. 2*). Finally, glue in wood plugs to conceal the holes.

Magnetic Catch—To keep the support leg from swinging out when lowering the bed, I added a magnetic catch to the foot rail. It's a rare-earth cup magnet and a strike plate (washer). These fit into shallow pockets that are

formed by drilling counterbores in the foot rail and leg (*Support Leg Assembly*).

An easy way to align these holes is with a dowel center, which is a metal pin that you insert into a dowel hole. On the bed, drill a counterbore in the foot rail. Then insert the dowel center, and close the leg against the foot rail to mark the location of the strike plate. To finish, drill the counterbore in the leg, and install the strike plate.

FIGURE 1

FIRST: Clamp leg assembly to bed frame in its closed position

SECOND: Use through-hole in upper stile as guide when drilling hole in pivot rail

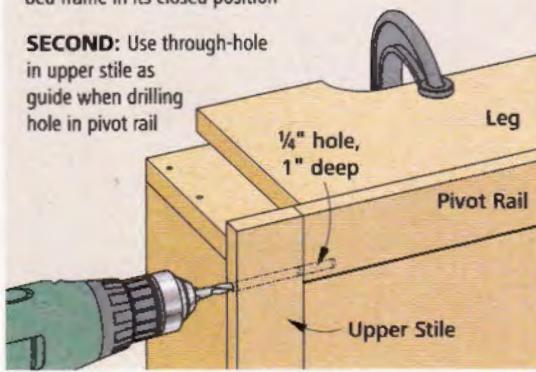
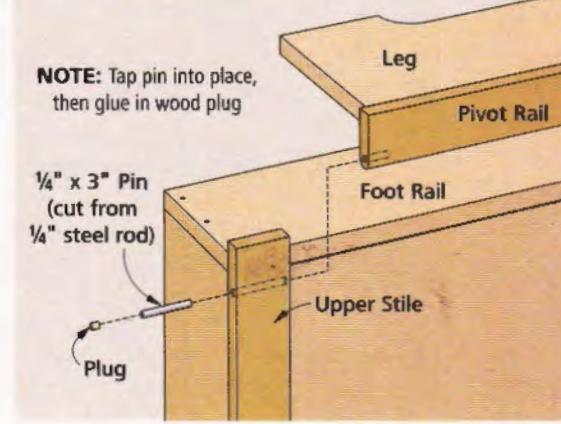


FIGURE 2

NOTE: Tap pin into place, then glue in wood plug

1/4" x 3" Pin
(cut from
1/4" steel rod)

Plug



Build A Cabinet to House the Bed

The bed frame is housed in a large wall-mounted cabinet that's open in front and back (*Cabinet Assembly*).

What's unusual about this cabinet is that it must be assembled around the bed frame because of how the pivot plates in the hardware kit fit together. You can make the cabinet parts in your shop, but you'll need to assemble them as you install the bed.

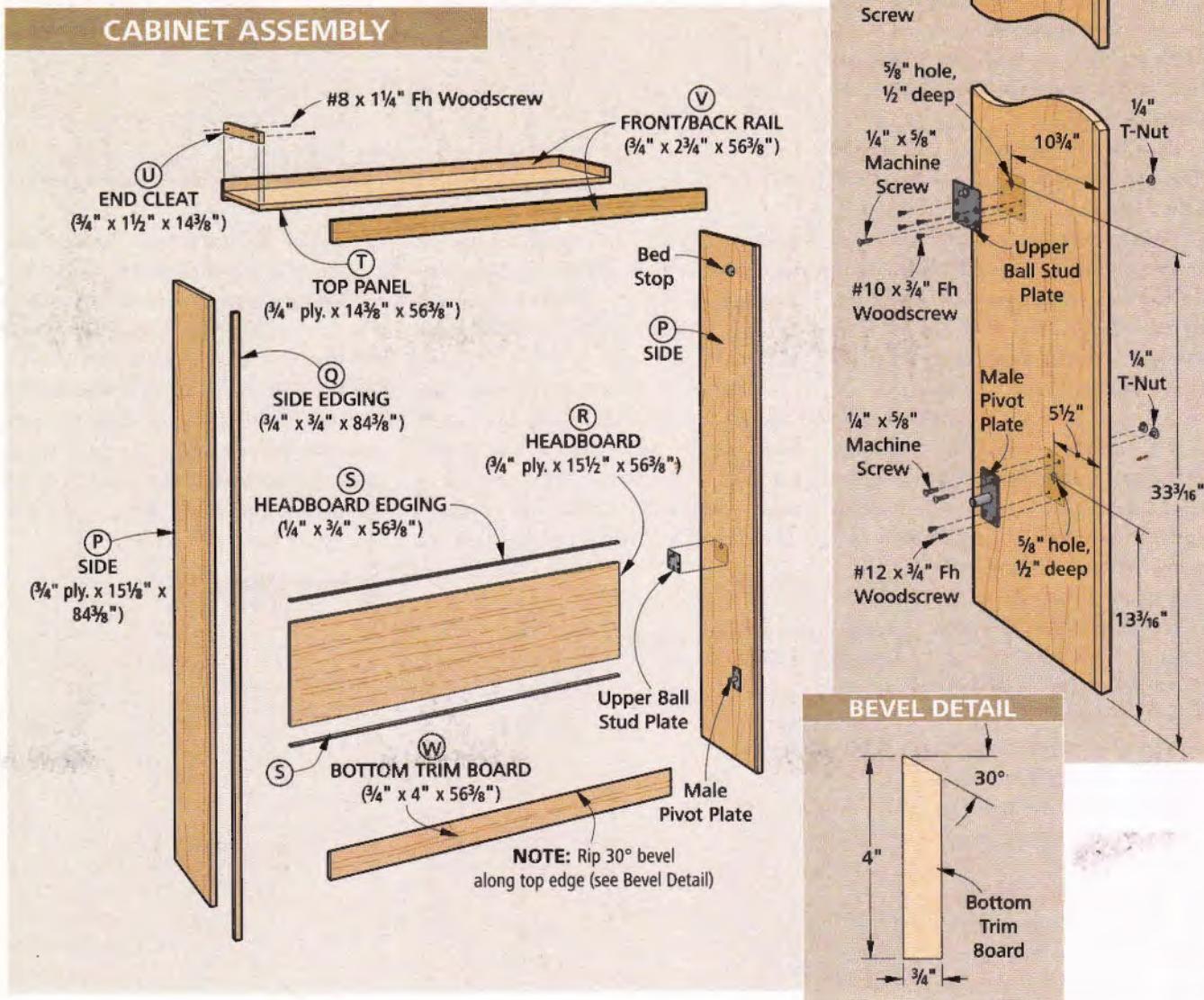
Start with the Sides—The first step is to cut the sides (P) to size. Then glue long edging strips of $\frac{3}{4}$ "-thick hardwood edging (Q) to the front edge of each side to cover the exposed plywood. Now it's time to mount the rest of the bed hardware. This includes the male pivot plates, the upper ball stud plates, and a pair of stops (*Side Detail*).

You'll need to drill three holes in the inside face of each side to accept this hardware. The cabinet sides are mirror images of each other, so be sure to label the inside and outside faces to avoid getting them mixed up. Then drill the holes and mount the hardware as shown.

Build a Headboard—The next step is to add the headboard (R). Like the sides, it's a $\frac{3}{4}$ " plywood panel with hardwood edging (S) on the top and bottom. This time, however, I used $\frac{1}{4}$ "-thick strips to help conceal the long, horizontal joint lines between the edging and the headboard. Then, to simplify the assembly process later, I drilled pocket holes for the screws in the back face of the headboard.

Topping It Off—The cabinet top comes next. It consists of a $\frac{3}{4}$ " plywood top panel with hardwood end cleats (U) and rails (V). The end cleats are narrower than the rails. To build the top, glue the end cleats to the top panel, making sure they're flush with the front and back edges. Then glue on the rails, so they're flush with the outside faces of the cleats.

Bottom Trim Board—The final piece is a bottom trim board (W). A



bevel on the top edge of the board creates clearance for the bed frame to swing in and out. Rip this bevel on the table saw. Then drill pocket holes in the back face that will be used to secure the trim board to the cabinet.

Apply the Finish—Before moving the bed from the shop to the room where it's going to be installed, you'll want to apply the finish. Since the face panel of this bed is so large, you may want to use the finish to "break" it up a bit. To help disguise the bed, I decided to use clear finish on the lower part of the panel, the face frame, and the upper trim boards. Then I painted the upper part of the panel to match the walls and create contrast with this clear finish.

Prepare for Installation—Once the finish is dry, move the bed pieces into the room. An extra set of hands will be useful here, so round up a helper, too. Now position the bed frame with the face panel down and the foot rail facing the wall that the bed will be mounted on. Prop the frame off the floor with boards to keep it from teetering on the ledge of the face frame (*Assembling the Bed, below*).

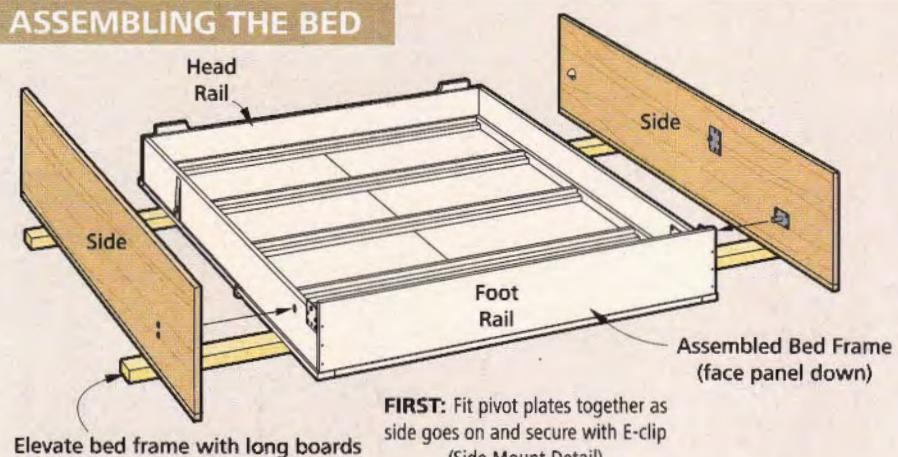
Assemble the Cabinet—Now you're ready to assemble the Murphy bed. The cabinet sides mount to the bed frame first. To accomplish this, fit the rod in the pivot plate on each side into the pivot plate in the bed frame (*Side Mount Detail*). Then snap the E-clip (included in the bed kit) over the rod.



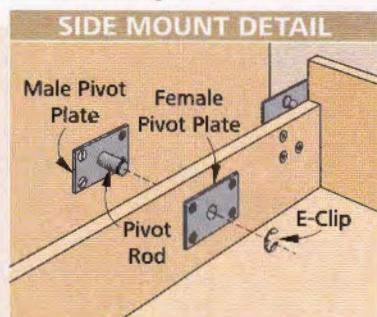
Snap an E-clip over the pivot rod to connect the sides of the cabinet to the bed frame.

Next, attach the top by driving screws through the end cleats into the sides (*Top Mount Detail*). Then mount the headboard between the sides with pocket screws (*Headboard Detail*). Finally, clamp the bottom trim board in place, and attach it with pocket screws.

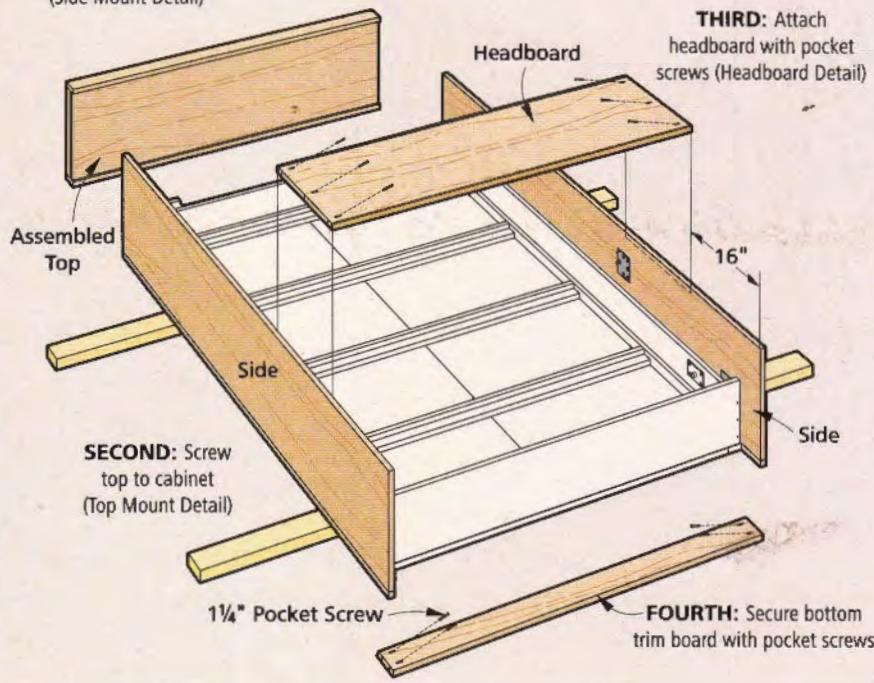
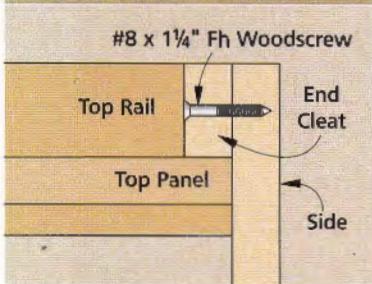
ASSEMBLING THE BED



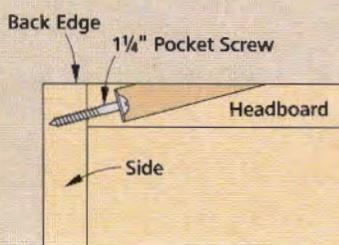
FIRST: Fit pivot plates together as side goes on and secure with E-clip (*Side Mount Detail*)



TOP MOUNT DETAIL



HEADBOARD DETAIL



Installing the Bed & Final Details

For the installation of the Murphy bed, you'll need to get a helper to assist you in raising the assembly to an upright position. Do this just a few feet away from the wall the bed will occupy.

Install the Pistons—To help control the bed's descent, install the hydraulic pistons. The ends of these pistons snap onto the ball studs on the bed frame and cabinet sides. You will not be able to manually compress the pistons to fit, so you'll have to arrange the bed to fit the piston. To do this, temporarily remove the bed stops you installed earlier. This lets you tilt the frame into the cabinet, so the ball studs

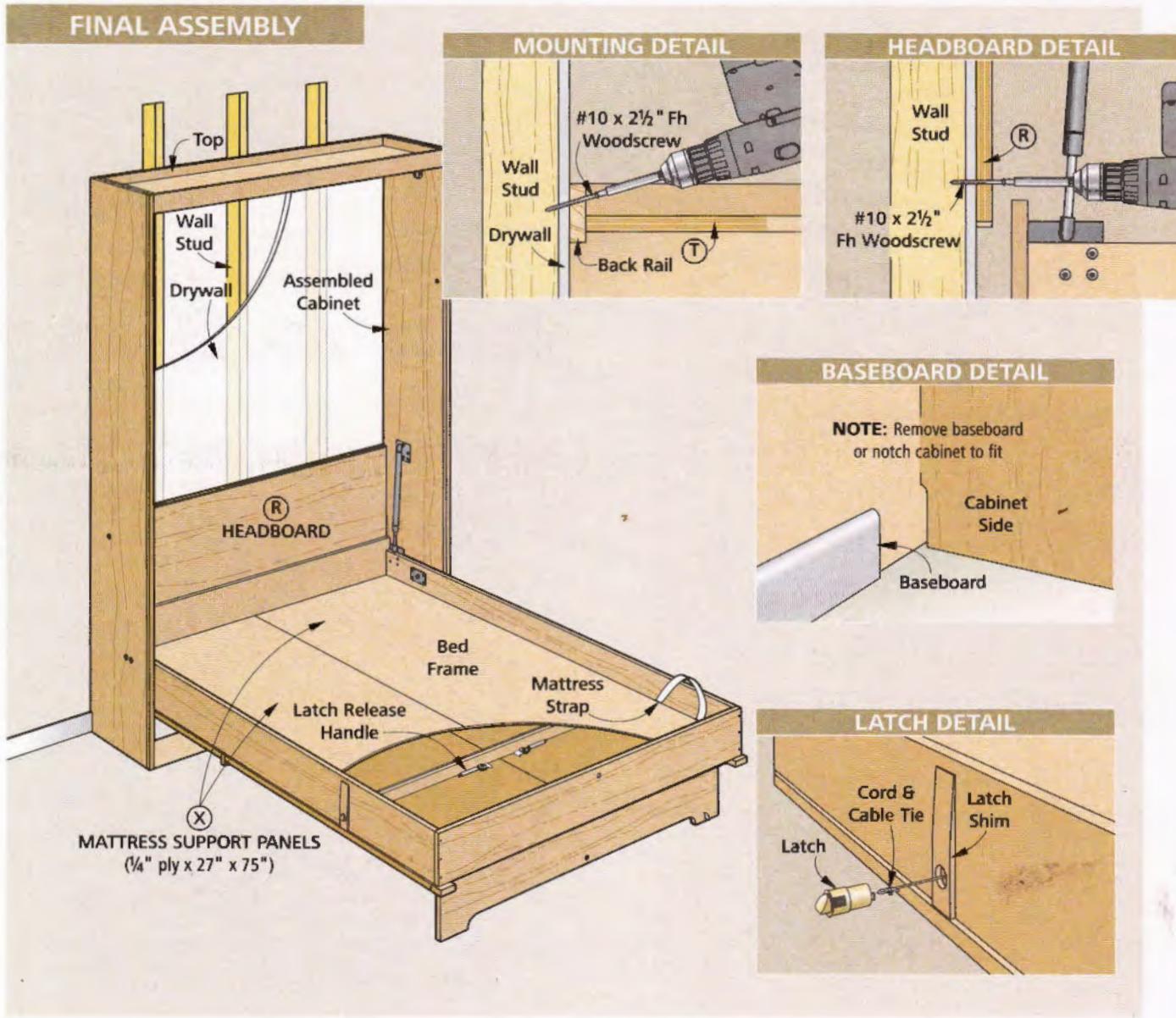
are the right distance apart. (Three inches of inward tilt is all it takes.) Simply stand behind the cabinet, orient each piston with the indicated end up, and snap the ends into place over the ball studs. Then reinstall the stops.

Mounting the Bed—Before mounting the bed, you'll need to either remove the baseboard from the wall, or scribe the cabinet to fit around it.

Now set the bed against the wall, and check it for plumb. Once finished, drive screws through the back rail and into wall studs. Then you'll need to lower the bed frame and drive screws through the headboard and into the studs.

Installing the Latches—Next, install the spring-loaded latches that come with the hardware kit. Push each one into the hole in the shim on the side of the bed. They should sit flush with the face of the shim.

At this point, you'll need to make a handle to release the latches and pull down the bed (*Latch Release Handle Assembly*, right). This assembly starts with a nylon strap that threads through the slots in the face panel. Then the strap connects to the latches with a pair of washers, a spring, and a cord. The washers are attached to the strap with epoxy and a machine screw, and the

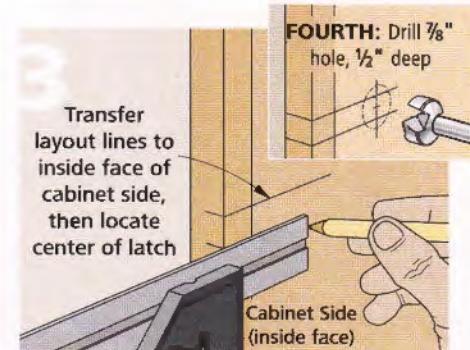
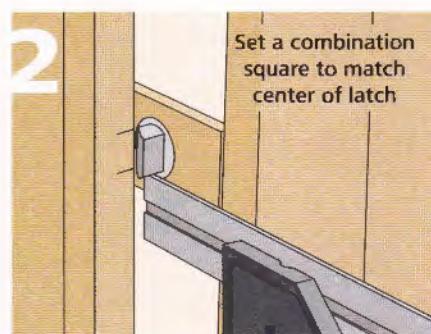
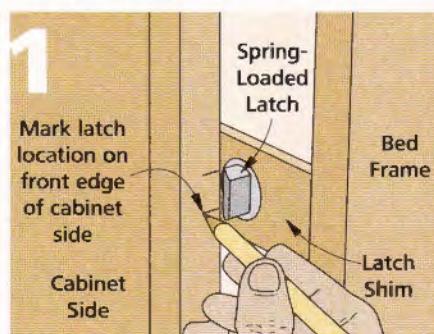


spring threads through holes drilled in the washers. Finally, a cord and cable tie connect the spring to the latch.

Drill Latch Catches—Assemble the handles as shown in the *Illustration* at right. The latches rest in holes in the cabinet sides that secure the bed. These catches are easy to locate and drill by following the sequence shown in *Figures 1-3* below.

Final Details—Finally, cut two $\frac{1}{4}$ " plywood support panels (X) for the mattress, and then set them in the bed frame. Then attach the mattress straps (from the bed kit) to the frame sides. Now set the mattress in place, and your spare bedroom is ready for guests.

INSTALLING THE LATCH



MATERIAL LIST

Part	Qty	Size	Material
BED FRAME			
A	FRAME STRUTS	10	$\frac{3}{4}$ " x $1\frac{1}{2}$ " x $52\frac{1}{2}$ "
B	FRAME SIDES	2	$\frac{3}{4}$ " x $1\frac{1}{2}$ " x $75"$
C	FACE PANELS	2	$\frac{3}{4}$ " x $27"$ x $75"$
D	HEAD RAIL	1	$\frac{3}{4}$ " x $8\frac{5}{8}$ " x $55\frac{1}{2}$ "
E	FOOT RAIL	1	$\frac{3}{4}$ " x $6\frac{5}{8}$ " x $55\frac{1}{2}$ "
F	SIDE RAILS	2	$\frac{3}{4}$ " x $6\frac{5}{8}$ " x $75"$
G	SHIMS	2	$\frac{1}{4}$ " x $1\frac{1}{2}$ " x $6"$
H	TOP RAIL	1	$\frac{3}{4}$ " x $2\frac{1}{4}$ " x $51\frac{1}{2}$ "
I	BOTTOM RAIL	1	$\frac{3}{4}$ " x $3\frac{1}{2}$ " x $51\frac{1}{2}$ "
J	SIDE STILES	2	$\frac{3}{4}$ " x $2\frac{1}{4}$ " x $31\frac{1}{16}$ "
K	FIELD STILES	3	$\frac{3}{4}$ " x $2"$ x $25\frac{5}{16}$ "
L	FRAME LEDGE	1	$\frac{3}{4}$ " x $1\frac{1}{2}$ " x $56"$
M	TRIM STILES	2	$\frac{3}{4}$ " x $2\frac{1}{4}$ " x $45\frac{7}{16}$ "
N	LEG	1	$\frac{3}{4}"$ x $7\frac{3}{4}$ " x $51"$
O	PIVOT RAIL	1	$\frac{3}{4}$ " x $2\frac{1}{4}$ " x $51\frac{1}{2}$ "
CABINET			
P	SIDES	2	$\frac{3}{4}$ " x $15\frac{1}{8}$ " x $84\frac{3}{8}$ "
Q	SIDE EDGING	2	$\frac{3}{4}$ " x $\frac{3}{4}$ " x $84\frac{3}{8}$ "

Part	Qty	Size	Material
R	HEADBOARD	1	Maple Plywood
S	HDBD. EDGING	2	Maple
T	TOP PANEL	1	Maple Plywood
U	END CLEATS	2	Maple
V	FRT./BK. RAILS	2	Maple
W	BOTTOM TRIM	1	Maple
X	SUPPORT PANELS	2	Maple Plywood

HARDWARE:

- (1) Create-a-bed Hardware Kit *
- (12) #10 x 2" Fh Woodscrews & Finish Washers
- (1) $1\frac{1}{2}$ " Rare-Earth Magnet, Cup & Washer
- (2) $1\frac{1}{4}$ " Steel Pin, 3" long
- (4) $\frac{3}{16}$ " Fender Washers ($\frac{1}{4}$ " O.D.)
- (2) $\frac{3}{16}$ " Roundhead Metal Screws
- (2) #42 Servalite Springs
- (1) 1"-wide Nylon Strap, 10" long
- (20) #8 x 2" Fh Woodscrews
- (18) #10 x $1\frac{1}{4}$ " Fh Woodscrews
- (30) $1\frac{1}{4}$ " Pocket Screws
- (6) #10 x $2\frac{1}{2}$ " Fh Woodscrews

* Item available from WallBed.com; 877-966-3852



bedroom closet . organizer

Everyone can use more closet space. This great-looking organizer is the perfect way to get it without remodeling.

Most closets don't suffer from a lack of space, but rather an inefficient use of space. That's what makes this closet organizer so intriguing. It's designed to make better use of what you already have.

To do this, the organizer eliminates the overhead shelf and uses that extra space for a pair of roll-out storage bins at the bottom of the closet. The additional height provides clearance for a tall storage tower supported by a sturdy shelf that spans the length of the closet.

To make the storage space even more versatile, the tower is divided into compartments used either as shelves or to hold drawers. The tower also provides support for three closet rods. See the following pages for all the details of building the organizer.

CONSTRUCTION VIEW

NOTE: This closet organizer is designed to fit inside an 8 ft.-tall x 8 ft.-wide closet

2x2 Cleats
screwed to wall
studs support
the base shelf

Closet Rods
for hanging
shorter
items

Sides of Tower
are built with
strong, lightweight
torsion panels

1x4 Core Pieces
provide the framework
for the torsion panels
that form the sides
of the tower

2x4 Core Pieces
provide a framework
for the torsion panel
that forms the
base shelf

Hardwood Edging
covers core pieces
and exposed plies
of skin

Large Roll-out Bin
holds bulky items

Storage
Tower

Closet Rod
for hanging
long garments

Adjustable Shelves
can be left open or
used to hold drawers

Drawers
assembled
with rabbet joints
and screws

Base Shelf

Storage Bins

Stainless Steel
Bar Handle

2" Swivel
Caster

MATERIAL LIST

Part	Qty	Size	Material
CLOSET ORGANIZER			
A	1	1½" x 3½" x 23 lin. ft.*	Pine
B	2	¼" x 22½" x 94"	Cherry Plywood
C	1	¾" x 1⅓" x 94"	Cherry
D	1	¾" x 3½" x 46 lin. ft.*	Pine
E	4	¼" x 19" x 75"	Cherry Plywood
F	1	¼" x 16" x 75"	Cherry Plywood
G	2	¾" x 1⅓" x 75"	Cherry
H	2	¾" x 17¼" x 16"	Cherry Plywood
I	2	¾" x ¾" x 16"	Cherry
J	8	¾" x 17¼" x 15½"	Cherry Plywood
K	8	¾" x ¾" x 15½"	Cherry
L	8	¾" x 7" x 15¾"	Cherry Plywood
M	8	¾" x 7" x 17½"	Cherry Plywood
N	4	¾" x 9½" x 29¾"	Cherry Plywood

Part	Qty	Size	Material
O	BIN SIDES	4	¾" x 9½" x 19½"
P	DRWR/BIN EDGING	1	½" x ¾" x 54 lin. ft.*
Q	DRAWER BTMS.	4	¾" x 14½" x 17"
R	BIN BOTTOMS	2	¼" x 29" x 19"
S	CASTER SPACERS	8	½" x 3" x 3"
T	CLEATS	3	2" x 2", cut to fit

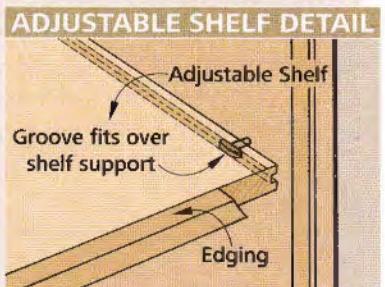
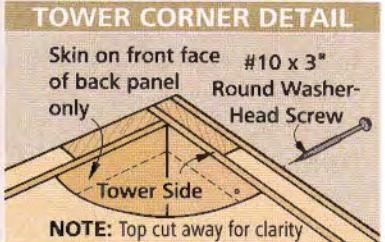
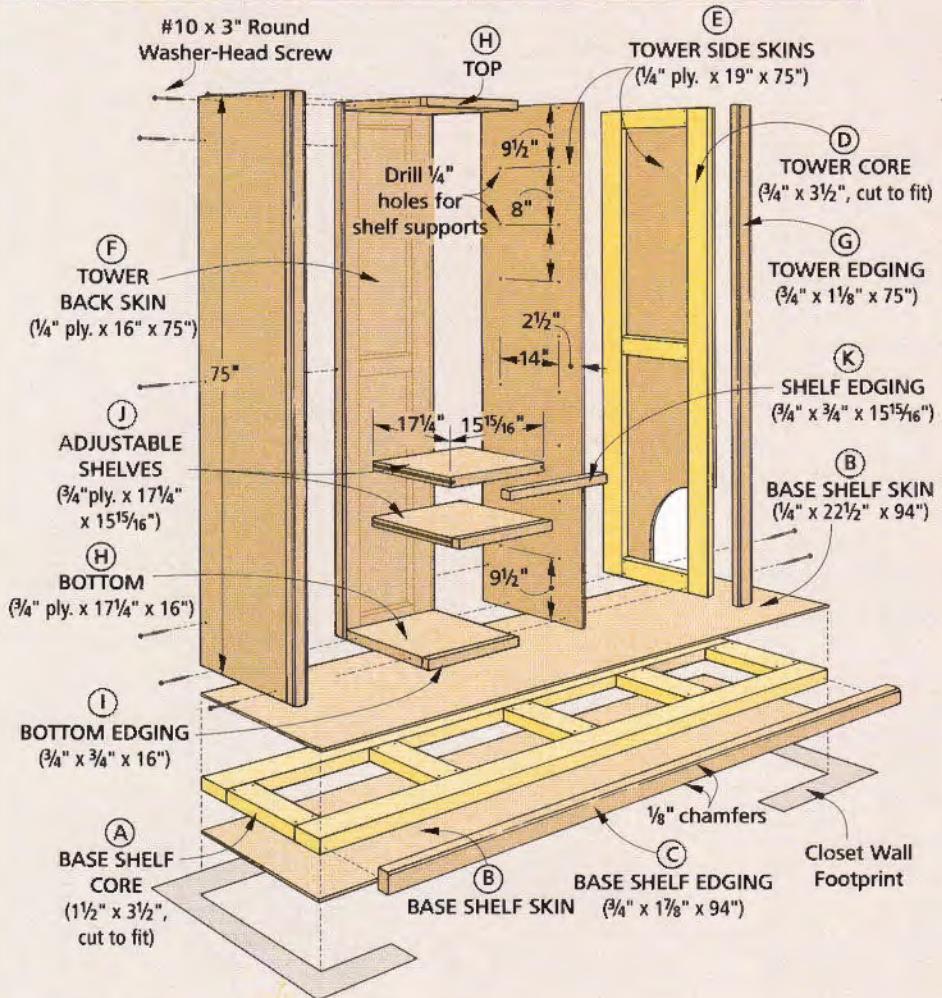
* Includes extra for waste

HARDWARE:

- (31) #10 x 3" Round Washer Head Screws
- (72) #8 x 1½" Fh Woodscrews
- (16) #8 x ½" Sheet Metal Screws
- (4) Stainless Steel Bar Handles (7/8") w/ Mounting Bolts*
- (2) Stainless Steel Bar Handles (12²/₃") w/ Mounting Bolts*
- (32) Low Profile Shelf Supports
- (8) 2" Swivel Casters
- (3) Closet Rods with Supports and Screws
- 1" Brads

* Items available from LeeValley.com; 800-871-8158

BASE SHELF & TOWER ASSEMBLY VIEW



NOTE: To determine the length of the base shelf, measure inside dimension of closet between the end walls, then subtract $\frac{1}{4}$ " to allow for clearance

Build the Organizer Components

At the heart of this closet organizer is a wide base shelf and a narrow, tall storage tower (*Assembly View*). The base shelf and tower are both built with torsion panels.

Base Shelf Comes First—The base shelf is the first of the torsion panels that make up this project. It spans the length of the closet. To make it easier to fit the shelf into the closet, allow for some clearance at each end.

The base shelf also supports the weight of the tower. That's why I "beefed up" this torsion panel by using 2x stock for the core pieces (A). To complete the panel, glue $\frac{1}{4}$ " cherry plywood skins (B) to the faces.

To cover the exposed edges of the core pieces, the next step is to apply hardwood edging (C) to the front

of the shelf. After gluing this edging in place, ease the edges by routing a slight chamfer along the top and bottom of them.

Build a Storage Tower—The storage tower is made up of three torsion panels. These panels are thinner than the base shelf, which gives the tower a "lighter" look. To create this slim profile, I used 1x stock for the core pieces (D). Like the base shelf, $\frac{1}{4}$ " cherry plywood skins cover all of the core pieces.

The skins (E) cover both faces of the side panels. But because the back panel sits against the closet wall, I glued a single skin (F) to the front only of this panel.

Edging—As with the base shelf, apply edging (G) to the side panels, but only to the front edges. There's

no need to cover the back edges since they won't be visible. For the same reason, the back panel has no edging at all (*Tower Corner Detail*).

Shelf Support Holes—After gluing the edging in place, I drilled a series of $\frac{1}{4}$ " holes in the side panels for the shelf supports. Note the locations of these holes in the *Assembly View*.

Now that all the torsion panels are completed, there's one more thing to do before assembling the tower, and that's to make the top and bottom (H). Each is a piece of $\frac{3}{4}$ " plywood with hardwood edging (I) covering the front edge.

Tower Assembly—Now it's just a matter of assembling the storage tower. It's a large unit, but it should go together easily because it's held together with screws.

Of course, this means that the screw heads will be visible once it's assembled. So for appearance, I used "washer-head" screws. One thing you won't have to worry about when assembling the tower is the panels flexing or twisting. (The rigidity of the torsion panels takes care of that.) However, you need to be sure to pre-drill the holes for the screws. With that in mind, go ahead and assemble the tower.

Add Adjustable Shelves—With the tower together, you can shift your focus to the adjustable shelves. In addition to providing storage, these shelves form the openings for drawers.

Like the top and bottom, the shelves (J) are made of $\frac{3}{4}$ " plywood. But there are two differences worth noting. First, they're $\frac{1}{16}$ " narrower, so you can slide them in and out. Second, they have a groove in each end that fits over the low-profile shelf supports I used.

Cut Grooves—The table saw makes quick work of cutting the grooves. You'll need to stand each shelf on edge as you make the cut. To keep the shelf from tipping, attach a tall auxiliary fence to the rip fence.

Edging—Don't worry about the part of the groove that's exposed on each of the shelves. It will be covered up by the hardwood edging (K) that gets applied to the shelf.

Drawers and Storage Bins—The compartments in the storage tower can be used either as open shelves or to hold drawers. I built four drawers and added a couple of large rolling bins under the base shelf (Illustration, right).

Although different in size, the construction is the same for the drawers and bins. They're made from $\frac{3}{4}$ " cherry plywood, banded with thin strips of solid wood, and assembled with rabbet joints and screws (Illustration, right).

Size Considerations—The bins are sized so they can sit side by side and be pulled out without hitting the closet doors. (This assumes a standard 6 ft.-wide opening.) As for the drawers, they're sized to fit the openings in the tower, allowing for $\frac{1}{16}$ " clearance on each side and about $\frac{1}{8}$ " on top.

The first step in making the drawers and bins is to cut the fronts, backs (L,

N) and sides (M, O) to size. Note that the fronts and backs are edged all the way around. For the sides, though, only the top and bottom edges are covered. The ends fit into the rabbets in the front and back, so they can be left bare.

As you can see, there's a lot of edge-banding (P) to apply here. Once it's glued on, cut the rabbets in the front and back pieces to hold the sides. Then, after cutting a groove for the bottoms (Q, R), assemble the drawers and bins with glue and screws.

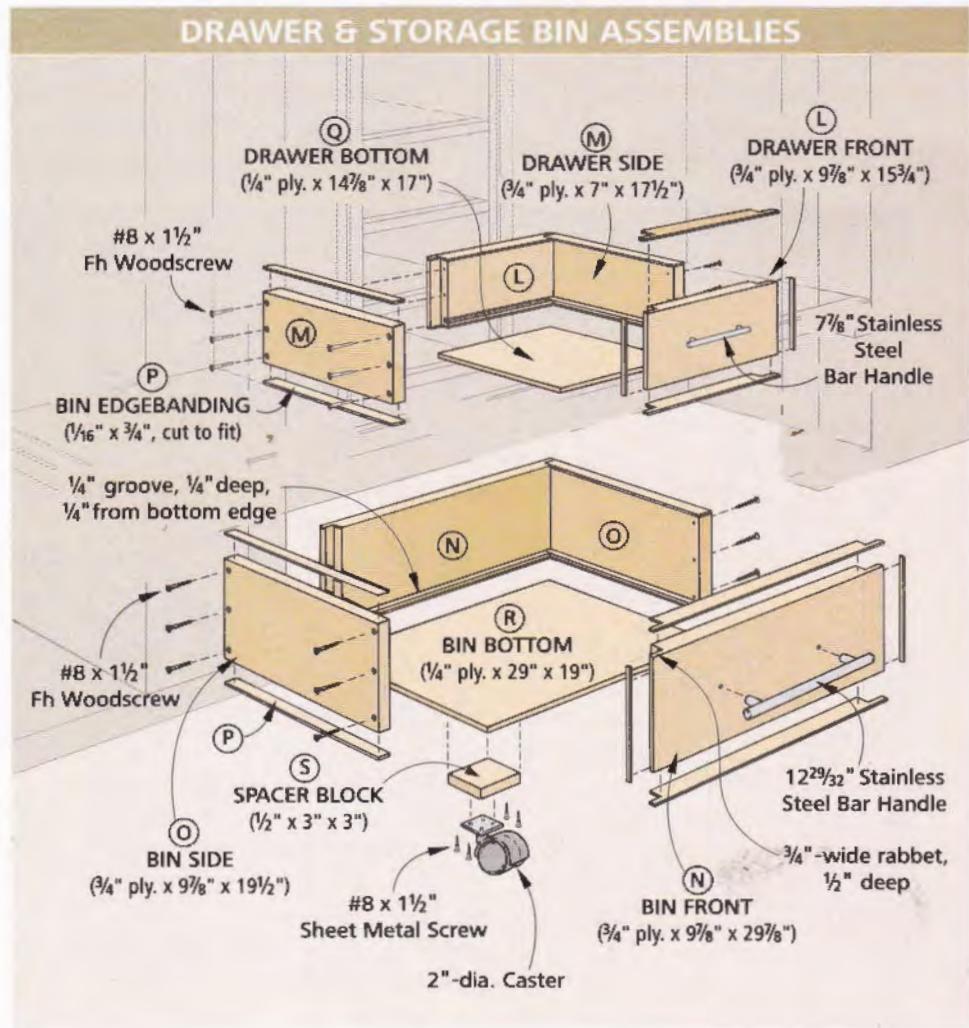
Complete the Final Touches—I wanted the drawers and bins to have a contemporary look, so I installed stainless steel bar handles on the drawer and bin fronts. Then a set of swivel casters completes the bins and makes it easy to roll them out from underneath the base shelf. Screw the casters to some small spacer blocks (S) first. These blocks then get glued to the bottom of the bins.



The drawers slide in and out on the adjustable shelves that form the openings in the storage tower.



The two rolling storage bins that fit under the base shelf provide easy access to shoes or other bulky items.





Thanks to the lightweight torsion panels that make up the storage tower, it's a one-person job to lift it onto the shelf. Use screws (or drywall anchors) to secure the tower to the wall.

Installing the Organizer

With all the parts of the closet organizer assembled, you're much closer to experiencing less mess and more closet space. But first, there are just a few more steps you have to take care of before installing the organizer.

The first step is to give all the parts a light sanding. After wiping away the sanding dust, you'll want to finish the components before they go in place. (I used a cherry-colored stain and a few coats of varnish to protect the wood.)

At this point, the first part to install is the base shelf. You'll need to create a mounting surface for the shelf, which is accomplished with 2x2 cleats on the closet walls. These cleats just get cut to size to fit the closet. Then you can screw them to the wall studs.

When you're positioning the cleats, make sure they all sit level with one another. Also, position the top of the cleats 14" above the floor to allow clearance for each of the bins that roll underneath the shelf.

With the cleats in place, set the base shelf above them. Then fasten the shelf to the cleats from underneath with long

washer-head screws, as shown in the *Mounting Detail* below.

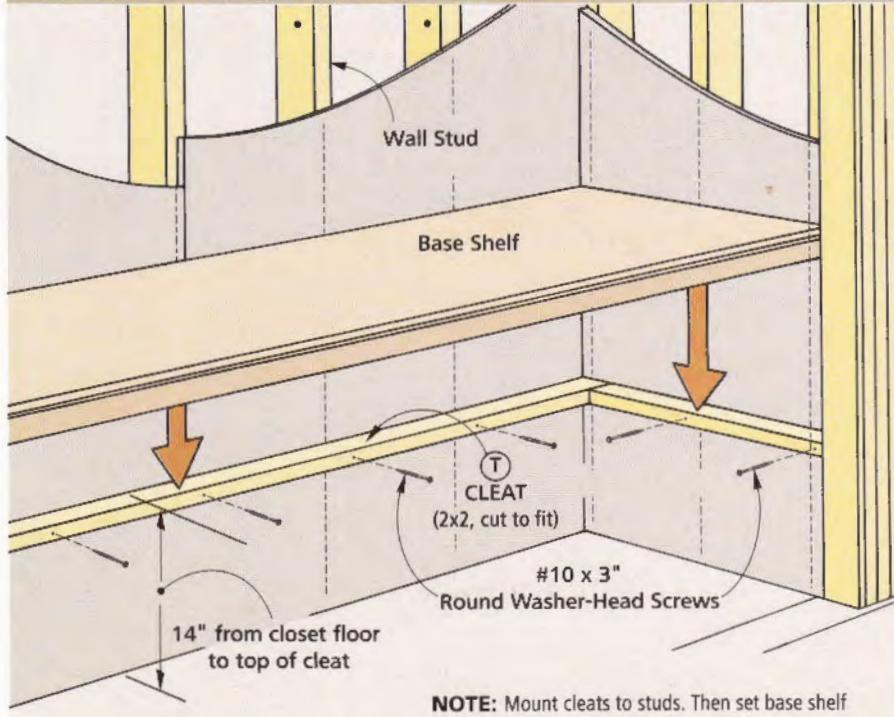
Now go ahead and lift the tower into position, as shown in the *Photo* at left. Adjust its position, so the tower sits square and centered in the closet opening. Then secure the tower in place by driving round washer-head screws into the wall studs behind it, as shown in the *Tower Installation Detail*.

Now that you have the tower installed, you can add the shelf supports, and then slide the adjustable shelves into position. Then add the drawers. The bins simply roll into place below the base shelf.

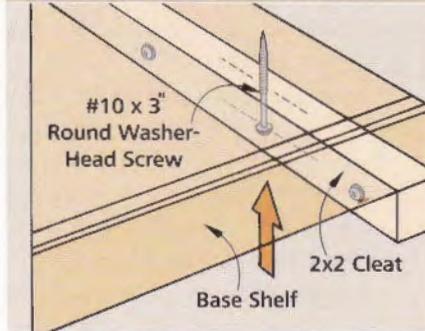
As a final touch, you'll want to install closet rods on either side of the tower. I installed three rods — two on the left side for shorter clothes, and one on the right for longer coats and dresses. These rods are readily available at any home center in assorted lengths and are quite easy to install.

You're now ready to move your clothes back into your closet. And you may need to buy some new ones to fill up all that extra space. ■

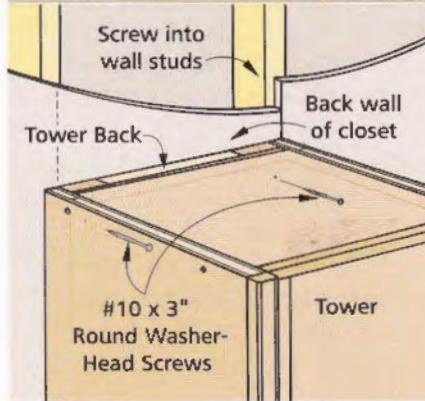
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MOUNTING DETAIL



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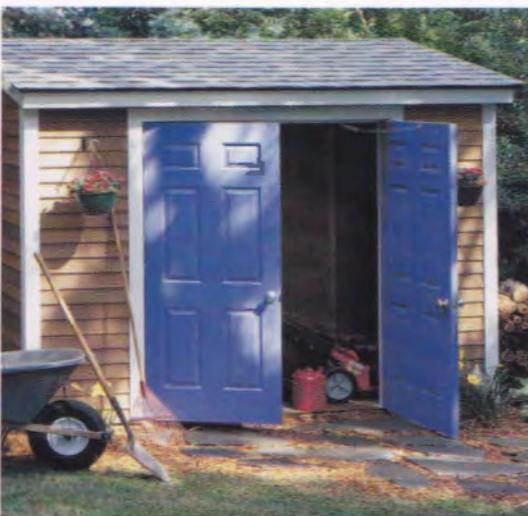
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Create a functional, hardworking shop in just 50 square feet of space. Made from pre-assembled cabinets and other inexpensive materials, it features five workstations, plus storage for supplies.

Cedar Garden Shed

Not too big, not too small, this shed is the perfect-size do-it-yourself project for any homeowner who needs more outdoor storage. And the cedar siding makes it as attractive as it is easy to build.

Countertop Pantry

Every kitchen deserves to have a spacious pantry. Now, every kitchen can with this unique countertop unit. Its three layers of storage provide the space to keep even the busiest kitchen fully stocked.

a look inside ...

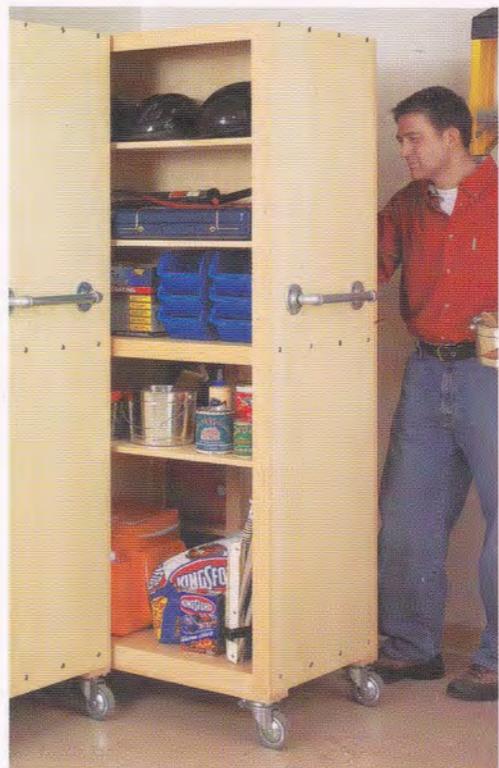


Built-In Book Nook

The elegant display cases get the attention, but look down, and you'll see this bookcase and window seat project also boasts storage drawers and bins along the bottom (flip to page 42).

Drop-Down Storage Trays

Gain more storage in a crowded kitchen by using the space underneath the cabinets to stow spices, knives, or cookbooks (see page 4).



Roll-Out Garage Organizers

You'll be amazed by what plywood, a handful of screws, and some casters can do for your garage storage demands (plans begin on page 68).