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PORTABLE MOXON VISE

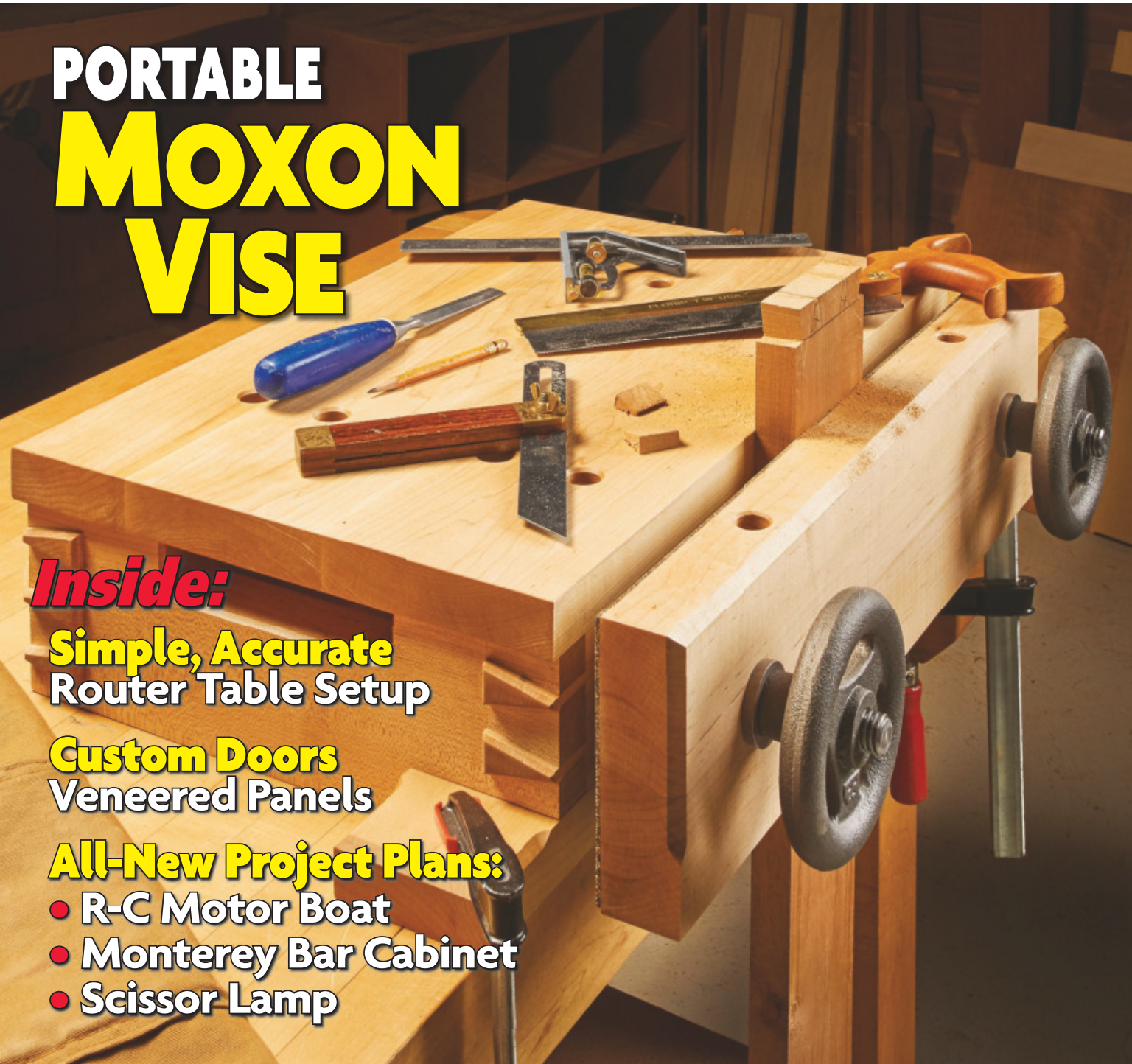
Inside:

**Simple, Accurate
Router Table Setup**

**Custom Doors
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All-New Project Plans:

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- Monterey Bar Cabinet
- Scissor Lamp



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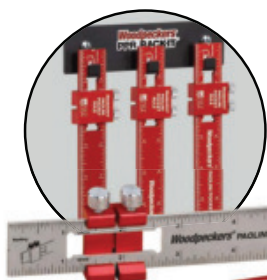
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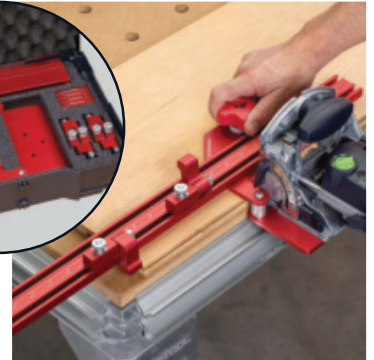
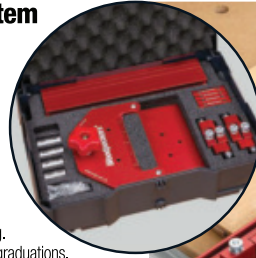
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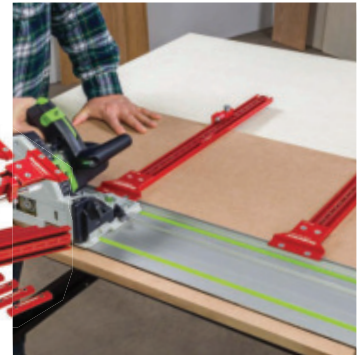
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from the editor Sawdust

What is woodworking? For real, I'd like to know. I've been part of a few discussions recently about whether a given technique or project constitutes legitimate woodworking. For some folk, it centers around furniture projects built with solid wood joinery. For others, it's all about hand tools. I'll submit this issue as a practical example of how I'd answer the question. We have a couple furniture projects (cabinet and coffee table), a model boat, a reading lamp, and a shop-built vise for cutting joints by hand.

In the departments, we have the usual articles on the router and table saw. Erich Lage, who in a past life was a trim carpenter, looks at installing a door. Vic Tesolin shows how to punch up a cabinet door with veneer.

The point is woodworking is a broad craft. And while I don't have the inclination to explore every corner, I do want to showcase and appreciate skill and craft wherever I find it. Let me know what you think: phuber@aimmedia.com



DILLON BAKER, PROJECT DESIGNER

◀ Dillon Baker is a contributing editor for Popular Woodworking and the design editor for Woodsmith magazine. His long-standing appreciation of the duality of art and functionality in furniture design, and his technical expertise in crafting both modern and traditional

pieces, allow him to approach each project with unique perspectives and a high degree of creativity. Dillon holds a BFA in design from Iowa State University, and prior to entering the publication world, ran a design and build studio in downtown Des Moines, Iowa. Dillon both designed and wrote (his first) the Scissor Lamp project on page 32.

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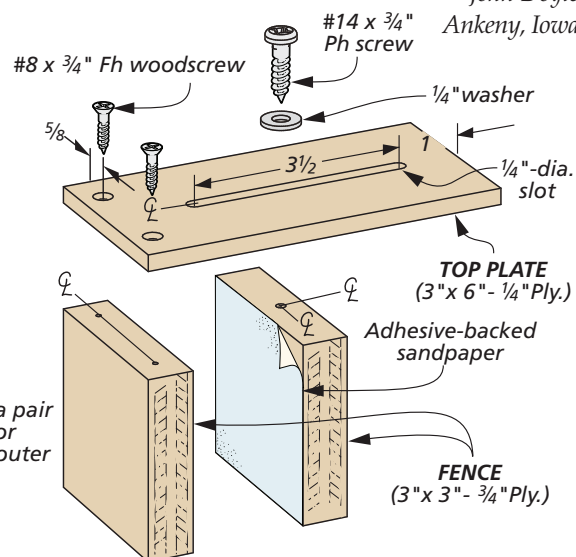
Adjustable Router Stop Block

There are occasions when I need to rout multiple mortises in a large workpiece. A recent project was a bed headboard. Instead of laying out the mortises and trying to eyeball where to stop routing, I decided to make a few stops that I could use with my router. You can see the stops in the photo at left.

SIMPLE, BUT WORKS. The construction of the stop blocks is easy. The stops are an easy build from plywood. A fixed front fence is attached to a top plate. The movable fence is attached to the top plate with a screw through a slot. This way, the stop block works with a wide range of workpiece thicknesses. The inside of the stops are lined with adhesive-backed sandpaper for extra grip.

To use the stops, I position them by aligning my router bit with my mortises. Then, I can use a couple of F-clamps to hold the stops in place.

*John Doyle
Ankeny, Iowa*



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If you have an original shop tip, we would like to hear from you! Jump online and go to:

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You'll be able to tell us all about your tip and upload your photos and drawings. You can also mail your tips to "Woodsmith Tips" at the editorial address shown on page 4. If your tip is selected it will get published right here in the magazine. You'll be entered to win a gift cart to Lee Valley.

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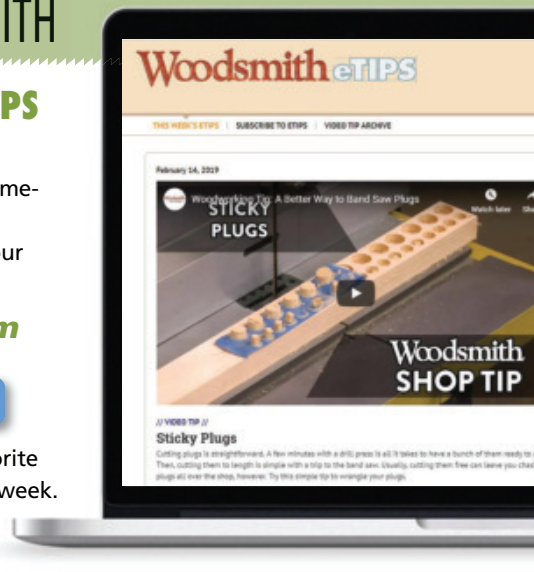
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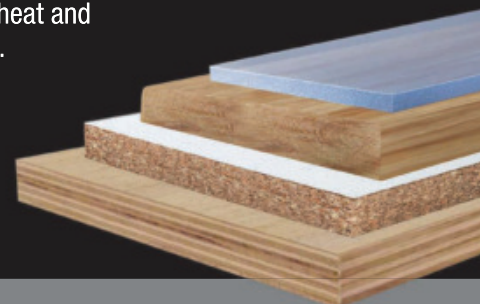
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QUICK TIPS



Sticky Tack Painter Points. Marc Hopkins of Des Moines, IA was looking for a way to hold some small chess pieces in place while flocking the bottom. Sticky tack to the rescue! It not only temporarily secures the pieces, but it's the perfect solution to keep from marring up any of the finish he had already applied.



Even Pressure. Chris Fitch of Winterset, IA has a quick tip to get even pressure when he has a large glueup. By layering a couple of pieces of painter's tape in the center of a board being used as a caul, he is creating a "crown." This allows for the pressure to start in the center of the caul ensuring even pressure when tightening down on your clamps.

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Tighten Loose Miter Bars. Carol Holly of *Grand Rapids, MI* found that some manufactured miter bars had a little play when placed in the slots of her table saw. To fix this problem, Carol uses a strip of aluminum duct tape. The tape can be placed over the bar to take up the slack, but still slides easily and smoothly through the miter slot.



Dust Free Glasses. Jose Corraera of *Austin, TX* was frustrated that his glasses were always dusty when he went to wear them. One day, Jose came up with the idea to house them in a used cleaning wipe can. The can is mounted to the wall with screws and the glasses fit perfectly inside. Now, Jose always has dust-free glasses, and a place to hang his hearing protection.



ENGRAVE | CUT | INLAY

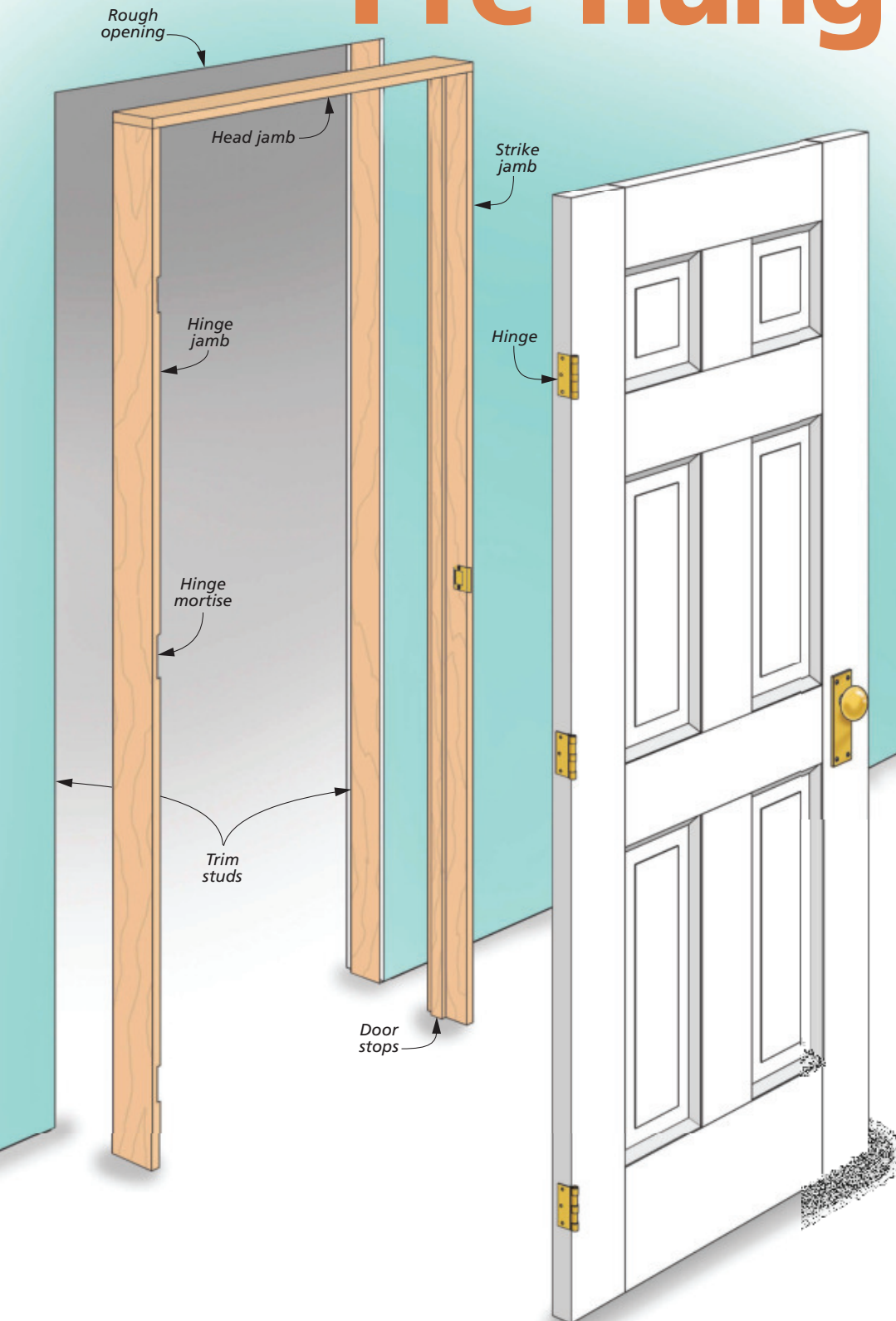
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Installing a Pre-hung door



Trim carpentry is a close cousin of woodworking. Hanging a door is the first in a series of articles exploring this branch of the family tree.

Hanging a door is one of the main tasks of a trim carpenter. Trim carpentry is woodworking on tour. Like a band on the road, working outside the controlled environment of the studio (or your shop) presents new challenges. The main challenge being that trim carpentry is woodworking that's attached to, or integrated with, something larger.

That larger thing in this case is a wall in your house. Trim carpentry is the art and craft of blending rough framing and precise woodworking. It can be a lot of fun when you know

ahead of time the challenges that you'll run into and how to tackle them. Let's take a look at those challenges, starting with the anatomy of a pre-hung door.

A PRE-HUNG DOOR

The main drawing you see on the previous page lays out all the working parts of a pre-hung door. What you have is a wood slab or panel door that's attached to a three-sided wood frame. The three frame parts are the head jamb, hinge jamb, and strike jamb. The door is attached with hinges to the hinge jamb of the frame. The hinges are mortised into the door and frame. The hinges hold the door flush to one side of the jamb frame. I'll call this side the "hinge," or "reveal," side of the door.

On the other side of the pre-hung door are the door stops. (The "stop" side of the door.) The door stops prevent the door from swinging too far into the jamb. The stops also work in tandem with the door knob and strike plate to hold the door closed without any rattling.

For the sake of simplicity, the door we're hanging resides in a standard 2-by-4 wall that is sheathed with $\frac{1}{2}$ " drywall. This means the jamb width is $4\frac{9}{16}$ ". (It's wider than the wall to help the trim casing fit better.)

OTHER DOOR DETAILS. If you're responsible for ordering the door to go into the rough opening, an easy way to figure out the width is to measure the rough opening and subtract 2" from the measurement. Unless you're in a very old house 80" is the standard height of a door.

Also, in this article, I won't go into what's called the "handing" of the door, which is about how the door swings. Just take a picture of the existing door and the room it's in and let the fellows at the order desk of the lumberyard, or home center, help you

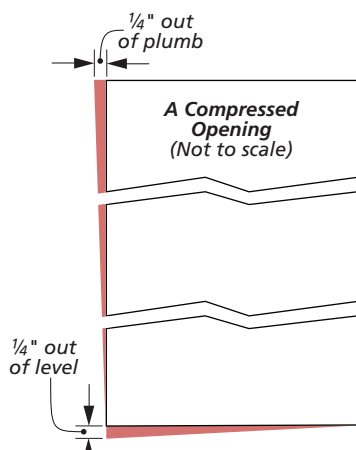


figure that out. When you've got your door on site, it's time to get to work.

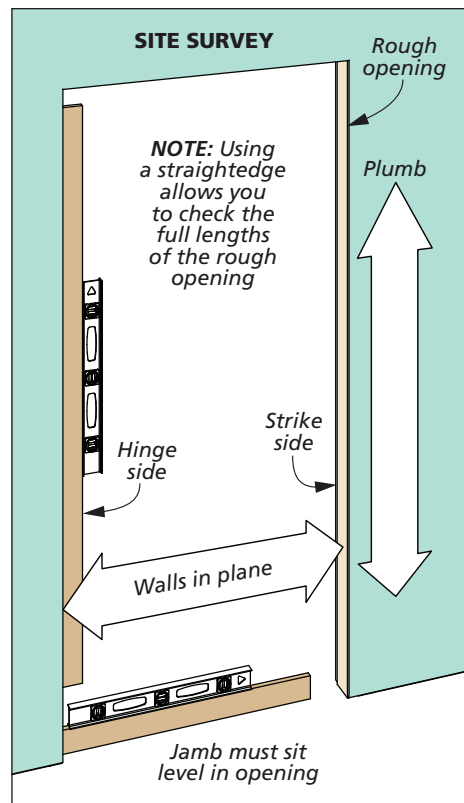
SITE SURVEY

Surveying the site, which in this case is the rough opening, means doing a diagnosis of the area where you're going to hang the door. The drawing to the right shows an example of what I'm talking about. There are two things to focus on in this site survey, the floor, and the side of the rough opening where the hinge jamb attaches. Let's start with the floor.

THE FLOOR. For the pre-hung door to operate properly it has to be level and plumb in the rough opening. So the first thing to check in the rough opening is the level of the floor. For the sake of this demonstration we'll say that the floor is $\frac{1}{4}$ " low on the hinge side of the rough opening as is shown in the detail above.

If you're working on a finished floor, such as a hardwood or tile floor, you'll need to trim the strike jamb $\frac{1}{4}$ ". If the floor is a rough subfloor, you can place a shim under the hinge jamb and remove it later.

Also, be mindful of the flooring treatment that goes on top of a subfloor, you might have to lift the whole pre-hung door off the floor to account for carpet and pad. Or you can trim the bottom of the door later if need be.



THE WALL SURFACE. The wall on both sides of the rough opening must be plumb and in plane to each other. If they're not, the jamb will be twisted in the opening. The results are that the door will stick out of the jamb at the top or bottom. So, this is the time to make sure the wall surface is in plane.

THE HINGE JAMB. Plumbing the trim stud that the hinge jamb attaches to is the most important step in this whole process. To get an exact reading on the stud you need a level long enough to span the hinges on the door. If you don't have such a level, you can extend the reach of your two foot level with a straightedge like you see in the drawing above.

Now as earlier, we'll say the hinge jamb is out of plumb at the top by $\frac{1}{4}$ ". So we need to use shims to bring the framing back to plumb. Turn the page and let's look at shims and other hardware you need to install a pre-hung door successfully.

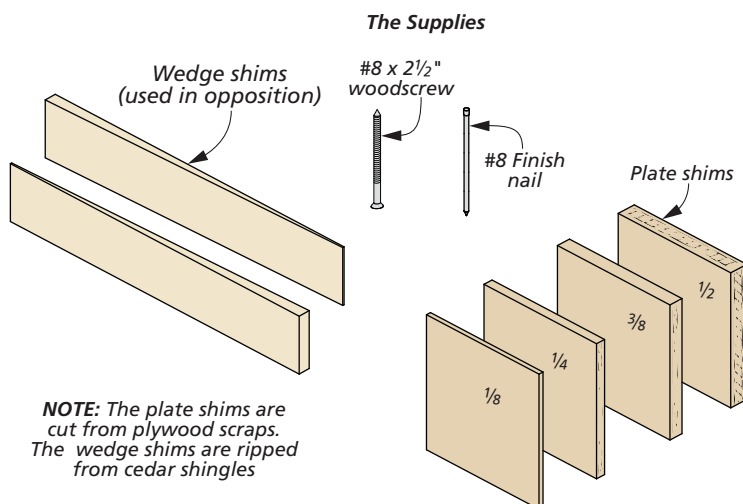
SHIMS & FASTENERS

There are two types of shims that I use in three different ways. Plate shims are just 3" square pieces of scrap plywood in varying thicknesses. A plate shim is used to aid in plumbing the opening, but also they give you the option of sliding the whole door in the rough opening. Technically, you can do this with wedge shims, but you'll use up a lot of them, and they can be a little unwieldy in the process.

Wedge shims are narrow, tapered pieces of wood that I've cut out of long cedar shingles. You can buy pre-cut shims that work fine. These shims, when used in pairs, with the tapers opposing each other, provide you with infinite adjustability.

I use the wedge shim in two ways. First, as anchor shims to lock the hinge jamb in place. And to provide solid support above and below the strike plate on the strike jamb. The second use is as support shims. Once the anchor shims are in place, I fill the gaps around the jamb with these pairs of shims just to stiffen the jamb.

The fasteners used to hold the shims and jamb in place can be traditional finish nails (#8 finish



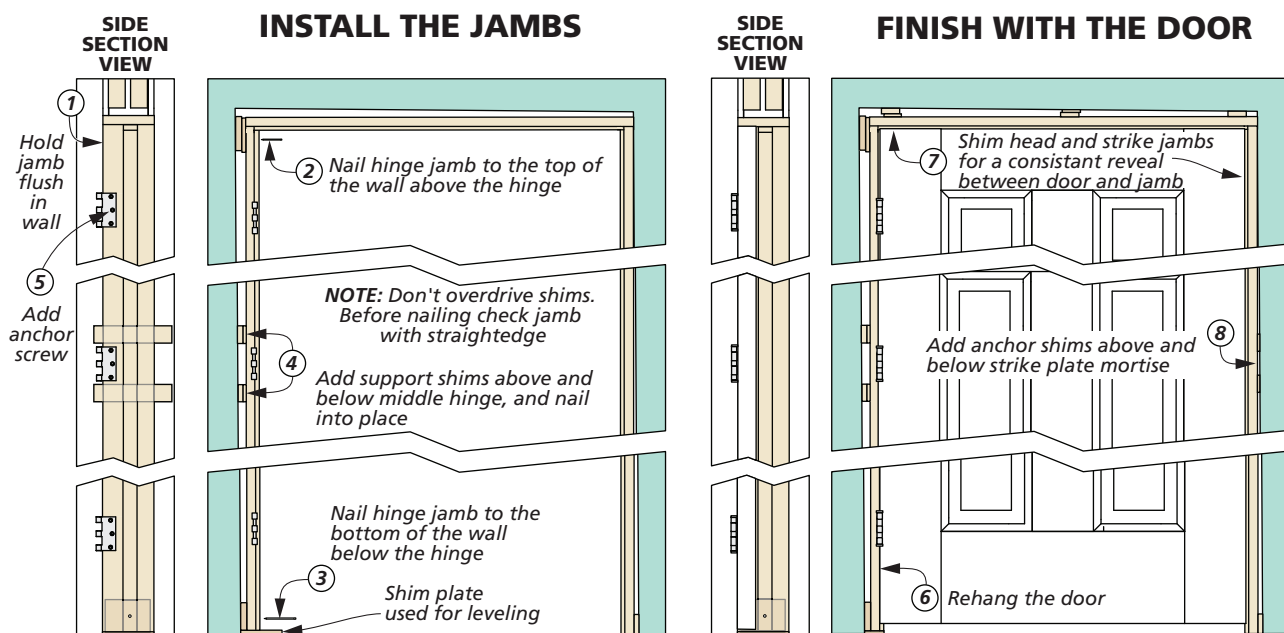
is what I use) or your nail gun with 15 gauge, 2 1/2" nails, and #8 x 2 1/2" flat head woodscrews. So, I've provided you with the basic set up and tools, now it's time to install the door.

JAMB ONLY. You can install a pre-hung door with the door and the jamb together, or, remove the door and install the jamb without the door in the jamb. The latter is the way I always install solid core doors. They're just too heavy to maneuver while you're trying to set the hinge jamb. Here, for the sake of clarity, I've separated the door from the jamb as you see below.

HANG THE DOOR BY THE NUMBERS

The left drawing below shows the initial preparation of the rough opening and the jamb in place. The floor, under the hinge jamb leg, has a narrow 1/4" shim plate to level the door in the opening. This can be removed later, when the door is hung.

The stud behind the hinge jamb has several shim plates attached to it. To center the door in the opening there are two 3/8" shim plates attached at the top and bottom of the stud. Then to plumb the door, add the 1/4" shim plate at the top. Now let's walk through the whole process.



1 — FLUSH FIRST. Start by placing the jamb in the opening, you're going to focus on the hinge jamb side first. Remember, on page 11 we did the site survey and found that both sides of the wall opening are plumb and parallel to each other. So all we have to do here is hold the hinge jamb flush to the wall, confirm it's plumb and nail it in place

2 — FIRST FASTENER. Nail the jamb to the wall above the top hinge. You can use a screw here as well. Drill a pilot and counter-sunk hole first.

3 — SECOND FASTENER. Now move to the bottom of the hinge jamb. Hold the jamb flush to the wall and nail the jamb to the wall. But first, double check the jamb with your level.

4 — SUPPORT SHIMS. Slide a set of support shims above and below the center hinge. Using the long straightedge, make sure the jamb surface is flat, not bowed

or concaved, then nail the center of the hinge jamb to the wall.

5 — SCREWS. Now, back at the top hinge leaf, replace the upper center screw with a long wood-screw. Don't over-tighten the screw. Now that the hinge jamb is securely in place, you can hang the door.

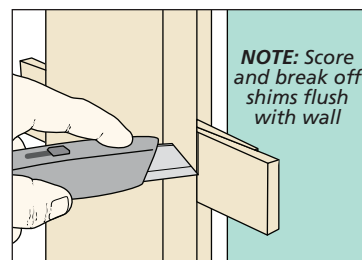
6 — HANG THE DOOR. To make the final adjustments you won't need your level or your straight-edge, you'll use the door to fine-tune the gap between the head and strike jamb, from the reveal side of the door. To re-hang the door, take the hinge pins in hand and drop them through the leaves, starting with the top hinge.

7 — FLUSH FIT. Since you confirmed earlier that the wall is flush, this step should be a breeze. Add shims at the top and bottom of the strike jamb. Adjust them as needed to make the gap (reveal) between the

door and the jamb consistent along the head and down the length of the strike jamb.

8 — MORE ANCHOR SHIMS. Nail a set of shims above and below the strike plate mortise. This is the point of impact on the door, so you want the connection of the jamb to the wall rock-solid here.

9 — MORE SUPPORT SHIMS. All that's left to do is add support shims around the door to stiffen the jamb. After setting the nails it's time to trim the shims flush. As you see below, do this with a utility knife and a hammer. But be careful, hitting the shims can knock the jamb loose. **W**

A woman wearing safety glasses and a mask is using a CNC router to carve a wooden sign. The sign has a pineapple and the text 'Welcome Mom' and 'You'. The Woodcraft logo and tagline are also visible.

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Setting up a Carving Space



The longer I'm around woodworking and woodworkers, the more I realize just how broad this craft is. My projects tend toward furniture and cabinets. But in the last few years, I've dabbled in some carving. It offers a change of pace and a set of new skills to learn — and tools to get.

Along the way, I've discovered that carving has different workshop needs than what I already have set up. The biggest difference is that you don't need much space at all.

While there's a lot of information about setting up furniture making shops, there isn't much on creating a space for a dedicated carver. So my aim is to talk

about the big ideas of a carving shop: workspaces and workholding, lighting, and layout, then we'll get into the tools and gear to get you started.

There are at least two carvers on the staff of *Woodsmith*, Steve Johnson and Chris Fitch. The recommendations you'll see on these pages follow their own experience and advice.

One point of clarification I want to make. Your carving shop will definitely look different than this one — as it should. There are many paths to tread in carving. So your tools, space, setup, and materials will conform to your needs and grow with you. As the saying goes, "We shape our tools, then they shape us."



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▲ While a stout bench is foundational, it may not be the best place for long-term working. For smaller pieces, a riser box made from MDF allows you to stand more upright and maintain fine tool control.



▲ Sharp tools are critical. It pays to keep your sharpening gear out in the open so you can quickly pause from your work to touch up an edge before it gets too dull.



The Space

A carving shop requires very little furniture, so it's possible to set up shop in a corner of the garage without affecting parking. If you stick with hand tools, like Chris and Steve, you could even make your shop in a room of your house. Just be sure to develop the habit of sweeping up to avoid tracking chips around.



▲ Typical overhead lighting (top) washes out detail and flattens textures — hallmarks of carving. Side lighting from lower angles (bottom) sharpens your view.

A WORKBENCH. Both guys agree that one shop essential is a solid workbench. Size really isn't an issue, but stability is. The bench shouldn't wiggle or move around while you work.

The one shown here is less than five feet long. It borrows strength from the wall it's attached to without being massive.

RAISED PLATFORM. A standard workbench height isn't always ideal. For small projects where detail and finesse are important, Steve finds a raised platform is better, as shown in the upper left photo. His is just a four-sided box made from MDF.

The main benefit is that it's a back saver preventing Steve from leaning over for long periods of time. Another nice feature is bringing the workpiece closer to your eyes.

A PLACE TO SIT. Chris finds that a comfortable (but not too comfortable) chair presents another type of "workspace." His carving tends toward folk-style shaping with knives. So being able to sit and use your legs,

arms and torso to brace pieces and steady your hands, is a plus.

LIGHTING. Working with sharp tools implies good lighting to see what you're doing. The two lower left photos show what I'm talking about.

Texture and detail are focal points of carved items. However, overhead lighting makes it tough to see those details.

Instead you want to be able to direct the light from the side with an adjustable lamp. This light highlights surface effects. More importantly, side lighting reveals flaws like tearout and torn grain so you can remove it.

SHARPENING. Another way to stifle tearout is to keep your carving tools at the peak of sharpness. It's too easy to take a few more cuts before stopping to sharpen. That's especially true if you need to set up for a sharpening session.

A better approach is to find a place close at hand to keep your honing gear out and visible. This simple step turns sharpening into an easy routine.



▲ There are several way to secure your workpiece. A carving vise (above), bench hooks (above right), or threaded hold-downs (lower right).

HOLDING YOUR WORK. Unlike furniture, carved projects are rarely straight, flat, and square. So you'll need to get creative on keeping a workpiece steady. Chris uses a raised swivelling vise (above). He also braces pieces against bench hooks.

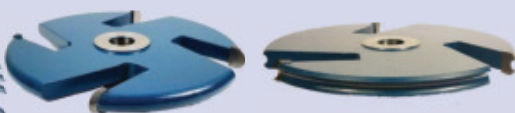
Steve likes to secure pieces to backers with double-sided tape or even screws (left photo on the previous page). Bench dogs, stops, and hold-downs like the ones shown at right that fit into holes in your benchtop are also shop staples.



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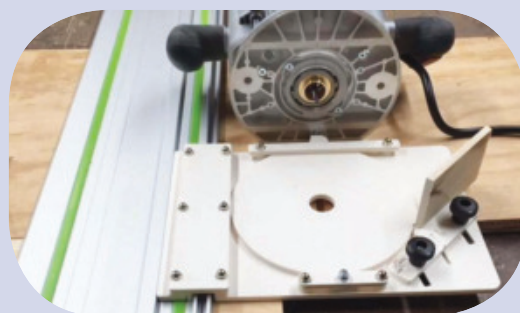
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What can we help you make today?

Having a space for carving doesn't make you a carver any more than standing in a hanger makes you a pilot. The allure of carving is the combination of curves, shapes, textures, and details that you can create. Transferring those ideas from your imagination to a block of wood takes planning, skills, and tools. Let's look at each of these.

PLANNING & PLANS. For furniture projects and case pieces, You can find inspiration and guidance in photos and printed plans. But that's not always the case for carving.

I hadn't really considered this until Steve brought it up in our conversations. In order to fully understand a three-dimensional item, you need a way to see it from all those angles.

MODELS & CASTS. An important part of Steve's shop kit are models of forms and shapes, like the ones you can see in the



▲ Carving can be a (mostly) quiet activity. And the pieces don't take up much space. That means you can turn even a spare room of your house into a space dedicated to pursuing new skills.

photo below. His carving leans towards traditional elements like carved shells and ball and claw feet. So he purchased resin casts of some of these (refer to sources on page 66).

The models allow him to see and feel how the parts of the carving play together. Even if he changes the scale, the model helps understand the proportions and serves as a guide while he works.

MULTIPURPOSE PATTERNS. That's not to say that drawing doesn't play a role in creating carved work. It just takes on a different form. For example, Chris often combines a drawing with a full-size, pattern, as shown in the lower left photo. These patterns are made from hardboard and covered in paper attached with spray adhesive.

Patterns like this serve several purposes. He can draw in details, make notes, and trace the pattern for cutting out. They're small enough to keep as a visual record of projects should he ever want to make another.

ESSENTIAL TOOLS

No discussion of a workshop is complete without mentioning the tools that will be used in the space. What's interesting is that

when I asked Chris and Steve about what they'd recommend as a "starter" set of tools, the conversation quieted down.

That's because specific carving tools depend on the kinds of projects you want to make. One common piece of advice is to avoid buying a big selection of tools right off the bat. Along with that, don't feel that you need to buy new tools. For carving, it's relatively easy to find vintage and secondhand tools for reasonable prices.

FOLK CARVING. The photo on the top of the next page shows the types of tools Chris feels are essential for his mode of work. A drawknife and spokeshave are built for curved surfaces. A small hand plane tackles rough wood removal.

Detail work is the domain of knives and gouges. Chris recommends having a wide gouge, a narrow gouge, and a V-tool. A stout mallet is used to drive the gouges. And finally, a rasp shapes wood when grain direction can lead to tearout.

TRADITIONAL CARVING FORMS. Steve's carving is mostly gouge based. Again specific sizes don't really matter. A steep curve, a flatter curve, and something in the middle. He says to get both



▲ Three-dimensional resin casts and wood patterns are helpful to understand shapes for carving. Flat patterns can hold notes and be filed for later use.



▲ Getting started in carving only requires a few tools. Your kit and specific needs will guide future additions. Instant glue is a must for quick fixes.



wide and narrow versions in the same curvature (sweep).

He likes having two different-sized mallets for heavy and light work. A compass and divider are used to layout work, stepping off even increments as well as curves and arcs. His secret tool is instant glue and accelerator (inset photo). Not only can it be used to secure a workpiece to a backer, but also helps to repair bits of wood that were removed accidentally.

Setting up a carving shop is more of an on ramp than a destination. No workshop is ever really finished. There are always unique styles of work to explore, tools to add, and projects to make. **W**

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Comparing Push Sticks & Push Blocks

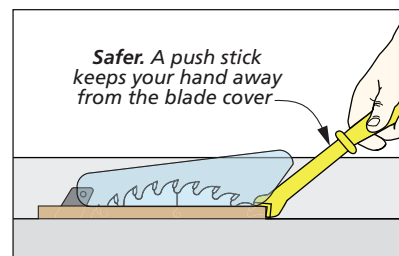


▲ Push sticks (purchased or shop-made) come in two basic flavors: blocks that ride on top of the workpiece (top) or long-handled guides (bottom).

Probably one of the best aspects of a table saw is how many items lay claim to the “top table saw accessory.” The list is extensive.

The choice is heavily influenced by the type of tasks a person is performing at the saw on a given day. So for my contribution to this list, I submit the push stick. It’s essential for maintaining control over a workpiece during ripping while also keeping your hands safely clear of the blade.

The inspiration for this choice comes from a trip through the shop one afternoon at Woodsmith. There are three table saws in the shop: two for general use and



Safer. A push stick keeps your hand away from the blade cover

one set up as a “dado saw”—I know, some are called to suffer. As people moved between the saws, you observe different patterns of work and preferences. On the side table of each saw lie a few push sticks. The ones shown in the photo at left are a few that I gathered.

WHAT PUSH STICKS DO. A push stick isn’t necessary on every rip cut.

But once the space between the blade and rip fence gets uncomfortably narrow, it's time to reach for one.

When you cross that line is subjective. Some people employ a hard dimension (6", for example) that specifies when it's time to reach for a push stick. For others, it depends on the material, thickness, and length of the part.

TWO STYLES. For all the variety, the accessories can be divided into two broad categories. There are "push sticks" that have a mouth-shaped notch on the end of a long handle.

The other style I refer to as a "push block." These have a long sole that rides on the workpiece with a heel at the back. This is the style shown in the main photo on the previous page.

Woodworkers often use one type out of habit. But each style has its strengths. If you haven't made up your mind, here are a few considerations.

PUSH STICKS

You'll often find a push stick riding along in the box with a new table saw. This style is designed to work as a team with other table saw safety gear.

The narrow profile of a push stick allows it to slip past the saw blade and riving knife. The design keeps your hand up high and behind the workpiece to avoid interference with the blade guard.

Using a push stick successfully requires learning how and when to use it during the cut. The box on the bottom of the next page steps through the process.

CONTROL. For those who prefer push sticks, there's more to using one than the mechanics of its use. Creative director Chris Fitch is one of the staff that uses the push stick style. He says this design gives you "an inherent sense of safety with your hand positioned up and behind the workpiece. During use, you



▲ Push blocks have an elongated profile that rests on top of the workpiece rather than behind. These can keep parts from rising up on the blade.

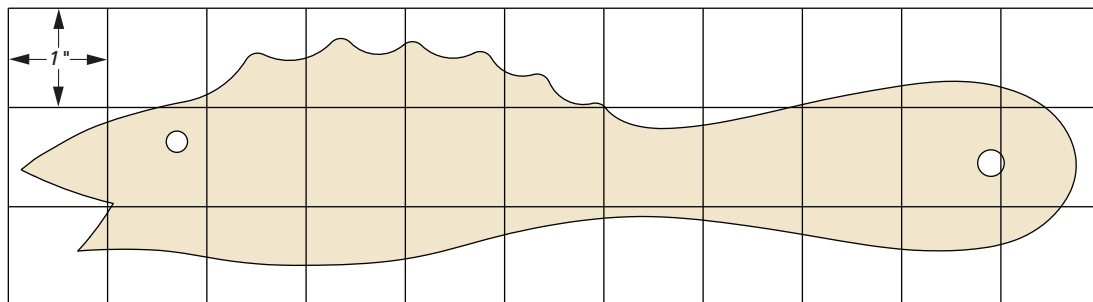
have the sense of driving the workpiece in a straight line past the blade."

As he says, "woodworking is a hobby, so it should be fun." In that vein, he designed a fish-shaped stick, as in the left photo. The mouth catches the back edge of the board. The dorsal fin is scalloped to register your fingers against. To make your own, scale up the pattern below or go to Woodsmith.com/256 for a full-size pattern.

CRITICISM. Not everyone finds this style of push stick effective. Some woodworkers feel that push sticks leave the leading edge of a workpiece vulnerable to chattering or lifting up during a cut. The distance between your hand and the workpiece may also leave you with a reduced sense of feedback from the workpiece.



▲ The mouth-shaped notch at the end of the push stick fits on the end of the workpiece and allows you to drive the piece past the blade. Shop-made push sticks can be easily replaced if they contact the blade.



For plans to make a push stick and push block, go to:
Woodsmith.com/256

PUSH BLOCK

As I mentioned earlier, push blocks have an elongated base that rests on the workpiece. In this setup, the handle position is above the workpiece, but it's still well away from the saw blade.

You'll experience a different sensation when using a push

block compared to a push stick. The feeling is one of pressing down while pushing away.

COMMERCIAL & SHOP-MADE. Commercial versions of this style are usually narrow. This allows you to slide past blade covers for all but the narrowest rip cuts.

Shop-made versions offer a few advantages besides cost (usually free, since they're made from scraps). First of all, they're sacrificial. You can cut into them without damaging the blade, as shown in the left photo.

The push block design I prefer (upper right photo) is made from "two-by" lumber. It's thicker so that when making narrow cuts, both portions of the the workpiece are controlled, improving safety. (The plans for this push block are at Woodsmith.com/256.)

CRITICISM. With your hand over the workpiece, it's harder to use a push block when making narrow rip cuts with a blade guard



▲ This push block features a handle attached to a sacrificial wood body and replaceable heel.

installed. And some people feel uneasy with their hands directly over the blade.

It's important to note that both styles work and both are safe. I recommend that you try each style. In the end, comfort and a your own sense of control and safety will help make the right choice for you. **W**



▲ Shop-made push blocks can pass across a table saw blade safely. This allows you to push both the workpiece and the offcut clear of the blade.

RIPPING ROUTINE

Knowing how and when to use a push stick or push block is just as important as having one. Grabbing the push stick too soon can cause the front the workpiece to lift and chatter. Or shift! If you're too late, the distraction of reaching for the push block can leave your hands close to the blade while your concentration is elsewhere.

Get in the habit of keeping the push device in the same place, every time. Narrow push sticks rest comfortably on top of the rip fence between the fence faces. I like to park a push block against the opposite side of the rip fence. In either case, reach for the push stick or block when your right hand is even with the end of the rip fence.



Beginning. Use your right hand to guide the workpiece into the saw blade. Your left keeps the board against the fence.



Middle. Your left hand keeps the workpiece moving while you reach for a push block (or push stick).



Completion. Follow through the cut with your right hand guiding the workpiece with the push block.

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▲ The finished boat is a wonder to behold. This model pays homage to the line of boats that were popular in the 30s. The fun of building this project is only outdone by the joy of running it through the water.



Remote Control Boat

Yes — you will impress your friends when you emerge from the shop on that sunny Saturday with this boat under your arm. The local pond awaits your wizardry.

Creating a scale model is a magical endeavour. Regardless of whether it's a hot rod, the wolf man, or the boat you see here. That magic sparkles to life when you add a motor into the mix. A motor that's run and guided by a remote control no less.

But, building a boat is a lot like piloting a boat, out on the water there's very little in the way of direction — it's a free-flowing affair that takes a bit of time getting used to. Likewise, there's not a lot of measuring on this project. You're going to exercise some 'fit and feel' skills while making this vessel. Not to worry though, there's a full complement of patterns that get you headed in the right direction if you choose to take on this project. If you're new to boat or model building, you'll get some good exercise here.

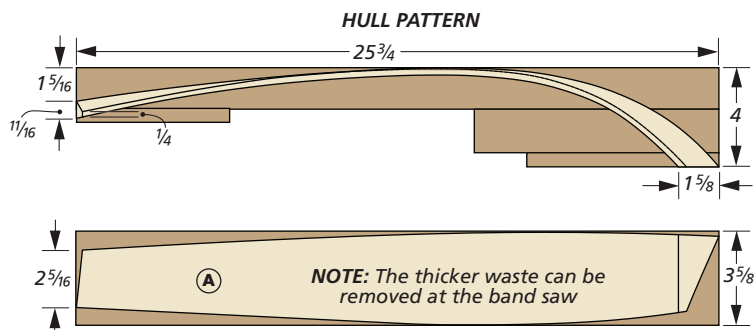
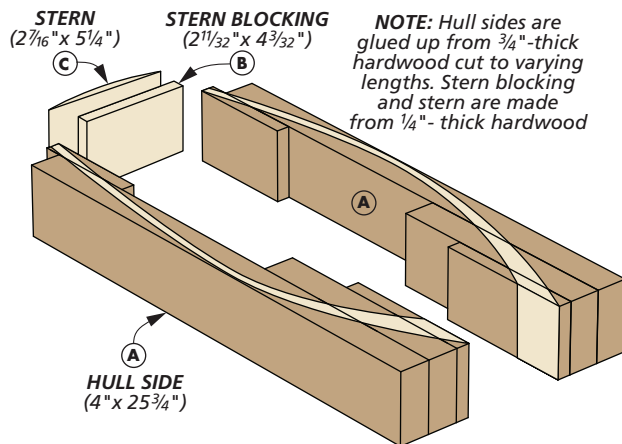
Calling this boat a toy is a bit of an understatement. It pays homage to vintage versions of the *Cris-Craft* style of boats. The model origins and some of the parts are borrowed from a kit that's made by *Dumas Products* (Dumasproducts.com). The kit is the 1938 *Cris-Craft 16' Painted Racer* (#1263).

Our design director Chris Fitch built a simpler boat shell to combine with other parts of the kit. Don't feel like you have to buy the kit though, *Dumas Products* will sell the drive kit (and metal trim kits) from this package upon request. Bon voyage!



▲ The remote control, motor and mounts, battery and battery charger are available from *Dumas Products* (RMPKG-1). They'll also provide the other running hardware you need to get your boat out on the water.





Starting out with the HULL & BOTTOM



For full-size patterns of the boat parts, go to:

Woodsmith.com/256

If you purchased the kit that I mentioned earlier, it's clear that what you see in the drawings above is a streamlined way to create the boat hull. And in the end, it will be every bit as water-worthy as the kit's version.

GLUED-UP BLOCKS. The process starts with $\frac{3}{4}$ " basswood blanks that are cut to size as needed to match the contour of the hull. Titebond 3 is a good glue to use for this phase of the project.

HULL PATTERN. This pattern provides the profile of the inner and outer hull surface. You can glue the pattern to the top of the blanks. Or trace them onto the blanks. Before making the first

cut, hold the halves together, the gap at the back should be the width of the stern blocking.

Figure 1 below shows removing the inner waste of the boat at the band saw. The blade is at 90° for this step and you follow the line closely. Since most of the inside of the boat is out of view, a light sanding is all that's needed. You're close to gluing up the halves. Just two parts to make.

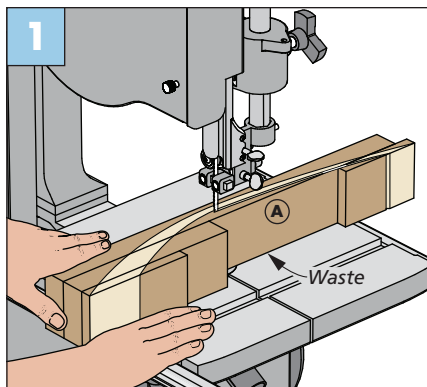
STERN STUFF. Before gluing up the boat you need to make the stern blocking that holds the halves together at the back of the boat. You might as well make the stern at this time. It gets glued on and shaped after the next

step. You can see both of these parts in the drawing above.

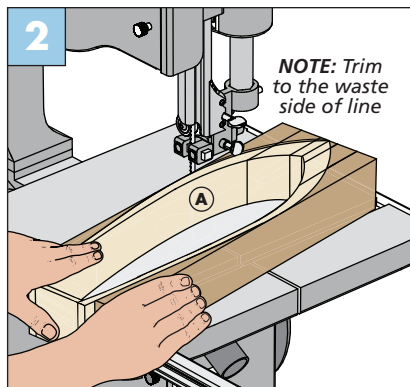
Notice that at the front of the boat the bottom is narrower than the top. As you progress to the back, the profile inverts and the boat is wider at the bottom. So the band saw work (Figure 2) is truly just a roughing-out process. Then take the boat to the bench.

HAND WORK. The use of a round bottom spokeshave to shape the transition of the hull shape from front to back comes in handy here (Figure 3). When you're happy with the results, you can glue on the stern. Then you'll shape like you see at the left side of the main drawing above.

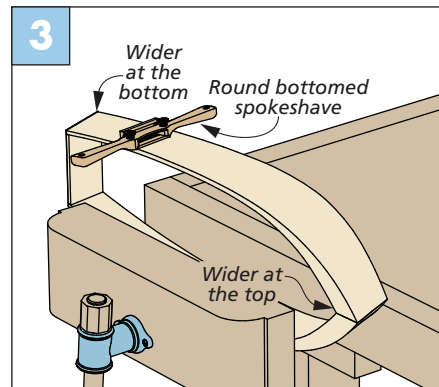
SHAPING THE HULL



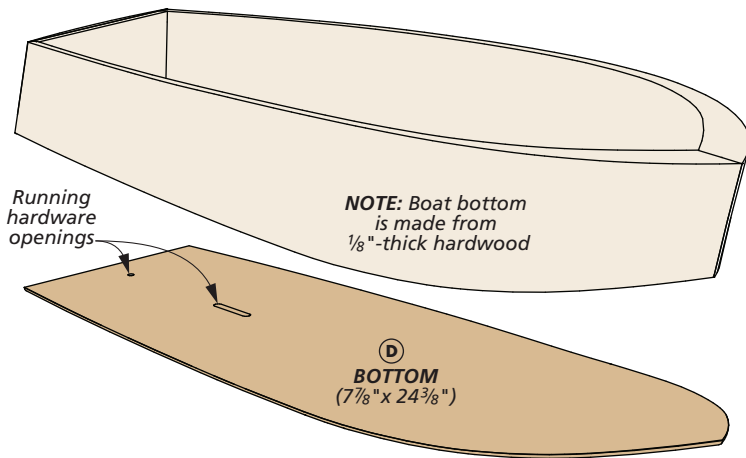
Remove Inner Waste. Your band saw comes in handy for removing the waste on the inside of the boat hull.



Outer Waste Also. The bulk of the waste on the outside of the hull can be removed at the band saw, as well.



Shape the Hull. A round-bottomed spokeshave is the ideal tool to shape the outer hull of the boat.



MORE SHAPING. Take a look at the side of the boat at the top of the previous page. Notice the sweeping profiles of the top and bottom of the boat. After trimming at the band saw, shape the profiles with sandpaper on a flat surface, like your table saw.

THE BOTTOM

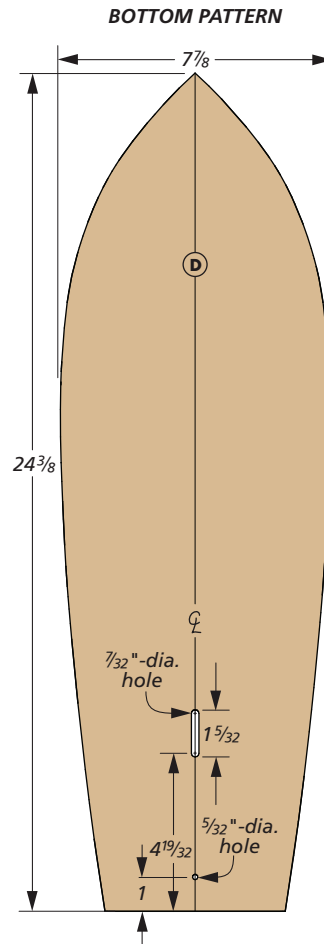
Up next is the bottom made of thin basswood. Plane enough material to thickness for the bottom and the sub deck of the boat. Set aside the sub deck material for now while you focus on the bottom of the boat. It's time for the second pattern.

BOTTOM PATTERN. This pattern shows the slot and hole location

for the running hardware. It also has a centerline to align to the boat. To start, attach the pattern to the bottom blank and cut out the openings for the running hardware you'll install later.

SCRIBE THE CONTOUR. To prepare for scribing the contour, draw a centerline on the inside of the stern blocking. Align the centerline on the pattern to the bow and the centerline on the stern blocking. Now you can scribe the contour of the boat on the bottom (Figure 1, below).

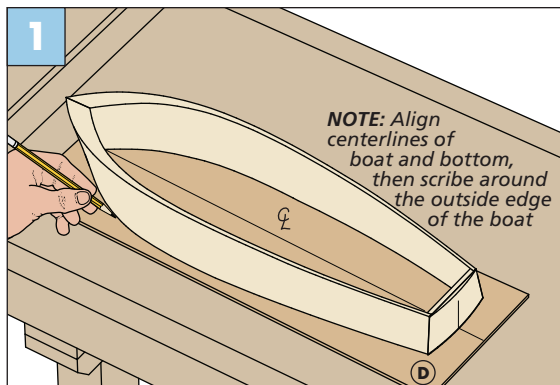
ROUGH CUT & GLUE UP. Cut out the shape of the bottom close to the scribe line. As you clamp up the bottom to the hull (Figure 2) align the centerlines. When



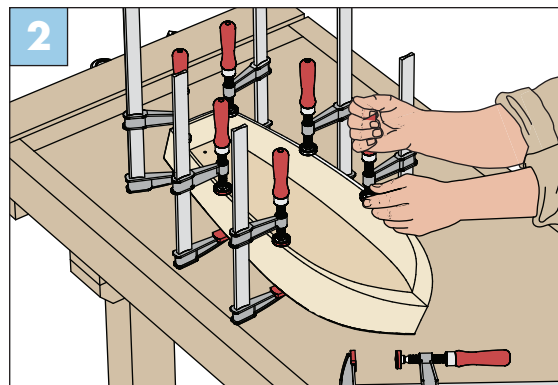
the glue is dry, sand the bottom smooth to the sides.

Next up is making the cabin and the top of the boat. A lot of this will employ the "fit and feel" process I mentioned earlier. Fun.

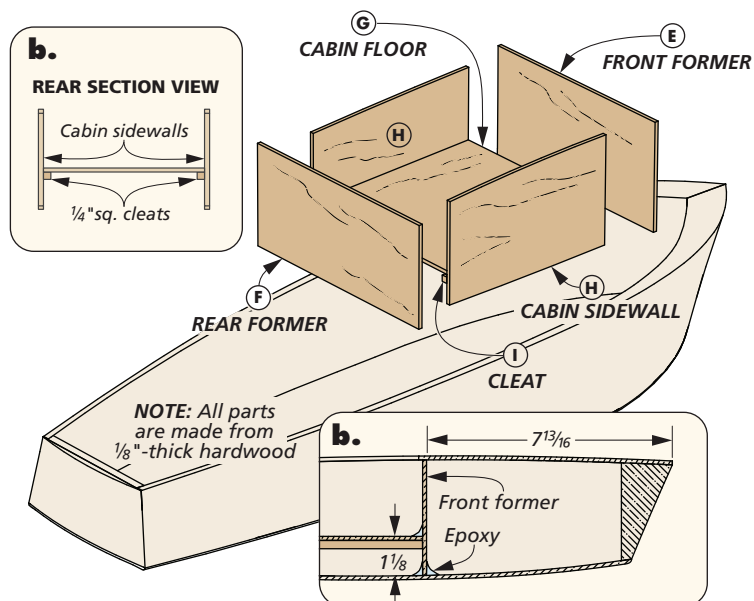
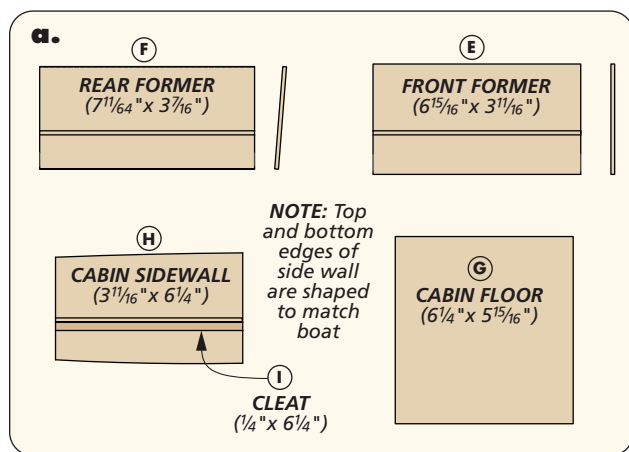
MAKING & ADDING THE BOTTOM



Align the bottom. It's critical to center the bottom blank on the hull of the boat. Scribe and trim the workpiece so it's slightly oversized.



Attach the bottom. You want a water-tight bond between the bottom and the hull. Working from back to front, use plenty of clamps along the sides.



Moving on to the CABIN SHELL & DECKING

The cabin shell is made of two cabin sides, a front, and back former, and a cabin floor. As you see in the drawing above, the floor is supported by cleats. They're held together with a modified epoxy. More on that in a little bit. Let's start by sizing and fitting all the parts first.

THE PARTS. The front, back, and floor are square pieces. The lower edge of the sides are slightly curved to match the contour of the bottom of the boat. The easy way to shape that edge is to start with a workpiece that is longer. Once you've

sanded the bottom edge to fit, you can bring the sides to final length by trimming the other end. It's best to glue the cleats in place before assembly.

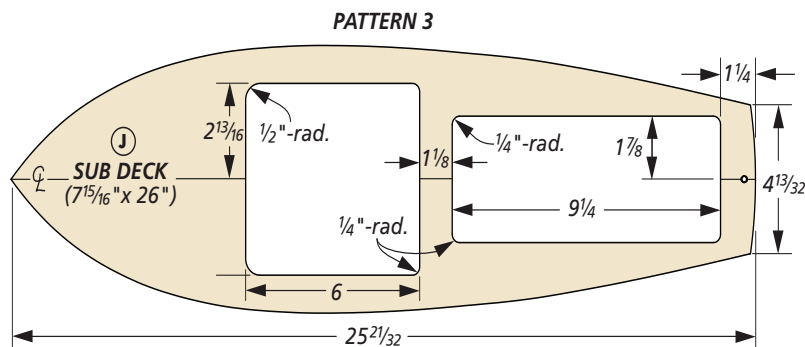
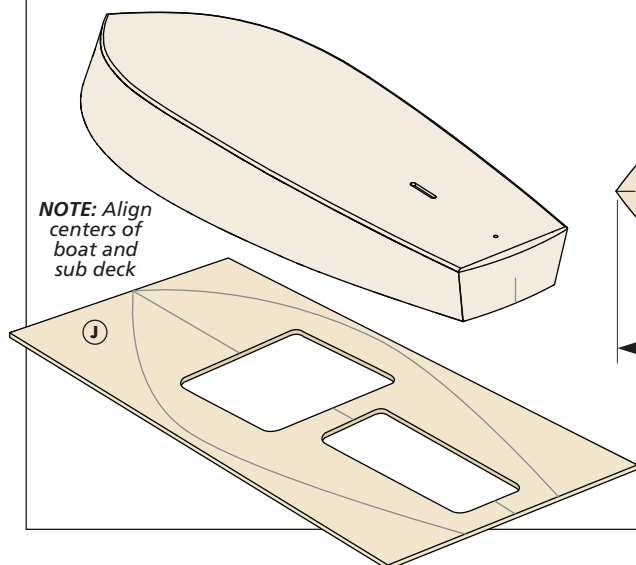
EPOXY TO THE RESCUE. Regular glue won't work here. Epoxy combined with a filler (*colloidal silica*) takes the epoxy to a thickness of peanut butter. The workpieces can be set in a bead of epoxy, then smoothed with a popsicle stick. I put the front in place first, then the sides, and finally, the rear. When the epoxy is set, glue the floor in place on the cleats. The deck is up next.

THE SUB DECK & DECKING

The deck on this project consists of two layers — the sub deck and the decking. It starts out just like the bottom did, an oversized piece of basswood, like you see in the drawing below. You have to make two large openings in this workpiece, one for the cabin, the other for the engine compartment.

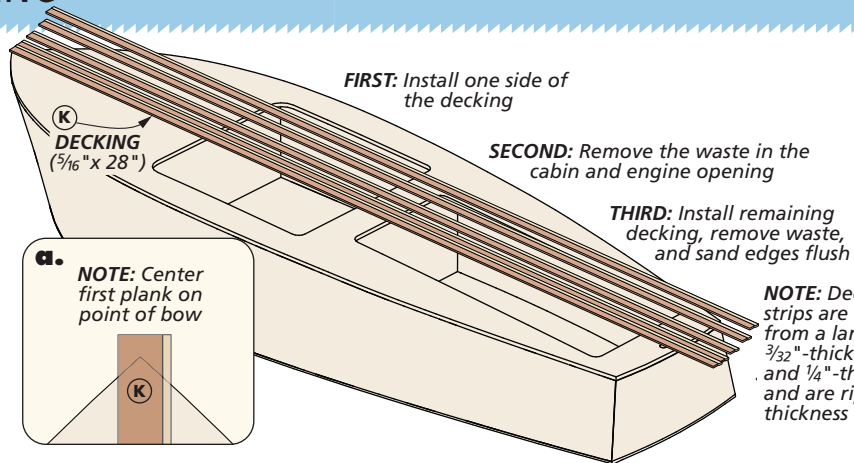
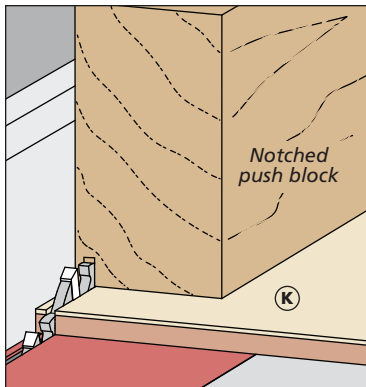
SUB DECK PATTERN. This pattern shows the openings in the sub deck. First, confirm the cabin opening on the pattern with cabin walls you just installed. Then attach the pattern to the

ADDING THE DECK



Two Openings. The sub deck has two openings. The long rectangle at the rear is for the engine compartment. The other opening is for the parts that make up the cabin.

APPLYING THE PLANKING



blank and cut out the two openings before fitting it to the hull.

SCRIBING THE SUB DECK. Finding the outer shape of the sub deck is a repeat of the process you performed on the bottom. Line up the centerlines and scribe the edge of the blank. Then after cutting the shape to the outside of the scribe line, glue the sub top to the top of the boat. While that dries, you can make the decking that goes on top.

DECKING. The decking starts out as a thin blank of basswood that's laminated to a thicker piece of mahogany. The pieces are planed to thickness before they are glued up. The push block you see in the drawing above was used to rip the strips.

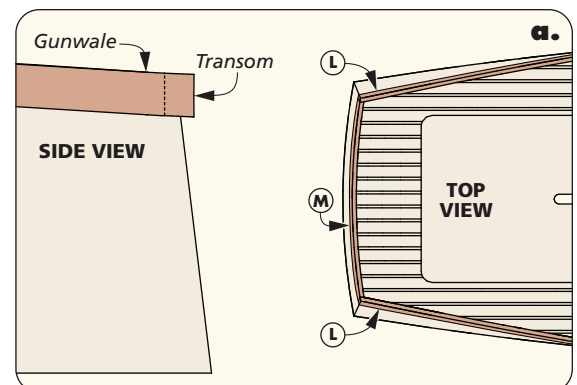
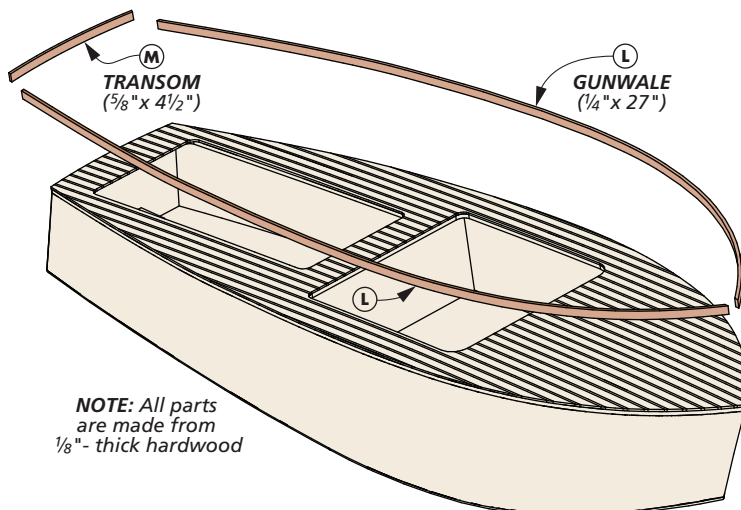
INSTALLING THE DECKING. As you see in the drawing above right, the long strips of the decking are used to span the two openings in the deck. You want to center the mahogany portion of the strip on the point of the bow (detail 'a'), then work your way out from there. After the glue sets (use *Titebond 3* here), trim the openings and sand the edges smooth.

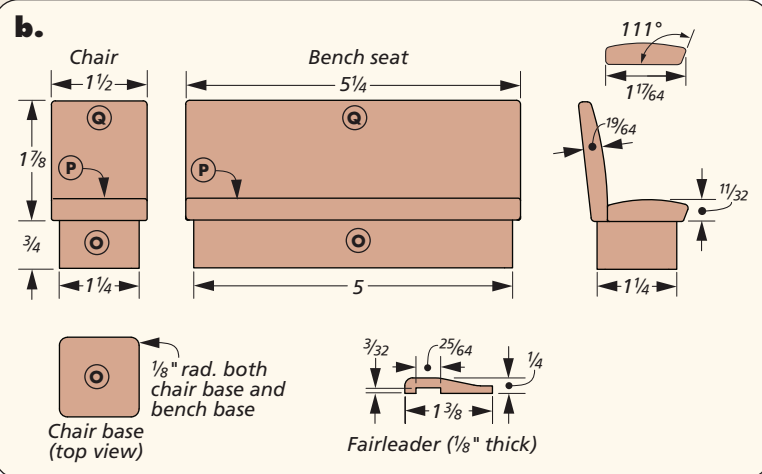
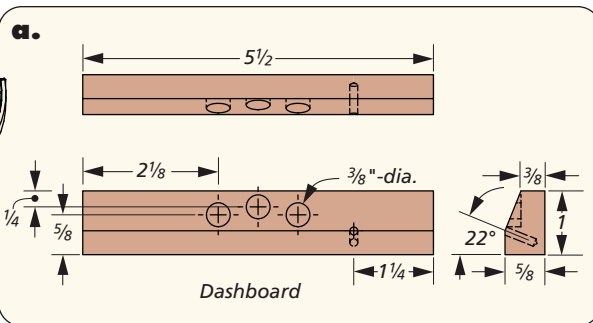
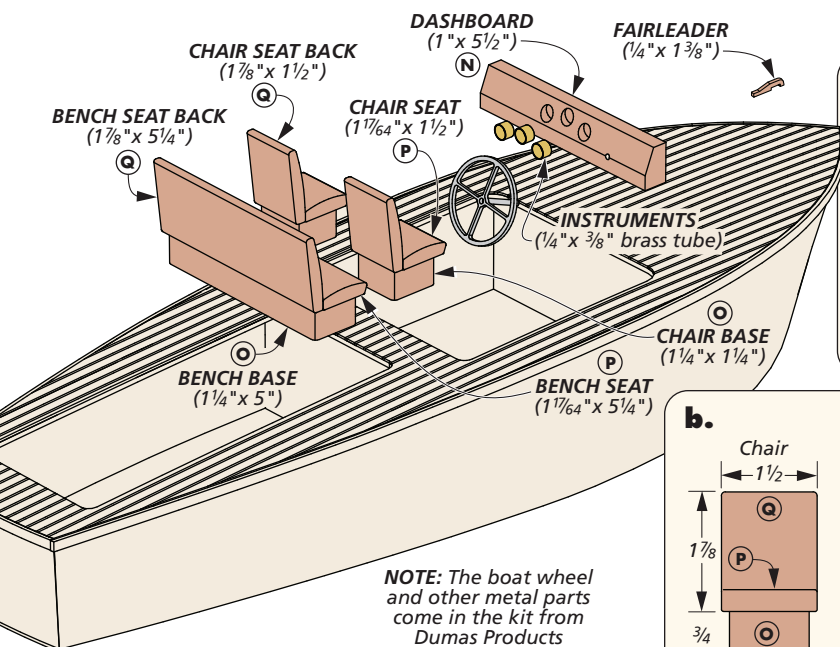
GUNWALE. The gunwale is a piece of trim that wraps around the top edge of the hull and hides the edges of the decking. Since the curve at the front of the boat is so tight, it's best to make a couple of clamping blocks to hold the gunwale in place while it dries. For a pattern, you can

use the outer waste pieces that were left over from cutting out the hull back at the beginning of this project. Glue on one side of the gunwale at a time and trim the points of the bow to fit as you go. Leave the parts long at the stern for the moment.

TRANSOM. The deck is trimmed at the stern with a piece of hardwood that's called a transom (detail below). Its curve matches the curve of the boat stern.

Take an over-wide piece and scribe it to the contour of the edge of the deck. Once you've cut that shape, scribe the angled ends where the workpiece meets the gunwales. The final width of the piece is $\frac{1}{4}$ ". This line is referenced from the back edge of the workpiece. After gluing it in place, trim the gunwales and sand the ends smooth. Now it's time to flesh out the cabin.





Finishing touches for the BOAT & MOTOR

Outfitting the cockpit is a nice diversion from the somewhat tedious work of installing the deck and its trim. A dashboard, two seats and a bench are the parts you'll be making — all of them out of mahogany.

DASHBOARD. As you see in the details above, the dash starts

out as a rectangle that has three holes drilled in it for short brass tubes that mimic instrument gauges. There's a small hole for the shaft of the boat wheel (steering wheel) that's drilled at a slight angle.

After I drilled all the holes, I took the workpiece to the bench and made the slant of the dashboard with my block plane. To complete the look, cut and epoxy in place the brass tubes. Glue the boat wheel in place as well.

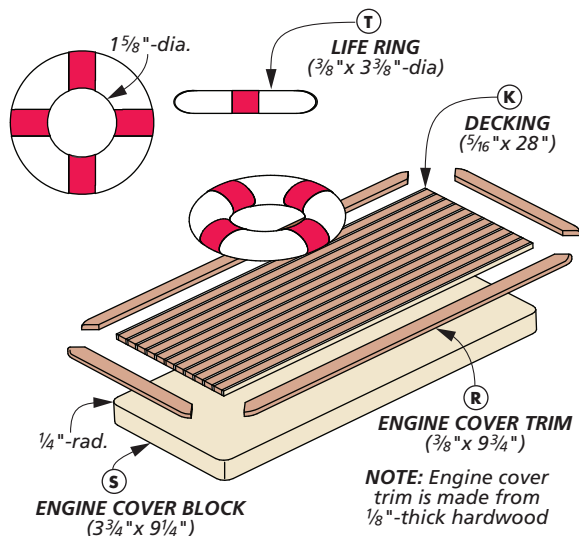
SEATING ARRANGEMENTS. The chairs and bench are next. The bases, seats, and backs start out as long blanks. As the details above show, the profiles of the seat and back are identical for the chairs and the bench. The bases are short blocks with rounded edges. Glue the seat to the base, then, when dry, glue the back to the seat and the base. Now you can glue the parts into the cockpit. The dashboard goes in first. Then the bench at the back, followed by the seats.

One small part to make is the fairleader (details above). The fairleader is glued to the decking at the front of the bow. With that done, you can move on to making the engine cover.

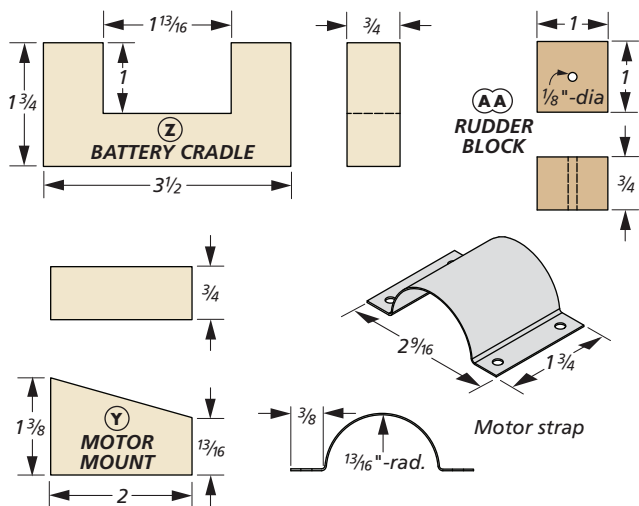
ENGINE COVER

The top of the engine cover (drawing to the left) is made of the same material as the decking. The decking for the cover is rimmed by a mahogany frame that's mitered at the corners. The layout of decking is aligned to the decking on the boat. Start by edge gluing together more pieces than are required to cover the engine opening. Then trim the workpiece to its final length. To establish the width of the cover, set it on the decking over the engine opening, align the decking, then mark the width. After trimming the cover to width, make the mitered frame pieces and glue them in place.

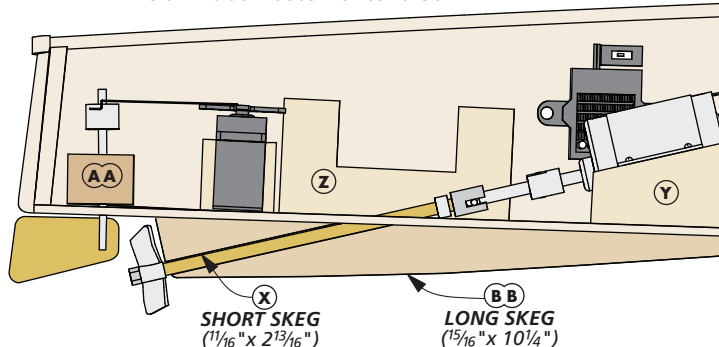
To hold the cover in place, make the block you see in the



MAKING IT GOOOOO!



NOTE: The sequence for installing the motor and running hardware is online at Woodsmith.com/256



drawing along with the cover. Round the corners of the block before gluing it to the cover. Finish off the cover by rounding the corners of the rim pieces.

LIFE RING. The life ring is glued to the engine cover. Start with a square piece of basswood that's planed to thickness but oversized in width and length. Drill the hole for the center of the ring, then trim the piece to final size. As a fun little skill-builder, I chose to shape the preserver with chisels and sandpaper.

FINAL DETAILS

Before adding the delicate trim to the deck of the boat, it's best to install the running hardware.

The details above show you the parts needed. The motor and drive train assembly sequence can be found online at Woodsmith.com/256.

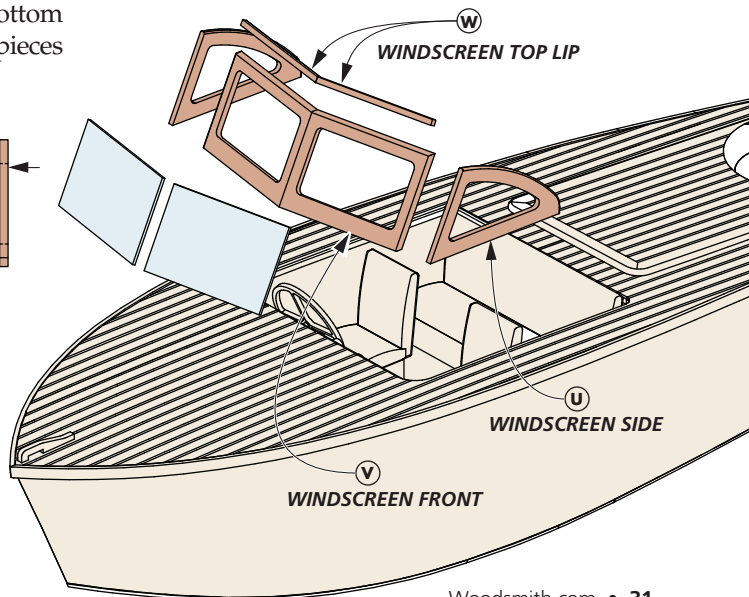
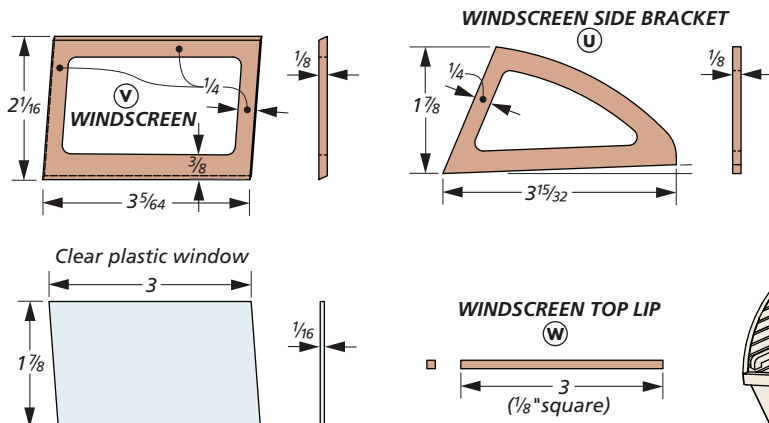
WINDSCREENS & TRIM DETAILS

The windscreens, sides, and fronts, are crafted from thin, solid mahogany pieces. I made all these parts at the scroll saw.

Along with all the other patterns that are online, you'll find one that's the footprint of the screen assembly. After taping the pattern to a flat surface, I sprayed it with a low-tack adhesive. Starting with the side brackets, I sanded the angles on the bottom and front edge of the workpieces

and set them in place on pattern. Now you'll need to sand the edges of the main windscreens to fit the footprint, side brackets, and each other. After the windscreen parts have been finished, glue the plastic windows and their trim in place.

PAINT & FINISH. The hull of the boat is painted with exterior latex paint. The wood parts get a coat of tung oil first, then two coats of lacquer. Then install the windscreen and metal trim parts. As you set the boat on its maiden voyage, remember to hum the theme song to "Gilligan's Island" for good luck. [W](http://Woodsmith.com/256)



HEIRLOOM

Project



When the wings are closed and the lid is dropped, the cabinet takes on the innocent look of a fine piece of furniture for storage.

Monterey Cabinet



Regardless of what you thought about Prohibition, this succulent-looking hideaway for your favorite hard or soft drinks is a fun build.

In the heyday of southern California's Monterey furniture craze, *Mason Manufacturing* was one of the biggest players on the scene. During Prohibition, discrete bars for the home were one of the more popular items that came out of their furniture shops. And the bar you see here was one of the most prized pieces in that collection.

This fold-out, tile topped design is tricked out with all the appropriate accents needed for a well-stocked bar. You'll make most all the parts needed. From the decorative accents on the bottom of the legs up to the wings that fold out, there's lots to do woodworking-wise on this cabinet. Also you'll get to hone your metalworking skills by making backing plates for the pulls, metal corners, the bottle holders for the wings, some stops, and a lid stay.

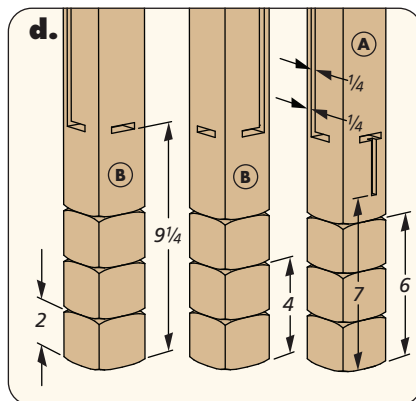
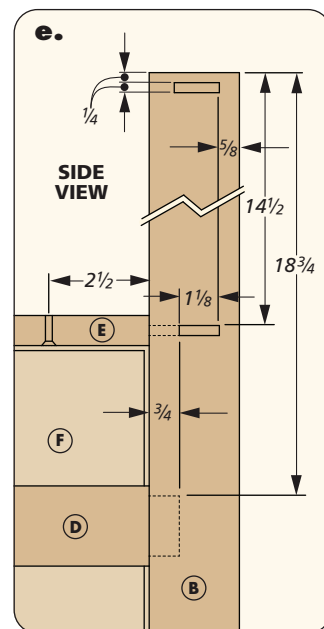
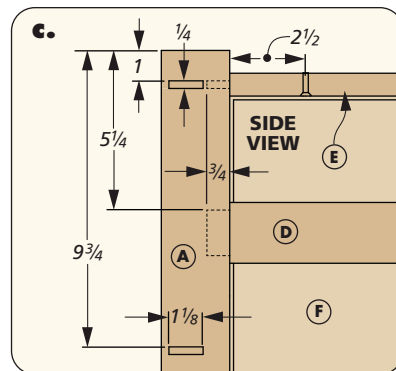
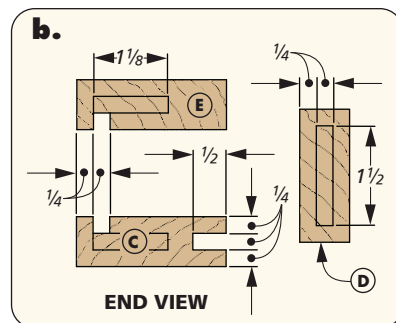
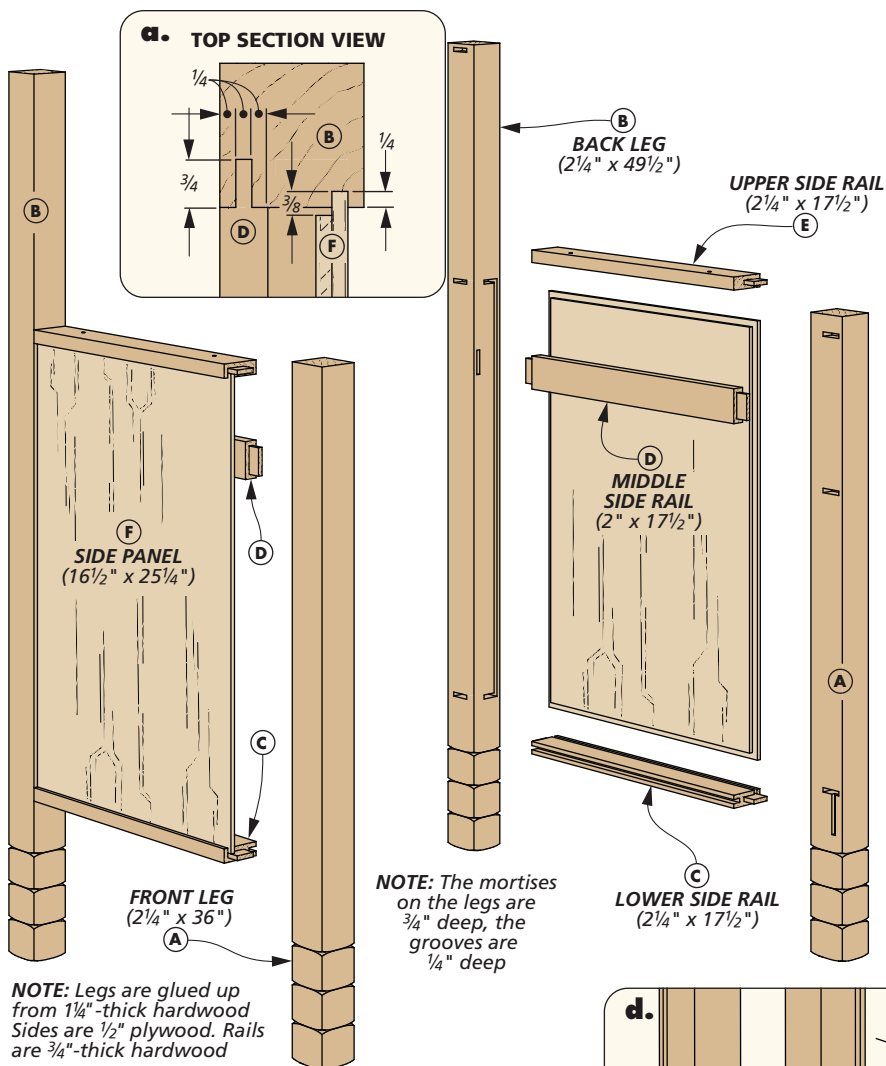
Alder was the wood of choice for this project, it's the well-behaved cousin of birch. And that red finish — yum. It takes several layers to complete, but worth the effort. So set down that drink and head to the shop — well, tomorrow morning anyway.



▲ The inlaid tile top adds beauty and style to the working surface of the cabinet. The art tiles that are framed by standard white tiles protects the cabinet from errant spills and splashes.



▲ The shop-made lid stay holds the lid up and out of the way while you dazzle your friends with your mixology mastery. The cordial rack allows you to keep your favorite glasses close at hand.



First, build the **SIDES**

As with many case projects, it all starts with the legs. The legs are a combination of the foundation and the cornerstone of furniture pieces like the cabinet.

If you take a gander at the details above you'll notice that all the mortises and grooves in the legs qualify them as foundational to the project. Also, the decorative detail at the base of the legs gives a nod to the look of a cornerstone. Let's start by gluing up the legs.

GLUE UP FIRST. Finding alder that's thick enough for the legs was going to be a task, so I glued up the legs from 6/4 boards and planed them to thickness. To save time, I made the front legs

long enough to harvest the wing posts that you'll need later on. (Note, that the combined length of the front leg and wing post makes the blank longer than the back leg.) Once the legs are trimmed to length, there's that decorative detail to tend to.

CORNERSTONE. The bottom of the legs have a segmented pattern cut into them. It's a classic Monterey furniture touch. You're going to make the cuts in the

corners of the legs with a jig at the router table and a point cutting radius bit, Figure 1 on the next page shows this in action.

To join the cuts in the corners, I gathered up the legs, and a back saw, and moved over to the workbench. With a sharp pencil and my combination square I drew a line to join the bottom of the V's. Then it's just a matter of making a shallow cut with the backsaw between the corners.



For full-size leg patterns patterns, go to:

Woodsmith.com/256

You can clamp a board to the leg to guide the saw if it's more comfortable for you.

MORTISES & GROOVES. It's a good idea to lay out all of the locations of the mortises and grooves on the legs to keep things in order. The short mortises were made at the drill press (Figure 2). The grooves, long and short, are

done at the router table like you see in Figure 3 below.

RAILS. The rails hold the side panels in place and bring the legs together. Making the tenons on the rails is covered in Figure 4 at the bottom of the page. Figure 5 shows how to make the necessary grooves for the plywood sides and bottom.

Speaking of plywood, notice in the main drawing on the previous page the rabbet along the outer edge fits in the grooves.

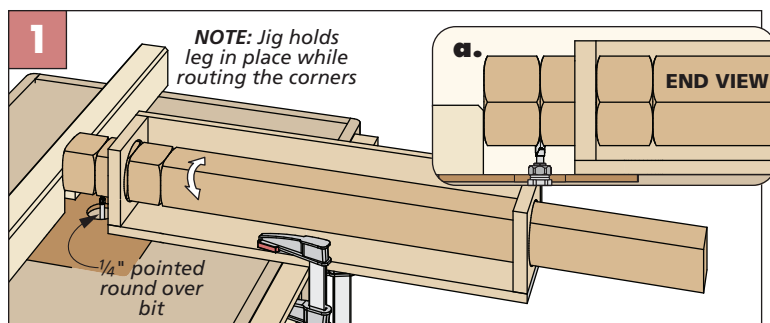
GLUE UP AGAIN. Once you've tidied up from the machining steps, you can haul out the clamps. Remember to check for square and clean up any squeeze-out. Next, more rails.



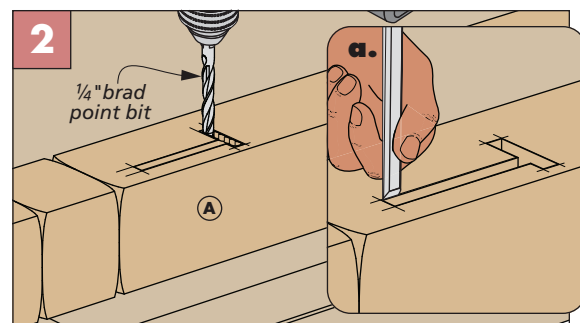
For plans to make the leg jig, go to:

Woodsmith.com/256

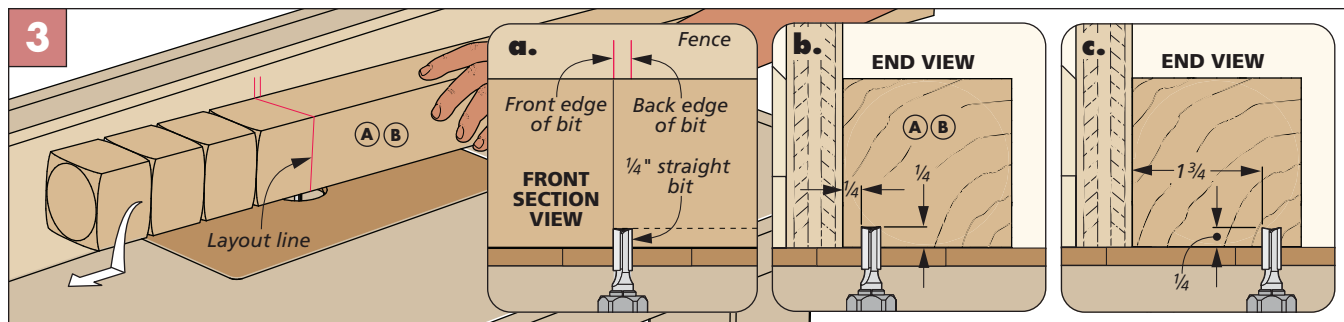
PLENTY OF LEG WORK



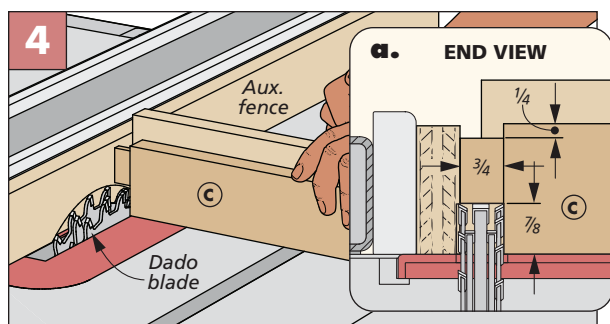
Leg Decoration. The jig lifts the leg off the router table and allows you to rotate it. The router bit scores the corners of the legs. To make the next corner cut, move the fence and repeat the process.



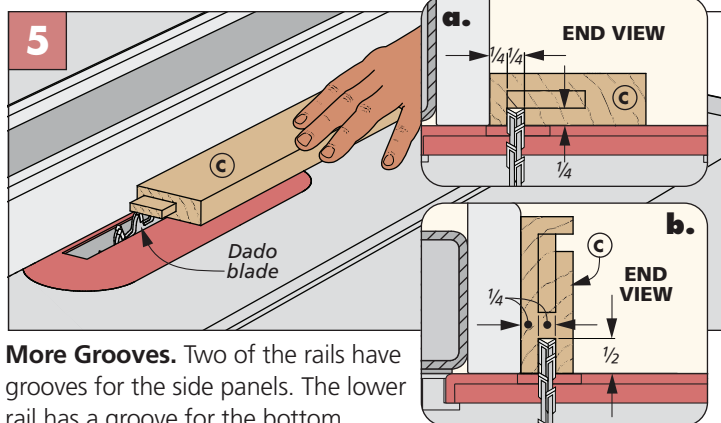
Mortises Next. Some time spent at the drill press drilling the holes for the mortises. Then you can square the corners with a sharp chisel.



Long Grooves. There are long, stopped grooves in the legs for the side panels. First, mark the start and stop positions on the legs. Then, mark the location of the front and back of the router bit on the fence (detail 'a').



Making Tenons. Your table saw, and a dado set that's buried in an auxiliary fence, is the setup you need to make the tenons on the ends of all the rails.



More Grooves. Two of the rails have grooves for the side panels. The lower rail has a groove for the bottom.

The parts that **BRING THE CASE TOGETHER**

The pieces needed to join the two sides of the bar are shown in the drawing and details below. Some stretchers with grooves, some without, they all have tenons.

Between the front and back stretchers we've added two boards to provide rigidity to the tile surface above. Also, there are a couple of decorative corbels thrown in for looks. We'll get to those in a little bit. Let's start with the rails and stretchers.

STRETCHERS. To get the ball rolling, cut to size all the parts we've looked at. Making the tenons is standard fare at the table saw. All you need to know

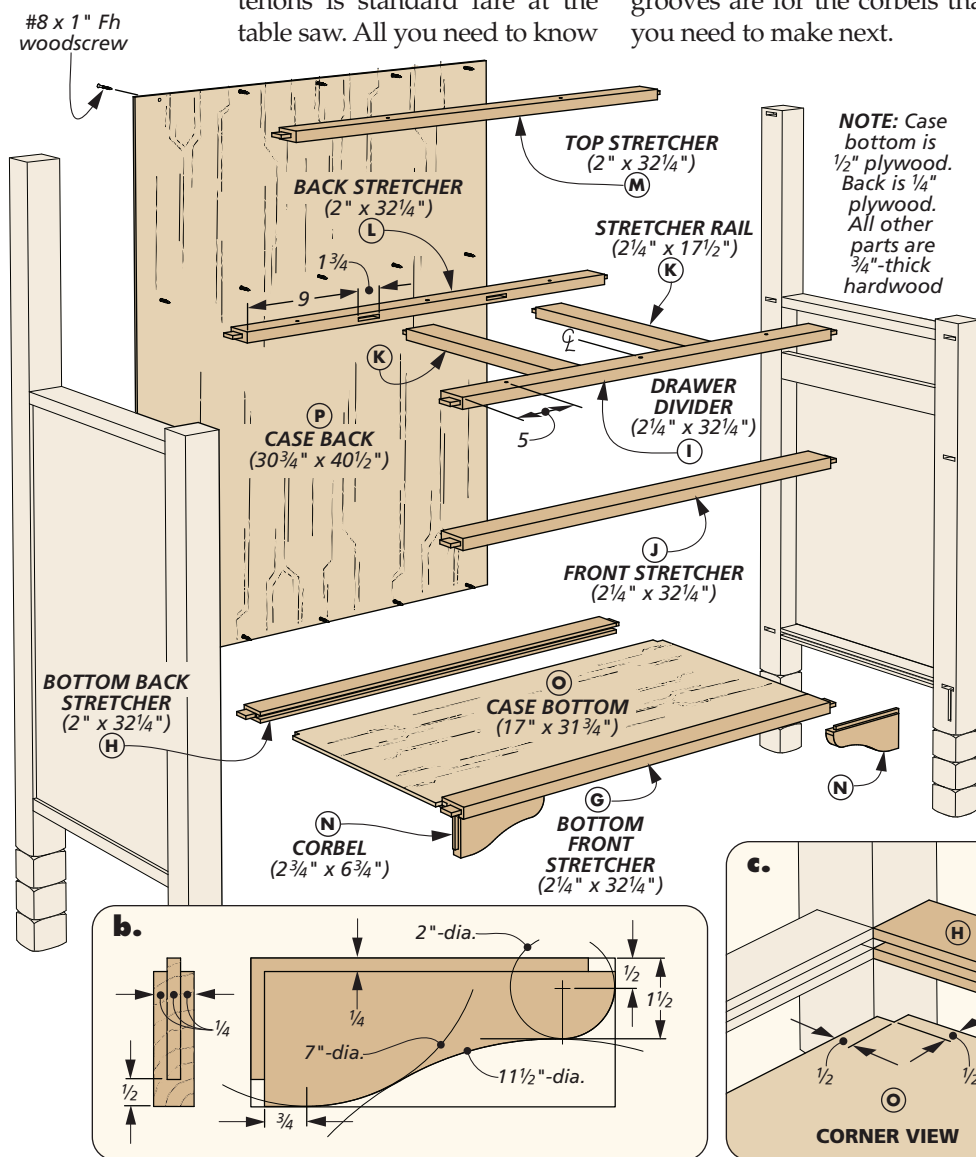
about the tenons you're making here is shown in detail 'a' below. As you see in the main drawing, you need to make two mortises in the front and back rail to receive the stretcher rails. A Forstner bit in my drill press is my go-to method for making these mortises.

STOPPED GROOVES. Now you can take the handful of workpieces that need grooves in them over to the router table. The only grooves that are stopped are the ones in the underside of the bottom front stretcher. Those grooves are for the corbels that you need to make next.

CORBELS. The corbels are a decorative touch to the bottom of the bar. The pattern you see at the bottom of the page can be scaled and used as a template.

The tongues on the top and outside edge join with the legs and bottom front stretcher. Shaping the curved edge won't take but a moment over at the band saw. Then after sanding the pieces, turn your attention to the plywood bottom.

Notice the notches in the corner, those are needed to provide clearance around the legs (detail 'c'). The bottom, like the sides, is made from 1/2" plywood. The bottom needs a rabbet to fit in its adjoining parts. The plywood back is only 1/4" thick and is screwed to the stretchers once the case is assembled (detail 'd').



ASSEMBLY. Now you're ready to bring the sides together, and in the spirit of managing a multi-piece glue up, I did a couple things ahead of the final scene. First, I glued the corbels to the underside of the bottom stretcher (with band clamps). This might seem like a little thing, but having the corbels in place will help square the case.

The other task is the standard procedure of the dry-fit test run. I have let my guard down in the past about this step — and regretted the decision. When the assembly of the case is complete, you can focus on the tile frame.

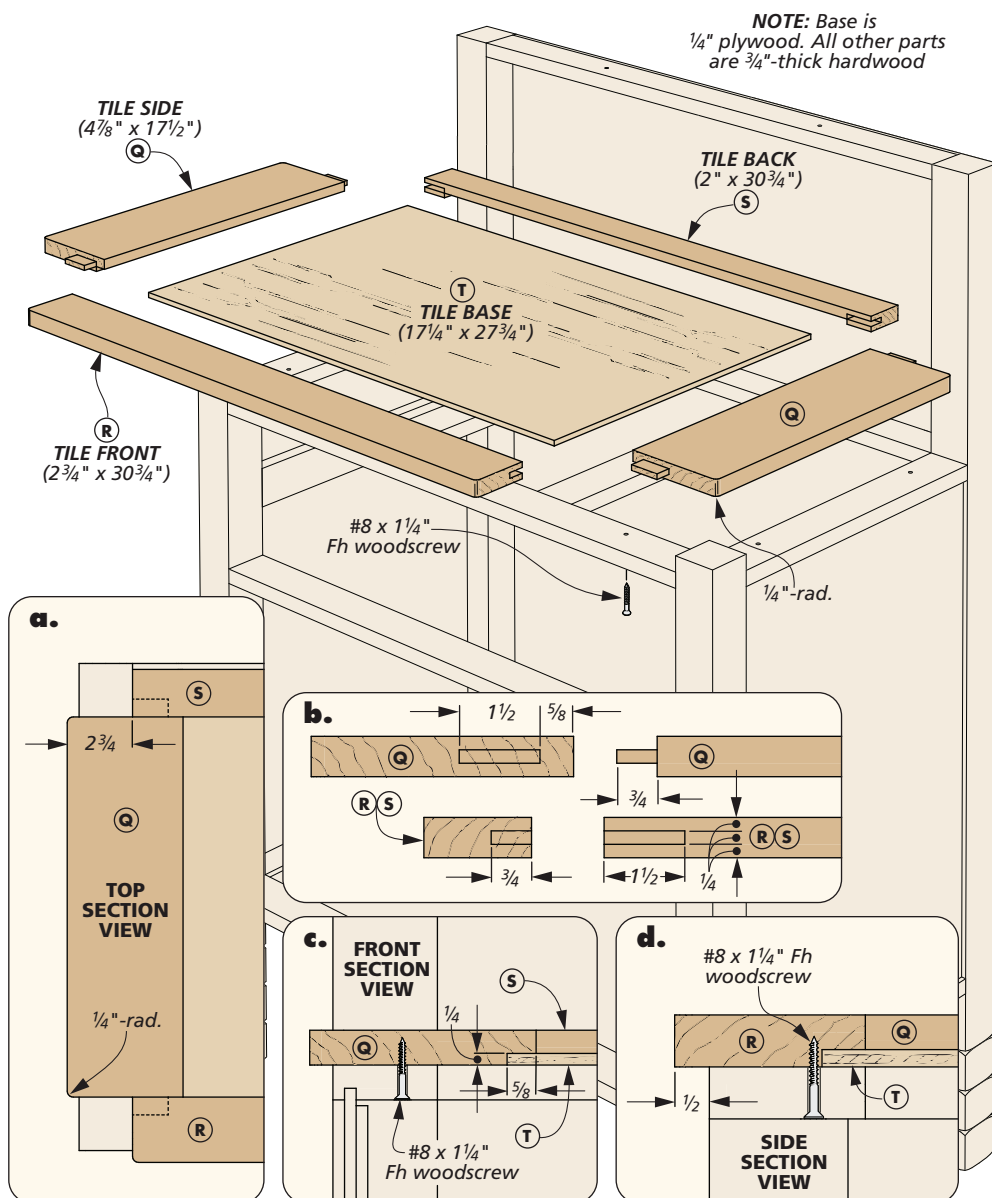
TILE FRAME

The tile that sits flush in the top on the bar is recessed in the frame you see in the drawing to the right. Notice that the sides are a lot wider than the front and back workpieces. Making the frame this way creates a precise notch in the corner of the frame that fits perfectly over the legs (detail 'a'). There's also a rabbet on the underside of the frame to hold the tile base.

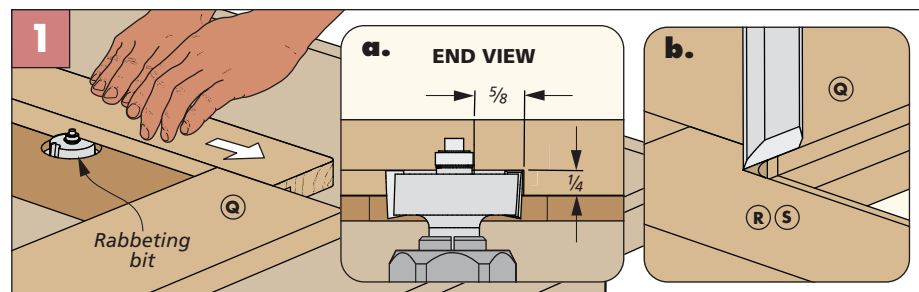
CUT TO FIT. The main drawing, as always, shows the length of each workpiece. I would suggest that you don't completely rely on that number.

You should cut the front and back frame pieces to fit snugly between the legs. The joint between the legs and the tile frame is visible, so you want it to be as seamless as possible. The tenons on the ends of the sides won't let you use the fitting technique on these pieces. So sneak up on the fit.

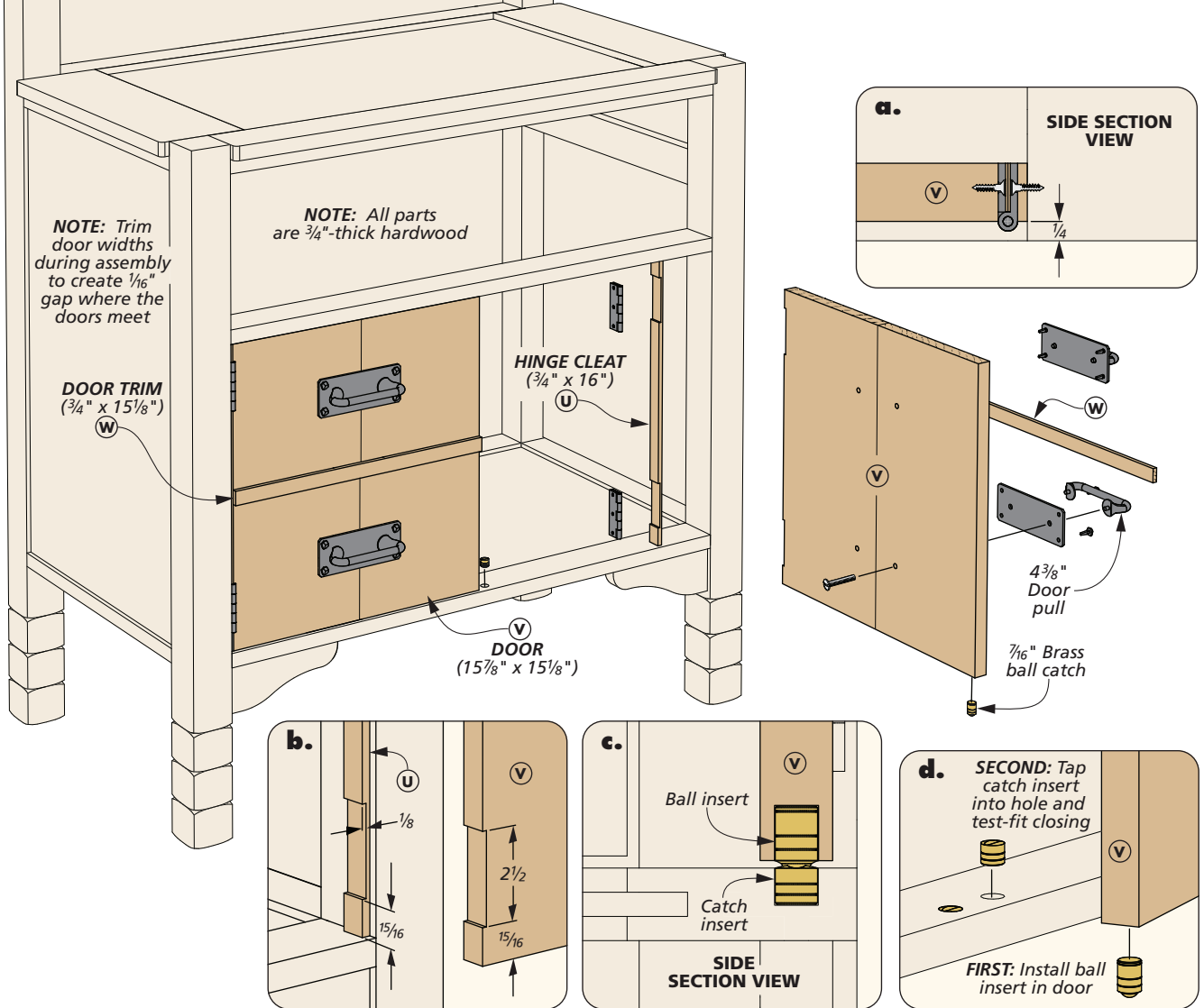
After the frame is glued up, follow the steps in Figure 1 to make the rabbet on the underside of the frame. Glue and pin nails will hold the plywood tile base in the tile frame. Screws attach the frame to the cupboard case. Now you have some doors and a drawer to build.



RABBETING THE TILE FRAME



Use Your Router Table. Your router table is the ideal tool to make the rabbet that's on the underside of the tile frame. After you've made the rabbet (detail 'a'), square the corners with a chisel (detail 'b'). Then you can install the tile base with glue and pin nails.



Up next — **DOORS & A DRAWER**

It's time to give some attention to storage for the cabinet. The space in the bottom of the cabinet is hidden by the doors you see in the drawing above. Also there's a drawer that's just above the doors. The drawer provides plenty of space where you can tuck away your most compelling

temperance-defying lectures. Let's work from the bottom up.

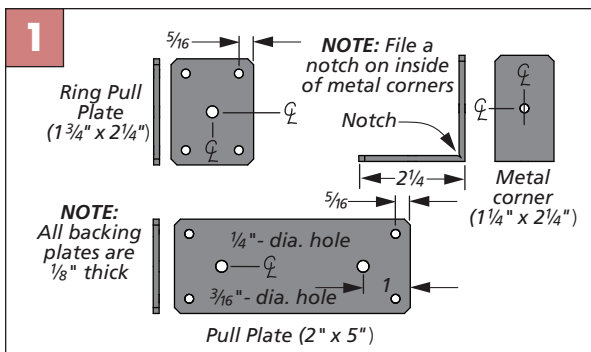
The doors on the bar look simple enough, hardwood panels that are attached to the legs with butt hinges. But on further inspection, you'll see some subtle things going on here, starting with the hinge cleats.

HINGE CLEATS. The hinge cleats you see in the main drawing and detail 'b' are thin strips of hardwood that are between the doors and legs. They serve two purposes, they allow the doors to set back from the front of the legs matching the profile of the bar sides (detail 'a'). The cleats also provide clearance for the knuckles of the hinges to swing open freely.

After gluing up and sizing the panels for the doors, you'll need to rip some thin strips of hardwood. The strips are for the hinge cleats we just looked at, along with two pieces to trim the front of the doors.

DOOR TRIM. The door trim pieces create the illusion of a bureau instead of a bar by masking the doors as two drawers. As you see in the main drawing above, the pieces are centered vertically on the doors. A little glue and some pin nails are all it takes to attach the trim to the doors.

Also, in main drawing and detail 'b' you're going to need to mortise the door and the hinge cleat. Once the cleats are in place and the doors are hung, you can



add the pull hardware. The pulls affirm the illusion of drawers instead of doors. The backing plates for the pulls are the first of the metalworking tasks. Figure 1 on the previous page provides the details for the plates and the metal corners.

BALL CATCHES. To complete the doors you'll add the ball catches. Details 'c' and 'd' on the previous page show the placement of the catches. I set the ball insert in the door first. Then tap in the catch insert a little at a time until the fit is snug.

THE DRAWER

The drawer for the bar is generously sized. The hardware is the same as the doors.

The drawer rides on hardwood guides (detail 'c') that are screwed to middle side rails on the inside of the case (detail 'd'). As for the joinery, the drawer sides have rabbets to receive the drawer front and back. Hardwood dowels are added to strengthen the joint. All in all, it's a sound, simple, well-designed drawer that will last a long time. Let's start by sizing all the parts. Then it's on to machining the sides and front.

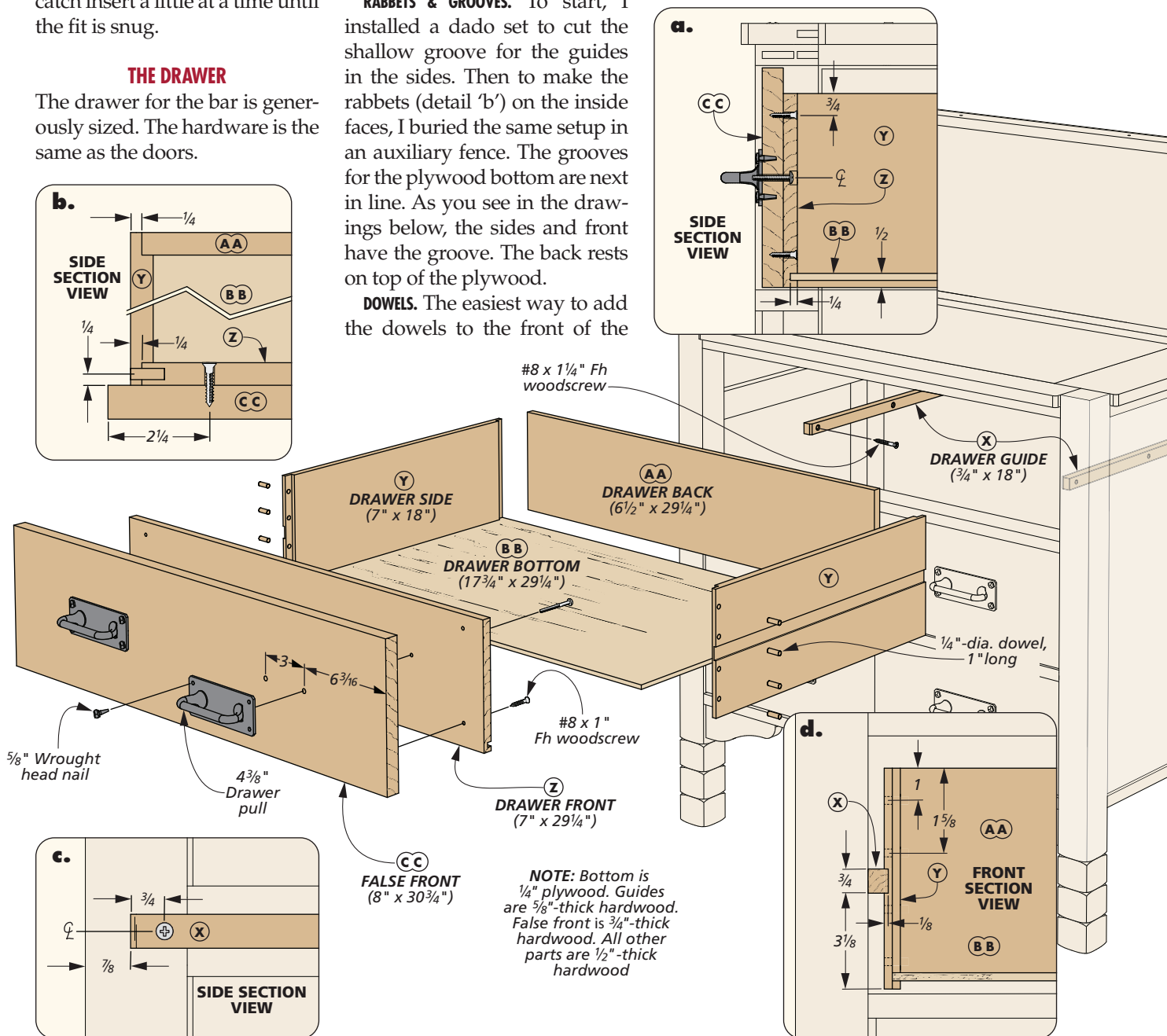
RABBETS & GROOVES. To start, I installed a dado set to cut the shallow groove for the guides in the sides. Then to make the rabbets (detail 'b') on the inside faces, I buried the same setup in an auxiliary fence. The grooves for the plywood bottom are next in line. As you see in the drawings below, the sides and front have the groove. The back rests on top of the plywood.

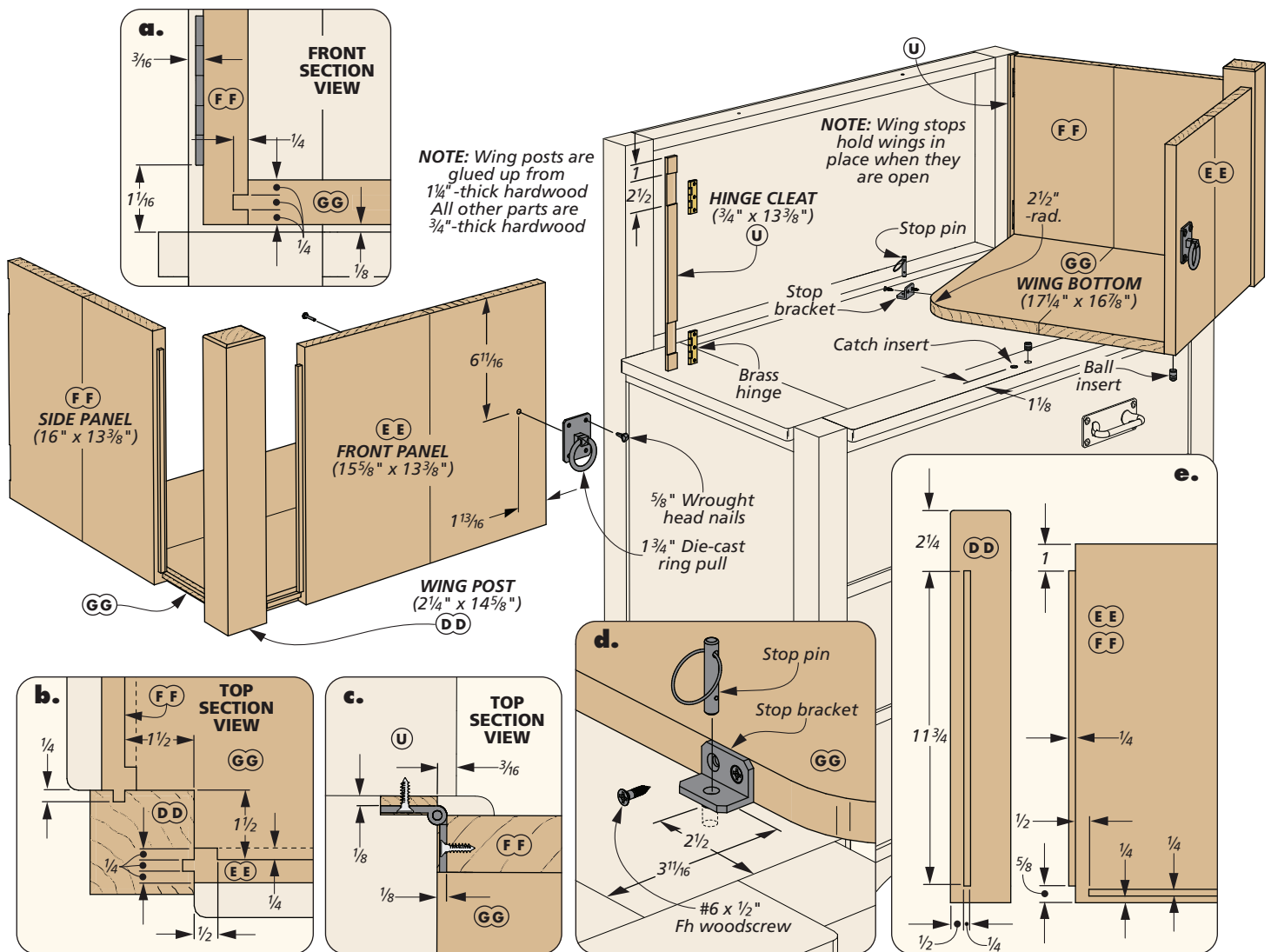
DOWELS. The easiest way to add the dowels to the front of the

drawer is to first glue up the drawer. After the glue is dry, drill the holes needed for the dowels and glue them in place, then sand them flush to the side.

GUIDES & FALSE FRONT. Before installing the hardwood guides, coat the top edge with some paraffin. This will help the drawer operate smoothly.

Now you're ready to attach the false front to the drawer. Lastly install the pulls. Now it's on to adding the wings and the top.





Crafting some **WINGS & A LID**

The wings you see above are the big reveal of this project. The wings, along with the lid are the actors in cahoots to create the deception at the heart of the bar.

Each wing is made of a post that's joined to a bottom and two vertical panels. The wings are attached to the back legs of the bar the same way you attached the doors — butt hinges and a hinge cleat. This setup doubles the working surface of the bar when the wings are fully open.

When in the closed position, the lid nestles down around the wing posts removing the bar and all its accessories from sight. To start, glue up, then trim to size the panels, and set the lid aside.

POSTS FIRST. Remember, the posts you see in the main drawing above were an intentional remnant from the front leg. You can match the grain of the cut-off to its parent leg if you desire. (Although, if you paint the bar, this effort won't matter.)

GROOVES. After cutting the posts to length, head over to the router table with them in tow. Details 'b' and 'e' above show the stopped grooves you need to make. The process is done the same way you made the stopped groove on the bottom of the inside face of the front and side panels (detail 'e').

TONGUES NEXT. Now that you're done at the router table, head on over to the table saw to make some tongues. The main drawing and detail 'b' above shows what you're up against. Once you've trimmed the tongues to length, and notched the wing bottoms (detail 'b'), you're ready to glue up the wings.

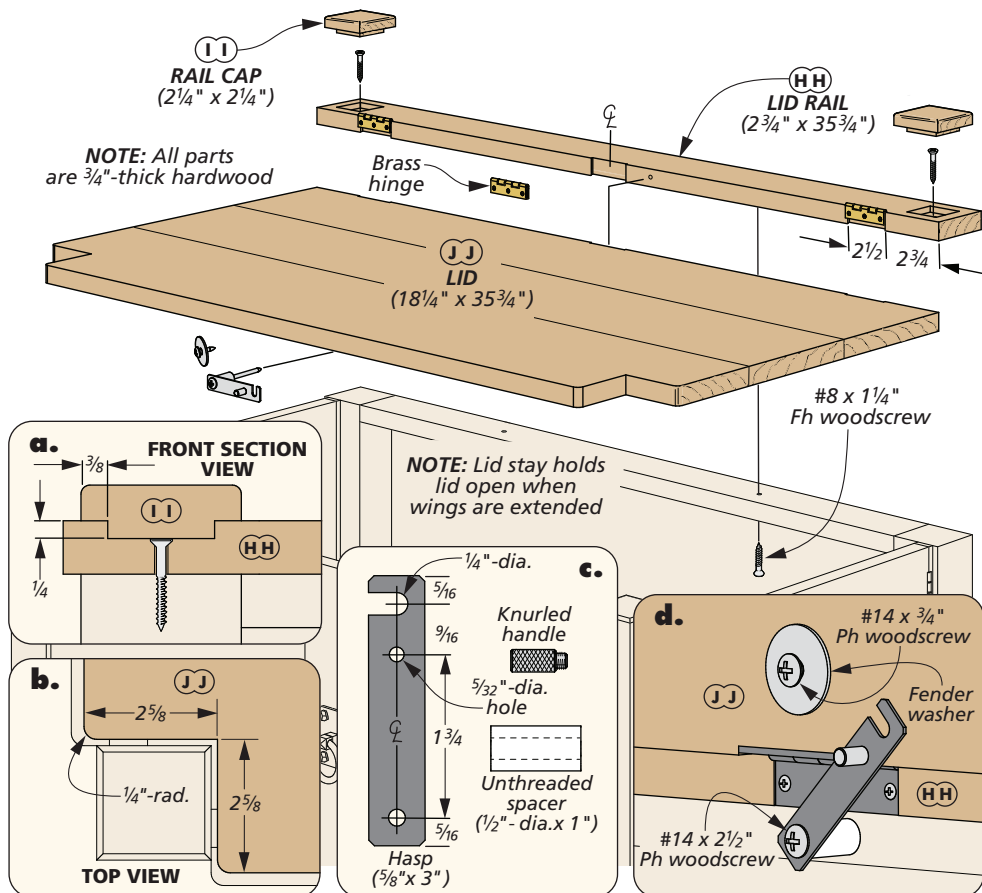
The glueup is straightforward. You can drill the holes in the wings for the ball insert while the glue dries. Now let's walk through how to attach the wings to the bar.

TEST FLIGHTS. The goal when attaching the wings is to have the wing posts aligned to the front legs when they are closed.

The problem is that you can't adjust the hinges when the wings are closed. To remedy this, I tackled one problem at a time. I mortised the wings and hinge cleats (detail 'c' on previous page). Then I screwed the hinges to the wings. To support each wing while it's open, I used my outfeed roller stand.

Without locking the hinge cleat in place, screw through it into the leg. Now close the wing and look over the results. If everything lines up, you live a charmed life. Just open the wing and pin-nail the cleat in place. If not, you might have to maneuver the location of the cleat for a perfect fit. This could involve filling screw holes in the cleat and leg. But the final fit is worth it, trust me.

To wrap up, drill the hole for the catch insert and install the ball catch. When that job is done, it's time for the lid and some more metalworking.



THE LID

Topping off the bar is the lid. As you see in the drawing above, it's a hardwood panel that's notched on the front corners to allow for the wing posts. It's attached to the bar via the lid rail.

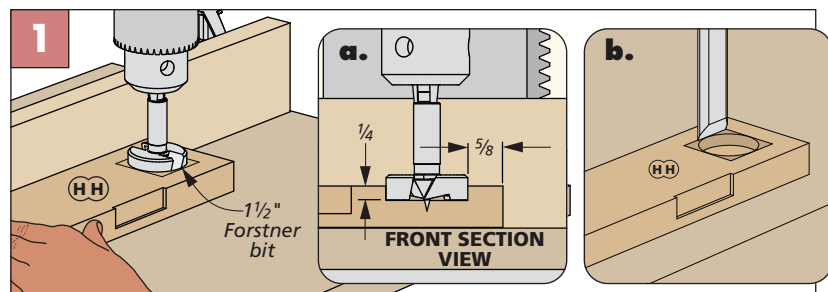
LID RAIL. The lid rail has two decorative caps in the ends. The box

below shows how to machine those parts. Before screwing the lid rail to the bar, I cut the mortises for the lid hinges.

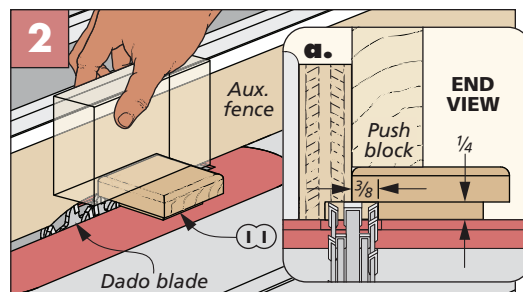
To fit the lid perfectly, I sat it on the wings and aligned it to the lid rail. I marked the location of the hinges, cut those mortises, and screwed the lid to the rail.

METALWORKING PART 2. The wing stop you see in detail 'd' on the previous page, and the lid stay in details 'c' and 'd' above provide another break from woodworking. Both parts stabilize the wings and lid while you're working on a cool concoction. Now it's on to some final details.

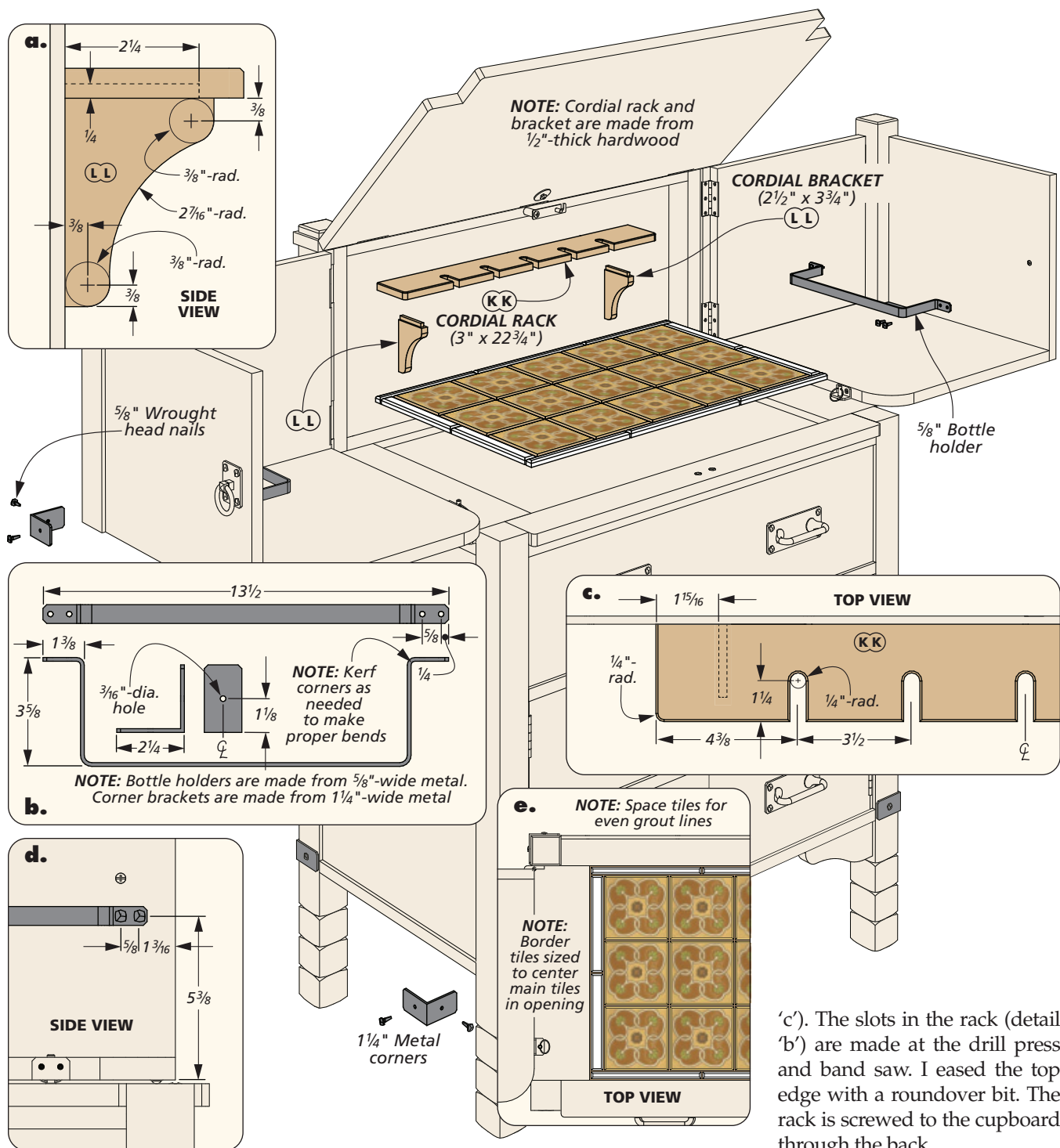
MAKING THE LID RAIL & RAIL CAP



Mortises in the Lid Rail. The lid rail needs mortises at both ends for the rail caps. A Forstner bit in your drill press will do most of the work removing the waste. All that's left for you is cleaning up the corners with a chisel (detail 'b').



Rabbet the Cap. To safely cut the rabbets in the rail cap requires the push block you see here. Rotate the cap after each pass.



Wrap it up with **FINAL DETAILS**

There's just one bit of wood-working left to do — the cordial rack you see in the main drawing above. There's a fun little hat trick to wrap up this project. You're going to bend some metal, set some tile, and finish up with a multi-layered painting and

finishing process that will make the cabinet glow. Impressive.

CORDIAL RACK. The cordial rack provides a place to store those long-stemmed glasses safely away. The rack has stopped dados on the underside to join to the brackets (details 'a' and

'c'). The slots in the rack (detail 'b') are made at the drill press and band saw. I eased the top edge with a roundover bit. The rack is screwed to the cupboard through the back.

METAL MAYHEM. It's time again to pull out your metalworking tools for a little fun. First up are the bottle holders. The holders provide a safe way to stow the spirits in the wings. Also, there are a handful of corner brackets to make, you might as well jump on them, too. Now you can turn your attention to some tiling that needs to be done.

TILE TOP

The tiles that sit in the tile frame (and the border tiles) are up next. Do a dry layout of the tiles in the opening. Mastic is the best way to hold the tiles in place. Then use sanded grout to cap it off.

THE FINISH. The finish flows as follows. Two coats of milk paint, that, when dry, get covered with one coat of topcoat. When that layer is dry, apply a glaze with a sponge pad, and wipe it down with clean rags. It's wise to use

an extender in the glaze to buy a little time. Two more layers of topcoat with light sanding in between completes the cupboard. Now it's time to enjoy this little oasis — *after* your day in the shop. **W**

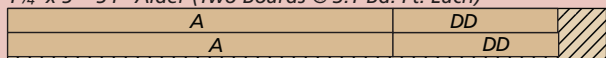
Materials, Supplies & Cutting Diagram

A Front Legs (2)	$2\frac{1}{4} \times 2\frac{1}{4}$ - 36	S Tile Back (1)	$\frac{3}{4} \times 2$ - 30 $\frac{3}{4}$	KK Cordial Rack (1)	$\frac{1}{2} \times 3$ - 22 $\frac{3}{4}$
B Back Legs (2)	$2\frac{1}{4} \times 2\frac{1}{4}$ - 49 $\frac{1}{2}$	T Tile Base (1)	$\frac{1}{4}$ ply. - 17 $\frac{1}{4} \times 27\frac{3}{4}$	LL Cordial Brackets (2)	$\frac{1}{2} \times 2\frac{1}{2}$ - 3 $\frac{3}{4}$
C Lower Side Rails (2)	$\frac{3}{4} \times 2\frac{1}{4}$ - 17 $\frac{1}{2}$	U Hinge Cleat	$\frac{1}{4} \times \frac{3}{4}$ - 60 rgh.		
D Middle Side Rails (2)	$\frac{3}{4} \times 2$ - 17 $\frac{1}{2}$	V Doors (2)	$\frac{3}{4} \times 15\frac{7}{8}$ - 15 $\frac{1}{8}$		
E Upper Side Rails (4)	$\frac{3}{4} \times 2\frac{1}{4}$ - 17 $\frac{1}{2}$	W Door Trim (2)	$\frac{1}{4} \times \frac{3}{4}$ - 15 $\frac{1}{8}$		
F Side Panels (2)	$\frac{1}{2}$ ply. - 16 $\frac{1}{2} \times 25\frac{1}{4}$	X Drawer Guides (2)	$\frac{5}{8} \times \frac{3}{4}$ - 18		
G Btm. Front Stretcher (1)	$\frac{3}{4} \times 2\frac{1}{4}$ - 32 $\frac{1}{4}$	Y Drawer Sides (2)	$\frac{1}{2} \times 7$ - 18		
H Btm. Back Stretcher (1)	$\frac{3}{4} \times 2$ - 32 $\frac{1}{4}$	Z Drawer Front (1)	$\frac{1}{2} \times 7$ - 29 $\frac{1}{4}$		
I Drawer Divider (1)	$\frac{3}{4} \times 2\frac{1}{4}$ - 32 $\frac{1}{4}$	AA Drawer Back (1)	$\frac{1}{2} \times 6\frac{1}{2}$ - 29 $\frac{1}{4}$		
J Front Stretcher (1)	$\frac{3}{4} \times 2\frac{1}{4}$ - 32 $\frac{1}{4}$	BB Drawer Bottom (1)	$\frac{1}{4}$ ply. - 17 $\frac{3}{4} \times 29\frac{1}{4}$		
K Stretcher Rails (2)	$\frac{3}{4} \times 2\frac{1}{4}$ - 17 $\frac{1}{2}$	CC False Front (1)	$\frac{3}{4} \times 8$ - 30 $\frac{3}{4}$		
L Back Stretcher (1)	$\frac{3}{4} \times 2$ - 32 $\frac{1}{4}$	DD Wing Posts (2)	$2\frac{1}{4} \times 2\frac{1}{4}$ - 14 $\frac{5}{8}$		
M Top Stretcher (1)	$\frac{3}{4} \times 2$ - 32 $\frac{1}{4}$	EE Front Panels (2)	$\frac{3}{4} \times 15\frac{5}{8}$ - 13 $\frac{3}{8}$		
N Corbels (2)	$\frac{3}{4} \times 2\frac{3}{4}$ - 6 $\frac{3}{4}$	FF Side Panels (2)	$\frac{3}{4} \times 16$ - 13 $\frac{3}{8}$		
O Case Bottom (1)	$\frac{1}{2}$ ply. - 17 x 31 $\frac{3}{4}$	GG Wing Bottoms (2)	$\frac{3}{4} \times 17\frac{1}{4}$ - 16 $\frac{7}{8}$		
P Case Back (1)	$\frac{1}{4}$ ply. - 30 $\frac{3}{4} \times 40\frac{1}{2}$	HH Lid Rail (1)	$\frac{3}{4} \times 2\frac{3}{4}$ - 35 $\frac{3}{4}$		
Q Tile Sides (2)	$\frac{3}{4} \times 4\frac{7}{8}$ - 17 $\frac{1}{2}$	II Rail Caps (2)	$\frac{3}{4} \times 2\frac{1}{4}$ - 2 $\frac{1}{4}$		
R Tile Front (1)	$\frac{3}{4} \times 2\frac{3}{4}$ - 30 $\frac{3}{4}$	JJ Lid (1)	$\frac{3}{4} \times 18\frac{1}{4}$ - 35 $\frac{3}{4}$		

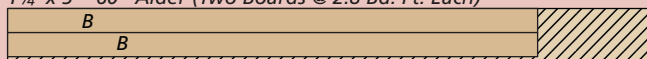
- (1) $\frac{1}{4}$ "-dia. x 12" Dowel
- (8) #8 x $\frac{1}{4}$ " Fh Woodscrews
- (27) #8 x 1" Fh Woodscrews
- (4) $\frac{7}{16}$ "-dia. Brass Ball Catches
- (2) Die-cast Ring Pulls
- (6) 4 $\frac{3}{8}$ " Drawer/Door Pulls
- (6) 2" Backing Plates for Pulls
- (2) 1 $\frac{3}{4}$ " Backing Plates for Rings
- (6) Pr. 2 $\frac{1}{2}$ " Brass Hinges w/screws
- (1) $\frac{5}{8}$ " x 3" Hasp
- (1) #14 x $\frac{3}{4}$ " Ph Woodscrew
- (1) #14 x 2 $\frac{1}{2}$ " Ph Woodscrew
- (1) 1 $\frac{1}{4}$ " Fender Washer
- (1) Knurled Thumb Screw
- (1) $\frac{1}{2}$ " O.D. x 1" Unthreaded Spacer
- (2) Wing Stop Brackets
- (4) #6 x 1" Fh Woodscrews
- (1) Stop Pin (Quick-Release Pin)
- (6) 1 $\frac{1}{4}$ " Metal Corners (Shop-made)
- (2) $\frac{5}{8}$ " Bottle Holders (Shop-made)
- (52) $\frac{5}{8}$ " Wrought Head Nails

ALSO NEEDED: One 48" x 96" Sheet of $\frac{1}{2}$ " Alder Plywood, One 24" x 48" Sheet of $\frac{1}{4}$ " Alder Plywood

1 $\frac{1}{4}$ " x 5" - 54" Alder (Two Boards @ 3.1 Bd. Ft. Each)



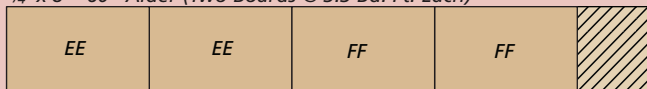
1 $\frac{1}{4}$ " x 5" - 60" Alder (Two Boards @ 2.8 Bd. Ft. Each)



$\frac{3}{4}$ " x 8" - 60" Alder (3.3 Bd. Ft.)



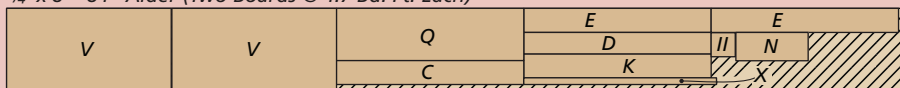
$\frac{3}{4}$ " x 8" - 60" Alder (Two Boards @ 3.3 Bd. Ft. Each)



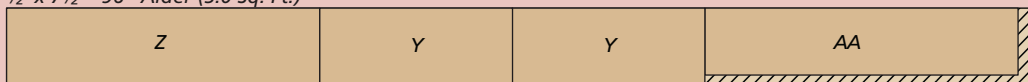
$\frac{3}{4}$ " x 6 $\frac{1}{2}$ " - 72" Alder (Three Boards @ 3.3 Bd. Ft. Each)



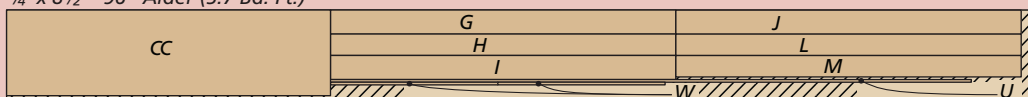
$\frac{3}{4}$ " x 8" - 84" Alder (Two Boards @ 4.7 Bd. Ft. Each)



$\frac{1}{2}$ " x 7 $\frac{1}{2}$ " - 96" Alder (5.0 Sq. Ft.)



$\frac{3}{4}$ " x 8 $\frac{1}{2}$ " - 96" Alder (5.7 Bd. Ft.)



Scissor Wall Lamp

This lamp imbues the spirit of its predecessors by combining materials, both organic and man-made — the results are illuminating.

The origin of the scissor lamp can be traced back to the German art school known as Staatliches Bauhaus in the early 19th century. Founded by architect Walter Gropius in 1919, this avant-garde school was created to reunite the division of fine art and functionality, and to prioritize the elements of design. Inspired by the Arts and Crafts Movement, Bauhaus took various aspects of artistic and design pedagogy and broke down the hierarchy of the arts by developing a diverse curriculum that emphasized the inextricable link between “fine” art and “applied” art.

So, it's these principles I embrace and apply in this project you see here — a marriage of materials — combining aesthetics with everyday function. Offering 3-way adjustability, this lamp will complement any space where extra light is needed. Stainless steel, a modest amount of wood, and some simple hardware are all it takes to get started. You will find that most pieces are “like parts” accompanied with templates, which provide for a quick and easy setup. The wishbone-shaped shade frame is accomplished in a two-part bending process involving some combustion. And if the wiring has you strained, fear not, the cord set comes preassembled. Let's get started.



▲ To keep the cord neatly organized, it's fed through a series of loop clamps to allow for full extension of the scissor mechanism.

▼ There is no limit to the number of color combinations for the cord, or material used for the shade. With the shade designed to be easily changed, mix and match fabrics to suit your own décor.



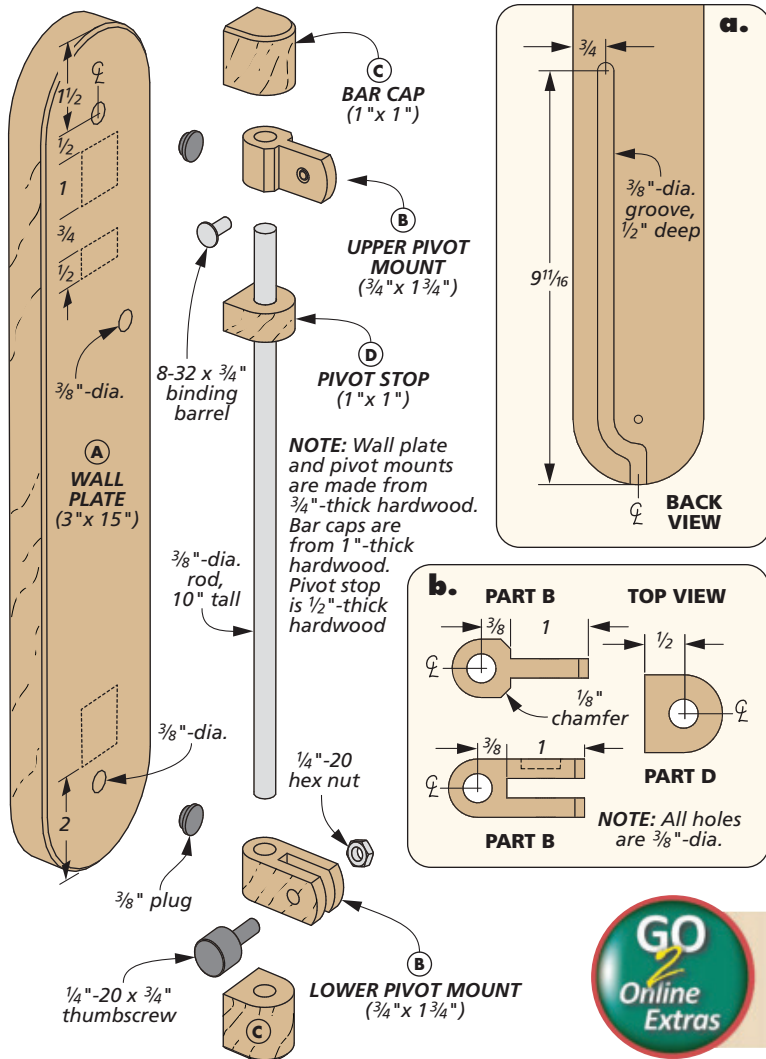


Create the REACH

As with any project, the best place to start is with material selection. Since there are a couple of components that are bent using heat (which we'll address later on), it's important to select a wood that is suitable for this process. With the scale of this project being modest in size, I was able to cut all of the pieces from a single 4/4 board of rift sawn white oak.

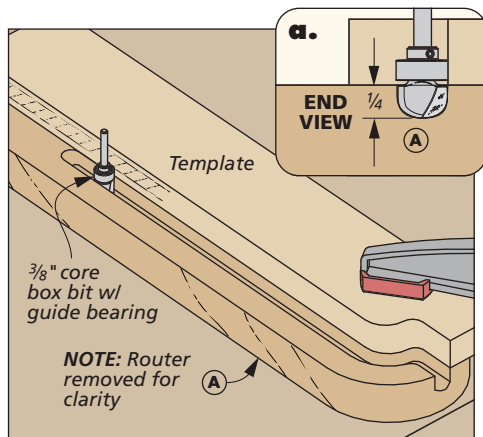
MOUNTING PLATE. As you can see from the main drawing, the wall assembly serves as the attachment point for the scissors mechanism and consists of seven parts. Begin by cutting your wall plate to size and shape. Then, using a plywood template (shown in the lower left drawing), rout a groove on the backside of your piece using a $\frac{3}{8}$ " core box bit with a guide bearing. This convenient channel, as shown in detail 'a,' is created to contain and conceal the cord. Complete the mounting plate by drilling the two counterbored mounting holes as well as the one that houses the cord.

PIVOT MOUNTS. Now it's time to start creating the pivoting components. Keep your pieces square and begin drilling all of the necessary holes over at the drill press (detail 'b'). You will notice that there is a recess that receives a low-profile hex nut for both pivot mounts. This was done



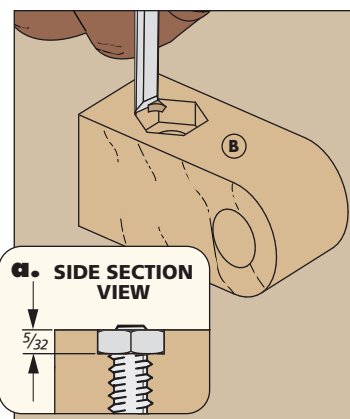
Pattern for the electrical cord groove available at:
WoodsmithSpecials.com

CONCEAL THE CORD

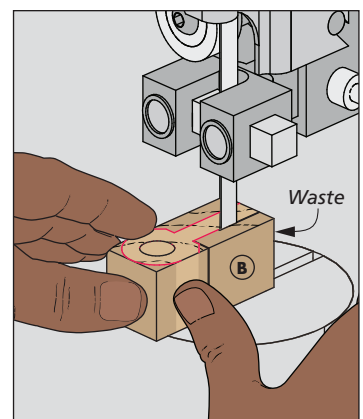


Routing the Cord groove. To create the cord groove, follow the $\frac{1}{2}$ " thick plywood template using a $\frac{3}{8}$ " core box bit with an upper bearing.

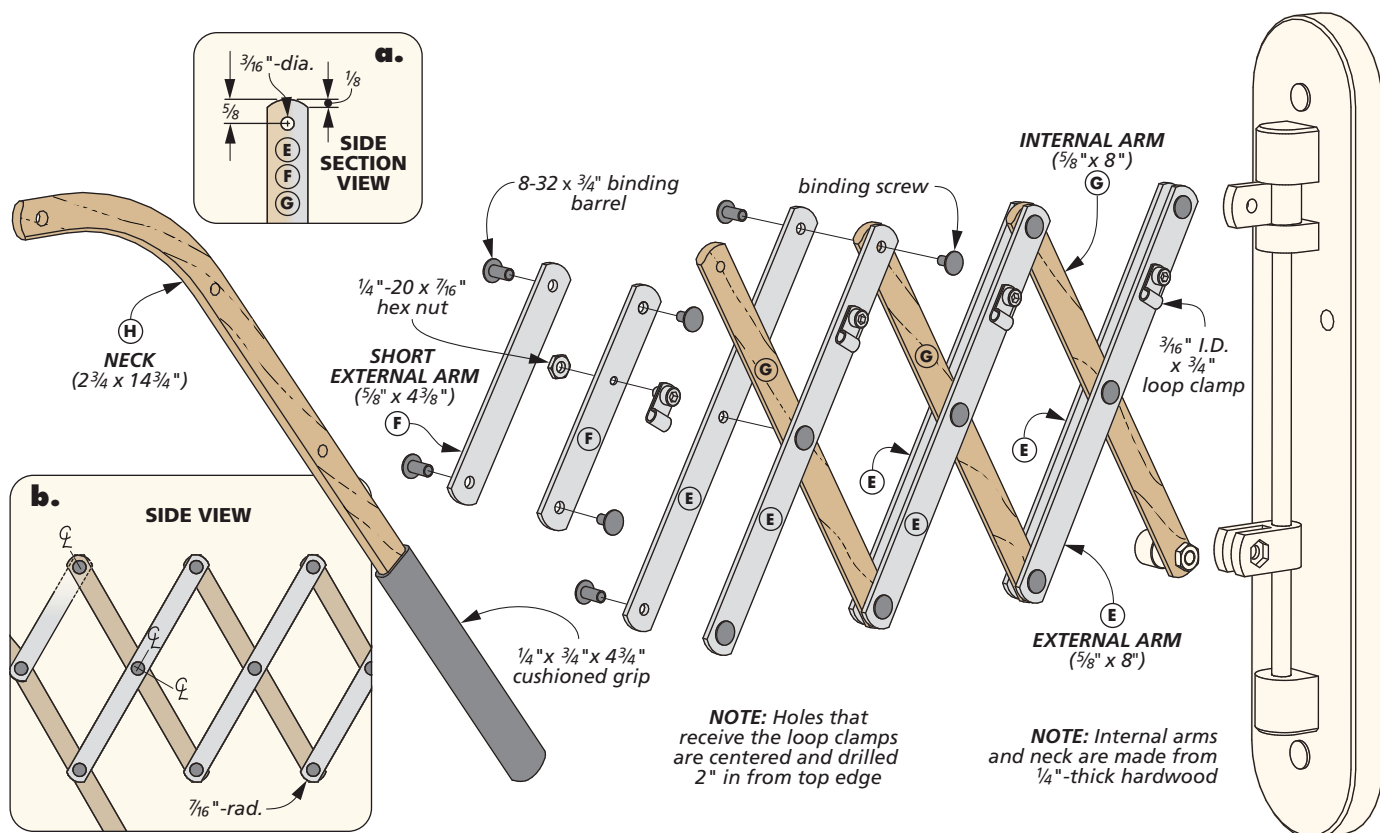
PIVOT & MOUNTING PARTS



Two-Part Removal. Start with a counterbore $\frac{5}{32}$ " deep. Then, finish up the hexagonal walls with an $\frac{1}{8}$ " bench chisel.



Band Saw the Tenons. Once the holes are drilled, finish up the tenons and profiling at the band saw.



to accept a thumb screw which allows the lamp to be locked in various positions. Finish up the joinery on the upper and lower pivot mounts using the band saw. All of the rounded profiles were created free-hand using

an edge sander. Set these parts aside and turn your attention towards the scissor mechanism.

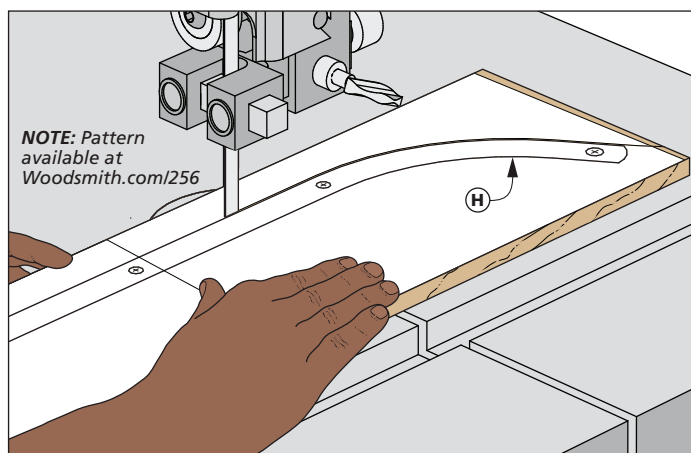
ARMS & NECK

The stainless steel bars need to be cut to length, shaped, and

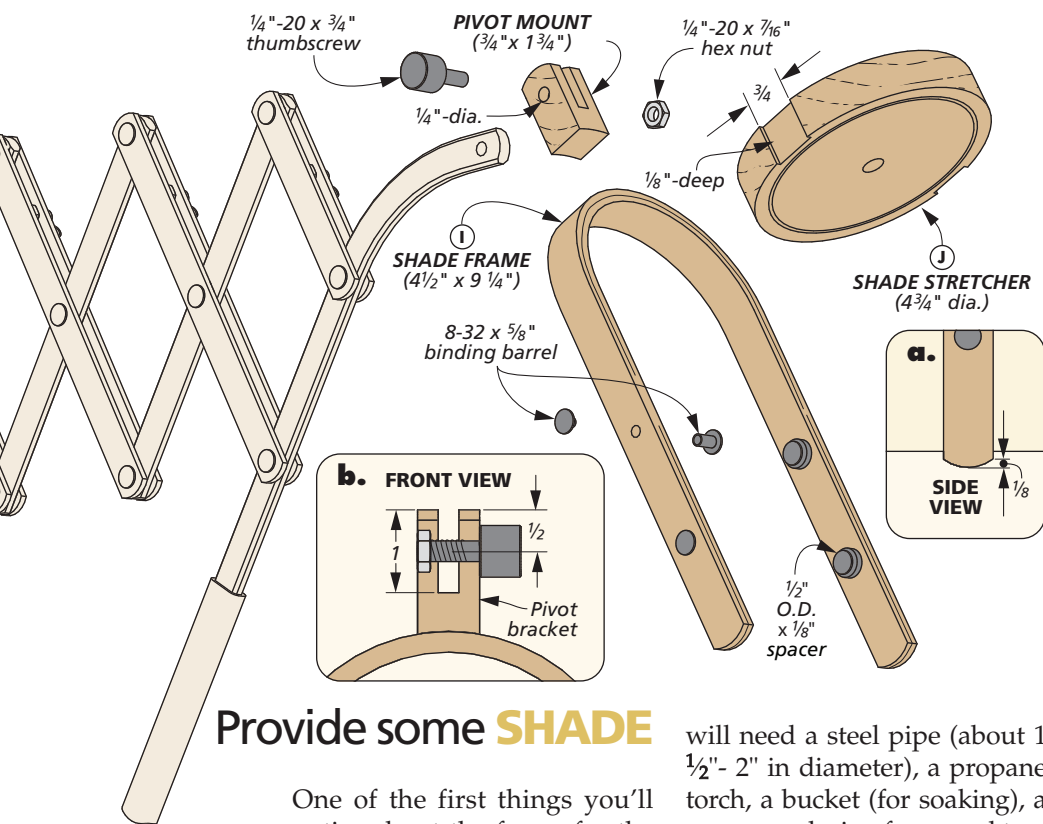
drilled. Proceed to mill all of the wood components at this time — including the neck (refer to lower left drawing). Once you have all of the pieces cut, head back over to the drill press and create the holes that will accept the binding posts. For this step, I printed off full-size patterns (available at Woodsmith.com/256). This provided me with not only the information for the profiled ends, but also the center points for the drilling locations. The same can be applied for both the internal and external arms.

Stainless steel can be difficult to work, so when drilling, swap out your traditional H.S.S. bit for a cobalt bit. They retain their hardness at higher temperatures, thus providing you with a “cleaner” and more precise hole. Additionally, make use of a 3-in-one oil or cutting lubricant while drilling to prevent friction and heat buildup. This will make drilling easier and protect the longevity of your bits.

SHAPING THE NECK



Band Saw the Neck Shape. Make use of full-scale patterns to prevent extraneous layout. As a bonus, they provide the blueprint for the shape of the neck as well as the drilling center points.



Provide some SHADE

One of the first things you'll notice about the frame for the shade is its horseshoe shape. To achieve this result, we employed a method of bending wood with the assistance of a hot pipe. For this process you

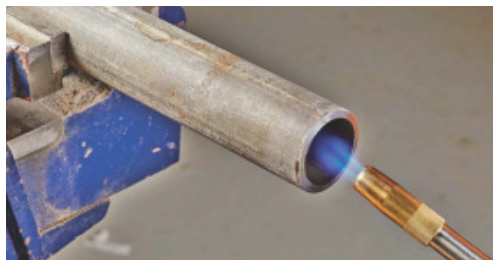
will need a steel pipe (about 1 1/2"- 2" in diameter), a propane torch, a bucket (for soaking), a sponge, a drying form, and two 1/8" thick strips of veneer. On that note, it is worth mentioning that I chose to oversize my veneer strips (3/4" x 26"). This was done to help establish an inconspicuous glue line, as well as a solid bond. Start by soaking the strips of wood in a bucket of warm

water for a few hours. This helps to soften the lignin, thus making the wood more pliable. Then, begin to heat the pipe up to temperature using a propane torch. When the desired temperature is achieved, start to work the saturated veneers across the hot pipe, using the drying form as your guide. Continue by clamping the newly formed strips around the form (shown below) and allow them to dry for 24-48 hours. Once they are dry, it's time to give them their final shape. The glued strips are clamped into the same form.

REFINING THE FRAME. After the glue has cured on the lamination, you can cut the frame to its final size. First, crosscut the frame to length using the drying form as a "prop". Then, with the assistance of your form, rip the width of the frame using the band saw.

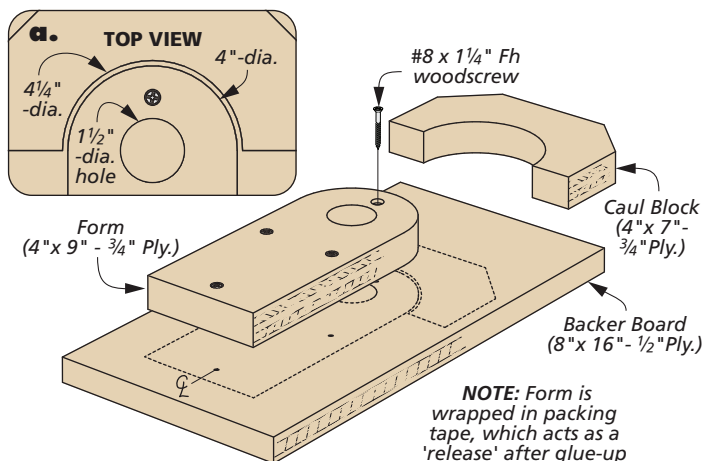
LIGHT THE WAY. To give the frame rigidity, a "bridge" or stretcher was created. You will notice a notch is cut on both sides of the disc to position the frame on the stretcher. On the underside, there is a shallow groove which will house the

THAT'S SO HOT

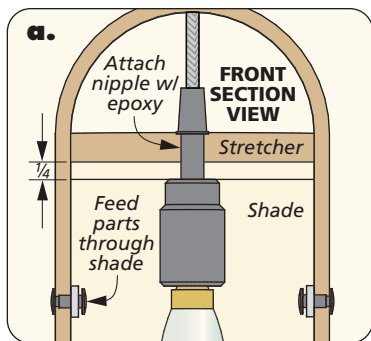


▲ **FIRE & PIPE.** Heat the pipe up to about 215° Fahrenheit. If the water beads off rather than evaporating, you are good to go.

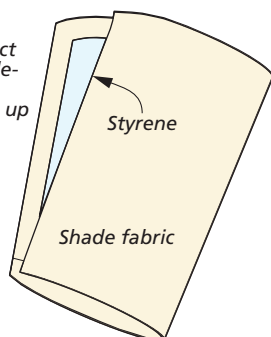
SHAPE & DRY



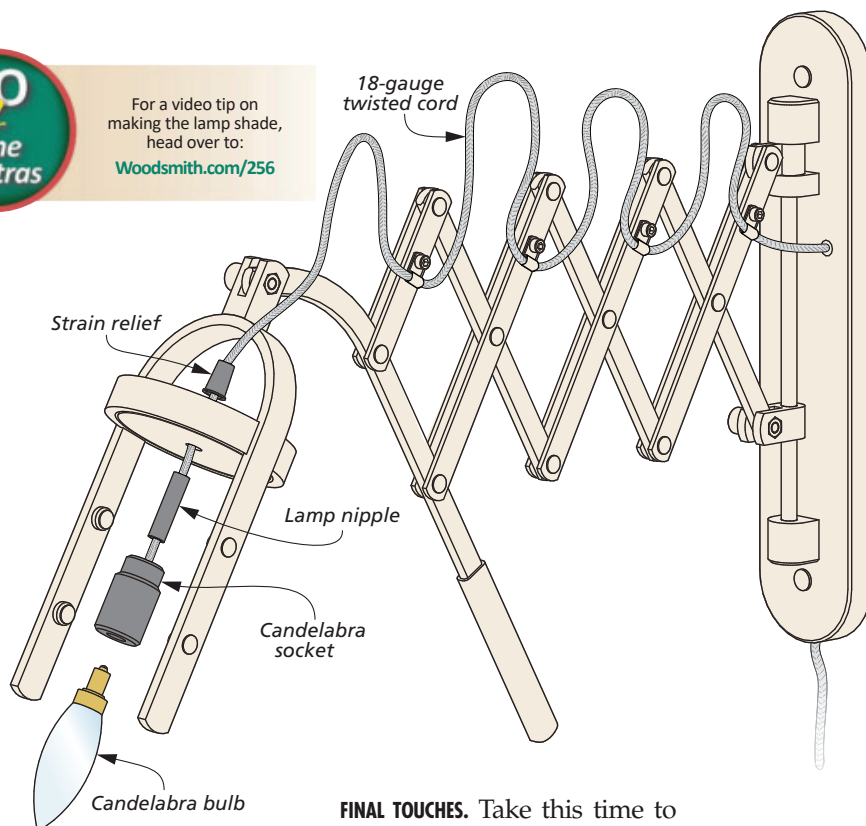
Drying Form. With the veneers bent to your satisfaction, continue by clamping them around the lamination form to dry for 24-48 hours. Once dry, apply some glue and re-clamp them using the same form.



NOTE: Material thickness may affect the final fit. Double-check before committing to glue up



For a video tip on making the lamp shade, head over to:
Woodsmith.com/256



shade. First, rough cut the shape of the stretcher using the band saw. Then, with the assistance of a radius-cutting jig, refine the profile using a straight bit at the router table.

Lastly, there is a $\frac{3}{8}$ " centered hole that functions as an attachment point as well as a conduit for the wiring. Once the stretcher has been attached, proceed to adhere the second pivot mount to the top of the frame.

CREATING THE SHADE. The shade is comprised of the fabric of your choosing, lined with a piece of adhesive-backed styrene. Cut the styrene about $\frac{1}{2}$ " longer

than the circumference of the shade (about $12 \frac{1}{4}$ "). This is done to produce a finished edge once the fabric is folded over. As for the fabric, oversize this piece enough to allow for a $\frac{3}{4}$ " reveal on three sides. This will provide you with enough fabric to fold around the edge of the styrene — thus allowing for a nice clean edge. Follow this step by creating the attachment holes in the shade. Since a drill bit is fabric Kryptonite, use a $\frac{3}{8}$ " hollow punch to create the holes.

FINAL TOUCHES. Take this time to ensure all of your parts fit. For stain, I used a two-part solution of an oil-based stain with a bit of weather accelerator. After applying a couple of coats of your favorite finish, you are ready for assembly. Next, feed the cord through the back-side of the mounting plate and continue through the loop clamps and onto the socket. Now, the only thing left to do is to secure your lamp wherever you need and added bit of light. **W**



Sundial Wire is a great resource for all things "lamp-ish". With a wide selection of fully customizable cord sets; you can specify everything from, cord type, color, length, wire gauge, plug, and switch, as well as the distance of the switch from the plug all at sundialwire.com.

Materials & Supplies

- | | | |
|----------------------------------|--|--|
| A Wall Plate (1) | $\frac{3}{4}$ x 3 - 15 | • (1) $\frac{1}{4}$ " x 10" Stainless Steel Rod |
| B Pivot Mounts (3) | $\frac{3}{4}$ x $\frac{3}{4}$ - $1 \frac{3}{4}$ | • (7) $\frac{1}{8}$ " x $\frac{5}{8}$ " x 12" Stainless Steel Bars |
| C Bar Caps (2) | 1 x 1 - 1 | • (2) $\frac{1}{4}$ "-20 Stainless Steel Thin Hex Nuts |
| D Pivot Stop (1) | $\frac{1}{2}$ x 1 - 1 | • (2) $\frac{1}{4}$ "-20 Knurled-Head Thumbscrews |
| E External Arms (6) | $\frac{1}{8}$ x $\frac{5}{8}$ - 8 | • (4) Stainless Steel Loop Clamps |
| F Short External Arms (2) | $\frac{1}{8}$ x $\frac{5}{8}$ - $4 \frac{3}{8}$ | • (4) 10-24 x $\frac{5}{16}$ " Socket Head Screws |
| G Internal Arms (3) | $\frac{1}{4}$ x $\frac{5}{8}$ - 8 | • (4) 10-24 x $\frac{5}{16}$ " Narrow Hex Nuts |
| H Neck (1) | $\frac{1}{4}$ x $2 \frac{3}{4}$ - $14 \frac{3}{4}$ | • (11) Low-Profile Binding Barrel/ Screws 8-32 x $\frac{3}{4}$ " |
| I Shade Frame (1) | $\frac{3}{4}$ x $4 \frac{1}{2}$ - $9 \frac{1}{4}$ | • (4) Low-Profile Binding Barrel/ Screws 8-32 x $\frac{5}{8}$ " |
| J Stretcher (1) | $\frac{3}{4}$ x $4 \frac{1}{4}$ dia. | • (4) $\frac{1}{8}$ " Unthreaded Spacers |
| | | • (1) $\frac{3}{4}$ " x $\frac{1}{4}$ " Cushioned Rectangular Grip |
| | | • (2) $\frac{3}{8}$ " Anodized Hole Plugs |

DESIGNER Project



Casual Coffee Table

The laid-back vibe of this table invites you to put your feet up and relax — or set up for the weekly game night.

Tables invite gathering. A large dining table draws family and friends to celebrate holidays and special events. A coffee table on the other hand, tones down the rituals for laid back gatherings whether coffee-based or another beverage of your choosing.

I've noticed a recent trend that super sizes the coffee table into continent-sized altars of display. This table instead relishes small spaces and everyday gatherings. The splayed legs and aprons visible from the front add visual and woodworking interest.

Down below, there's a drawer to hold entertaining essentials, remotes, or just a place to clear the deck when company arrives. We finished the base with a two-tone distressed paint job. Think of it as a subtle permission slip to skip the coasters or put your feet up. Painting the base also allows you to use lower cost materials without apology.

The top of any table is the high-impact and high-traffic showpiece. In this case, it's made from thick, solid cherry. Breadboard ends nod in the direction of a casual, country style.

Even the details reinforce feeling at ease. There are no ornate moldings or profiles. Edges are softened just enough to feel comfortable — and to help add "authentic wear" to the paint.

The Designer Series projects aim to let you create good-looking, solidly built furniture using essential skills with a modest tool kit. It's time to start building.



Angled legs and a distressed paint scheme dial back the formality of this coffee table design. A drawer adds welcome storage and the crowning, naturally finished breadboard top (opposite page photo) adds contrast.

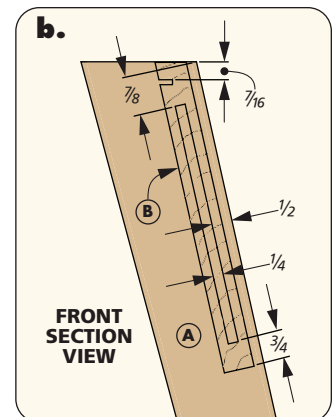
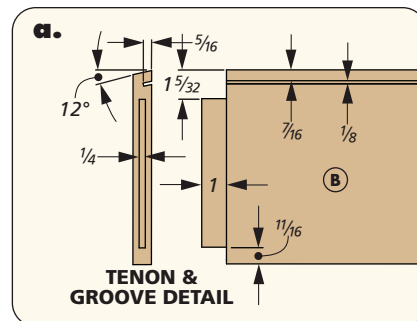
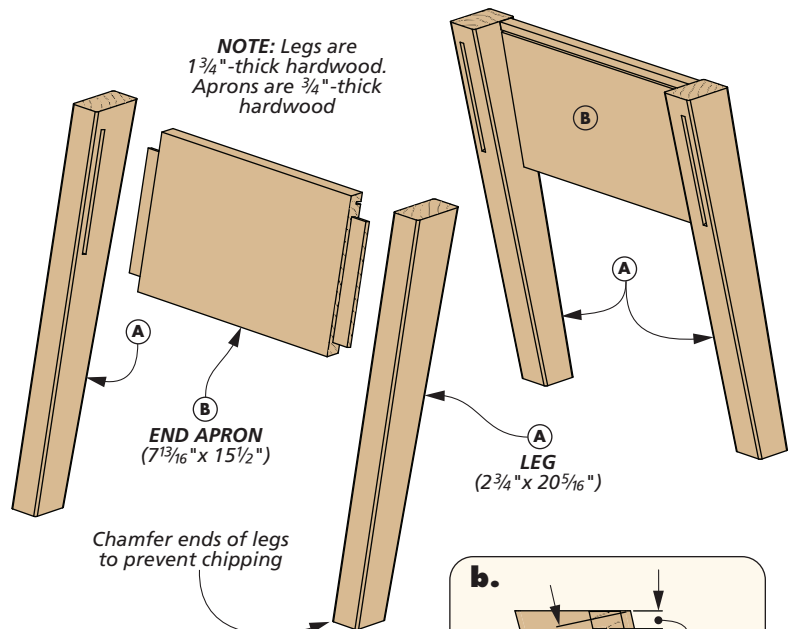
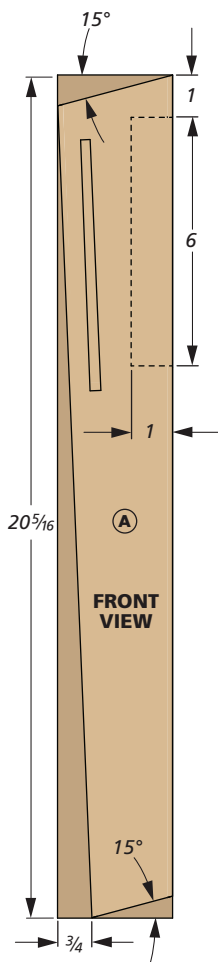
Angles & tapered LEGS

Since the angled legs form such a prominent characteristic of this table, we'll start there. I want to point out that not only are the legs angled in orientation, but also tapered from top to bottom. This is shown in the left margin drawing. This lightens the look of the legs and enhances the angled effect.

The drawing at right shows our heading — the two end assemblies. These consist of a pair of legs joined with an apron.

LEG DETAILS. Creating four leg blanks sets you on course. The top and bottom of the legs have parallel angles cut to establish their stance.

The legs connect to the aprons with mortise and tenon joints. While the sides are still parallel and square, it's a good idea to form the mortise on the inside face of the leg. These are the ones that hold the two end aprons. Figure 1 below shows a tried-and-true technique that employs a drill press to remove most of the material. You then clean up the edges and ends with a pair of chisels at the workbench. A wide chisel straightens the sides of the mortise, while a narrow chisel chops the end square.



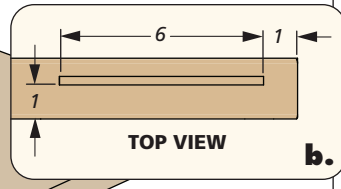
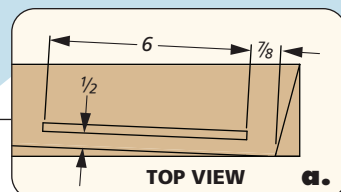
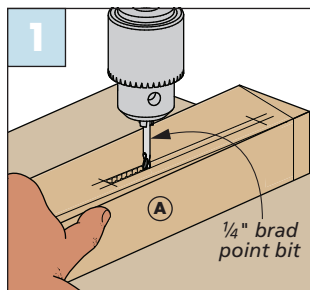
TAPER THE LEGS. Before forming the remaining mortises, you need to taper the outside edge of the legs. Figure 2 below shows how to cut the tapers with a quick-to-make taper jig.

The tapered edge serves as the

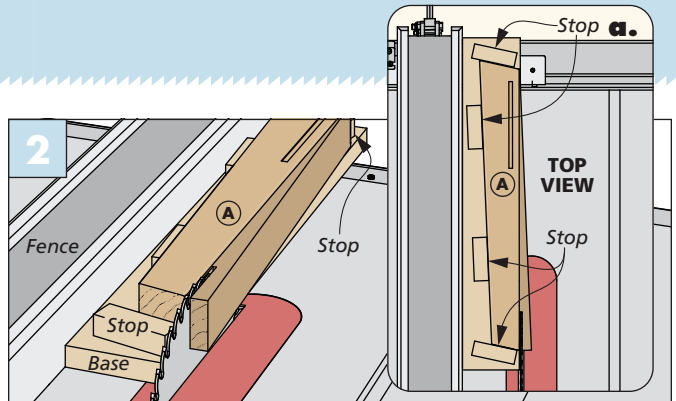
reference surface for mortises with a consistent depth.

END APRONS. The two end aprons only require a tenon cut on each end to fit the respective mortises, as in detail 'a.' The upper and lower edges are bevel ripped

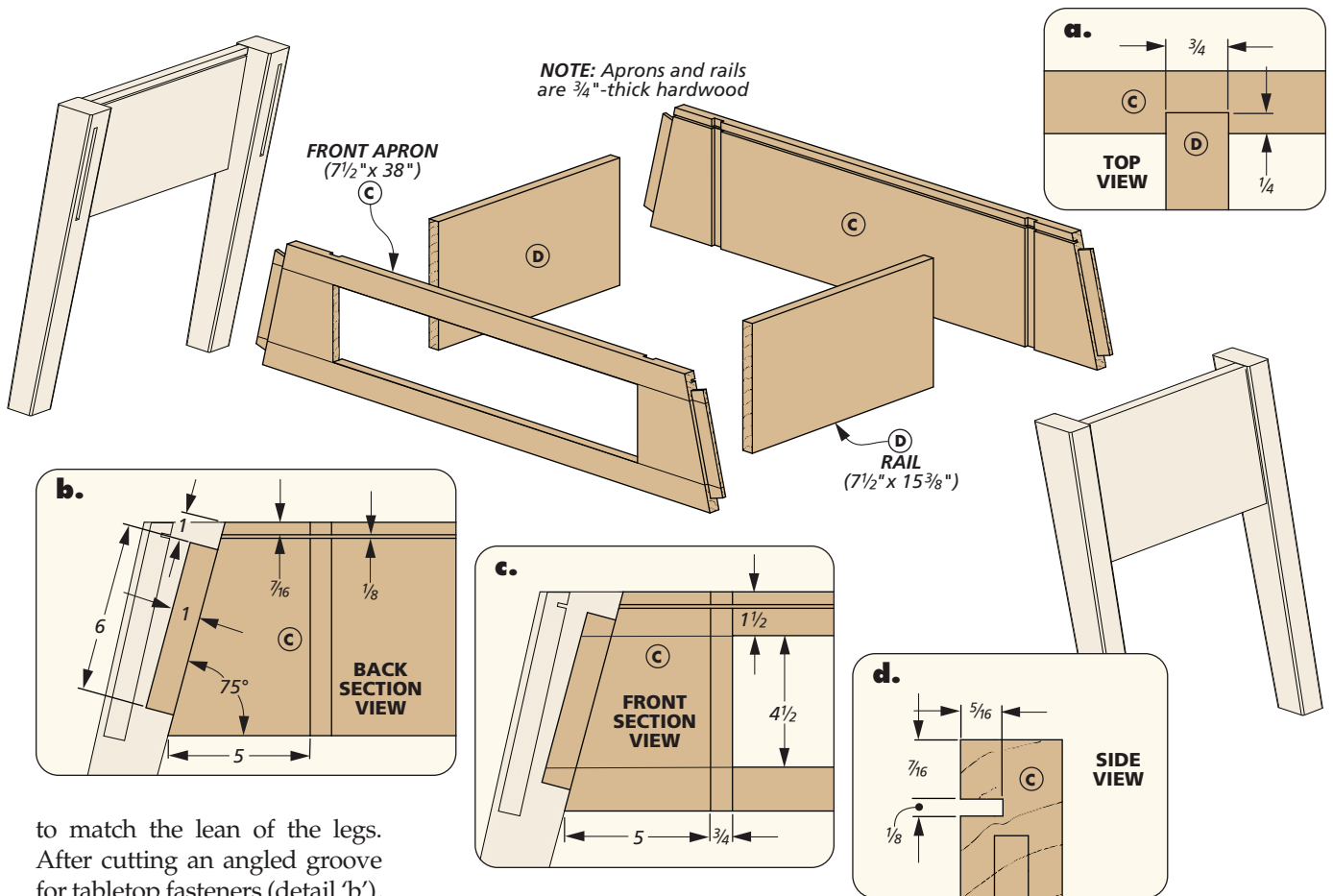
LEG WORK



Making a Mortise. Drill a long line of overlapping holes with a brad point bit. Straighten the edges with a wide chisel. It isn't necessary, but you can square up the ends as well.



Taper Jig. The taper jig consists of a plywood base with a handful of stops that position each leg in the same place for consistent tapers. The sled runs against the rip fence.



to match the lean of the legs. After cutting an angled groove for tabletop fasteners (detail 'b'), you can assemble the ends.

CENTER ASSEMBLY

The bridge between the ends makes up the front and back of the table. With it, you'll also create a pocket for the drawer, as shown in the drawing above.

FRONT APRON. The front and rear aprons are identical in finished

size. But making them is a different story. The rear apron is simply cut to size with angled ends. The box below shows how to create the drawer opening in the front apron with four cuts at the table saw.

This arrangement works particularly well if you choose to go with a clear finish on the base.

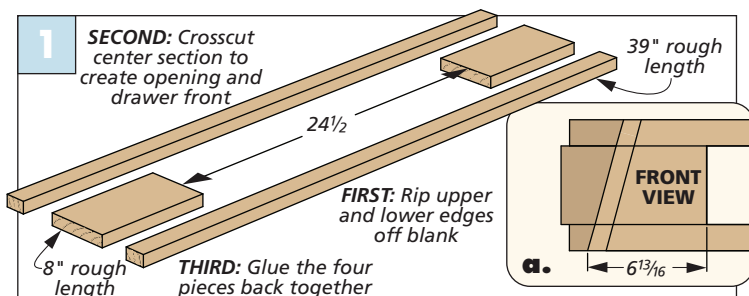
The middle section is sized for the drawer front so you have continuous grain flowing across the entire piece.

DADOES & TENONS. Joinery is up next. The inner faces of the aprons have dadoes to house the drawer rails (details 'a' and 'c'). Then you can cut tenons on the angled ends.

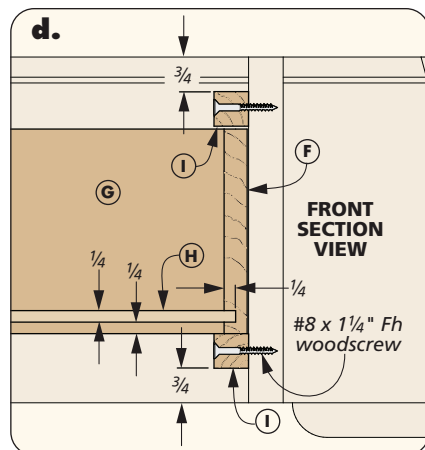
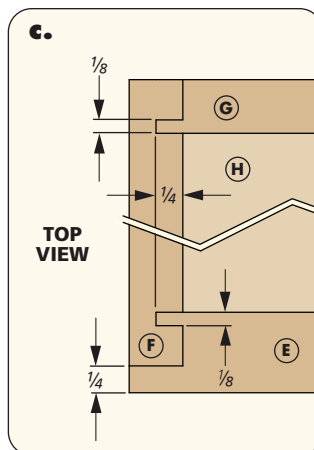
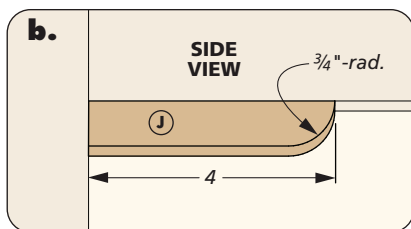
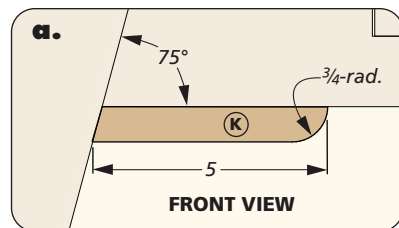
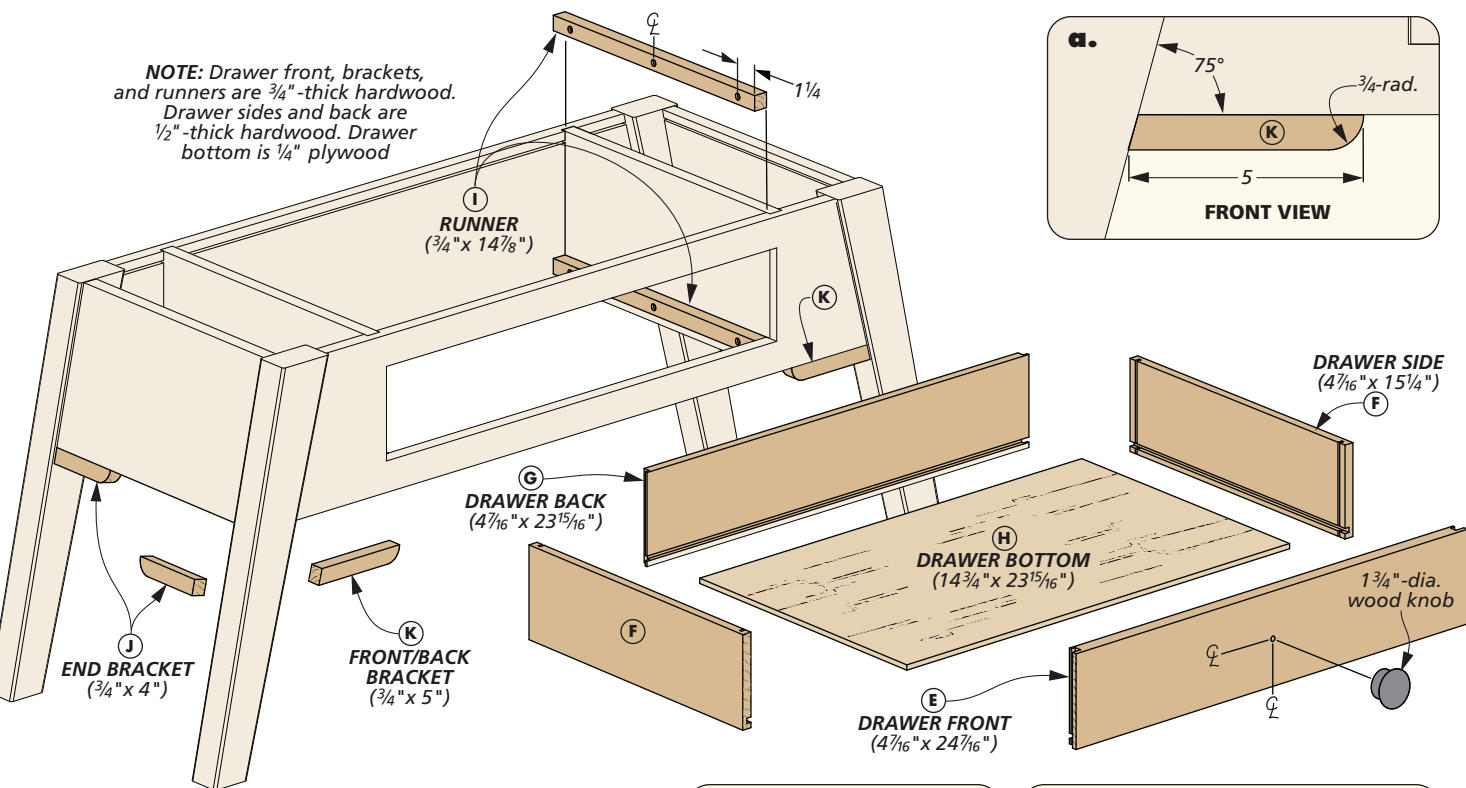
I used a dado blade in the table saw. Support the piece with the miter gauge rotated to match the angle on the end and with the rip fence set for an end stop. In order to form the end shoulders, I find that a hand saw and a chisel work better than trying to do this at the table saw.

The groove for the tabletop fasteners is easy to overlook in your haste to glue up the base, as in detail 'd.' I glued the rails to the front and rear aprons before adding the end assemblies. Your aim is a square assembly with the parts flush at the top.

FOUR-PIECE OPENING



Cut & Glue. Two long rip cuts define the height of the drawer opening. Crosscut the center section to separate the drawer front (as shown on the next page). Glue the remaining pieces back together.



A Handy DRAWER

With the structure of the table formed, you can turn towards the work of fitting it out. We'll make a drawer, add some decorative flourishes, and cap it off with the top.

DRAWER FIRST. Remember the middle piece you cut out when making the front apron? It's time to dig it out to use as the drawer front. If necessary, trim it up a bit for even reveals on all four sides.

The drawer parts are joined with a locking rabbet joint, as shown in detail 'c.' This is formed in three steps. First, cut a slot across each end of the drawer front. The depth of the slot matches the thickness of the drawer sides. Next, the inner

tongue of the slot gets trimmed back to accommodate the side.

Finally, the drawer sides have a dado cut at each end to interlock with the tongue on the front, as in detail 'c.' The drawer back has a tongue cut at each end to fit into the dados in the sides.

You can cut a groove in all the parts to accept the drawer bottom (detail 'd'). Then assemble the drawer. A round wood knob suits the tone of this piece.

INSTALLING THE DRAWER. The drawer guides that make up part of the table base keep the drawer running straight and true. What's

needed is some support from above and below. A set of runners takes on that role, as in detail 'd.' The runners are screwed to the rails to center the drawer in the opening top to bottom. Depending on drawer sizing, you may need to add a stop to the rear apron so the drawer is flush at the front.

KEEPING BRACKETS. I felt the table was feeling too square. To soften the look, I added a rounded bracket to the transition between the leg and apron. These are shown in details 'a' and 'b.' Shape the brackets on

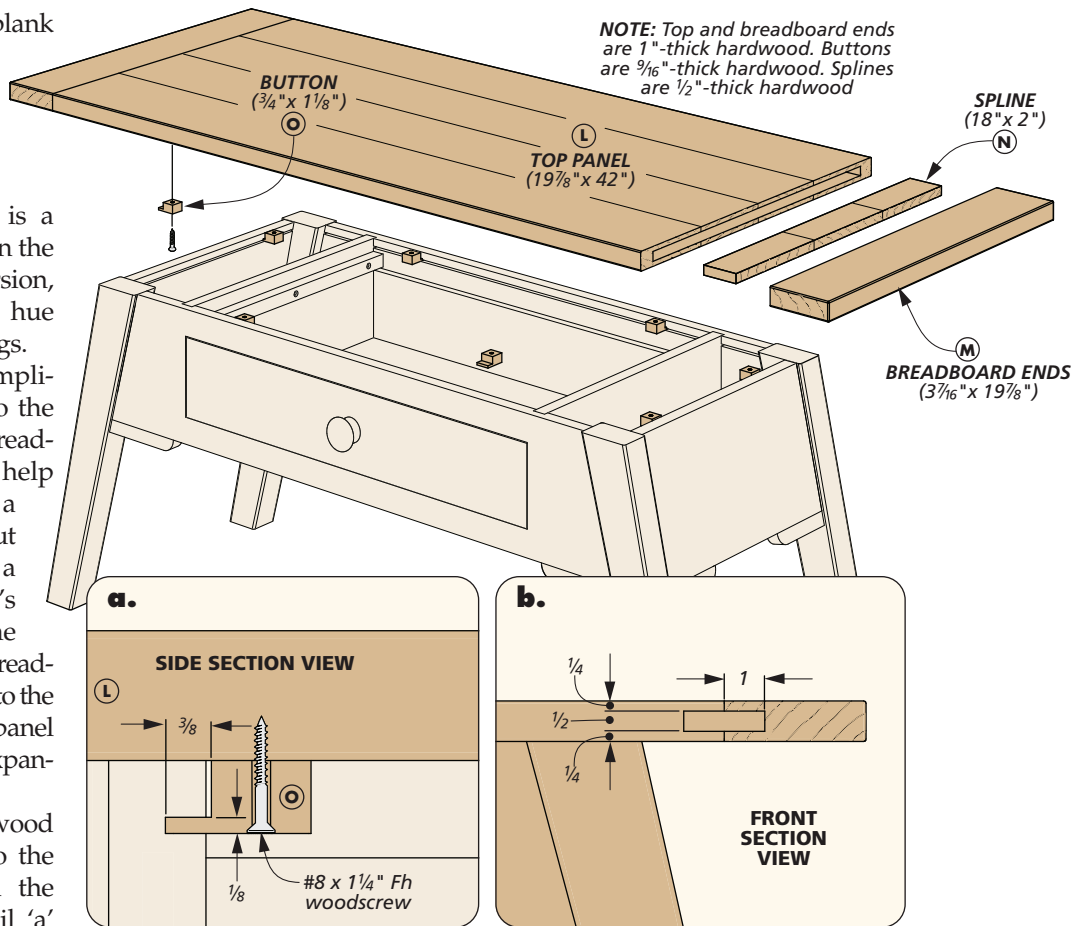
the end of an extra-long blank for safer handling. Then lop each one to length and glue it on.

BREADBOARD TOP

The crown for this table is a solid-wood top, as shown in the right drawing. For this version, I used cherry. The warm hue plays well with most settings.

Gluing a panel isn't complicated, just pay attention to the grain for seamless joints. Breadboard ends are added to help keep the panel flat and add a decorative touch. Grooves cut in the top and ends accept a spline. Note that the spline's grain direction matches the panel. When gluing on the breadboard ends, only apply glue to the middle section to allow the panel to accommodate seasonal expansion and contraction.

TABLETOP BUTTONS. Hardwood buttons connect the top to the base. A tongue slides in the apron grooves, as in detail 'a' at right. A slip fit allows the top to move. To install the buttons, flip the top upside down on your bench. Center the base on the top. Fit the buttons in the



grooves and install screws to secure the top (detail 'b').

Sources on page 66 has the details on the distressed, painted

finish I used. You can't help but relax once you place this table in the house. Grab a magazine (*Woodsmith?*) and relax. [W](#)

Materials, Supplies & Cutting Diagram

A	Legs (4)	1 3/4 x 2 3/4 - 20 5/16
B	End Aprons (2)	3/4 x 7 13/16 - 15 1/2
C	Front/Back Aprons (2)	3/4 x 7 1/2 - 38
D	Rails (2)	3/4 x 7 1/2 - 15 3/8
E	Drawer Front (1)	3/4 x 4 7/16 - 24 7/16
F	Drawer Sides (2)	1/2 x 4 7/16 - 15 1/4
G	Drawer Back (1)	3/4 x 4 7/16 - 23 15/16
H	Drawer Bottom (1)	1/4 ply. - 14 3/4 x 23 15/16
I	Runners (4)	3/4 x 3/4 - 14 7/8
J	End Brackets (4)	3/4 x 3/4 - 4
K	Front/Back Brackets (4)	3/4 x 3/4 - 5
L	Top Panel (1)	1 x 19 7/8 - 42
M	Breadboard Ends (2)	1 x 3 7/16 - 19 7/8
N	Splines (2)	1/2 x 18 - 2
O	Buttons (8)	9/16 x 3/4 - 1 1/8

- (14) #8 x 1 1/4" Fh Woodscrews
- (1) 1 3/4"-dia. Wood Knob

1" x 5 1/2" - 96" Cherry (3.7 Bd. Ft.)



1" x 6 1/2" - 72" Cherry (Two Boards @ 3.3 Bd. Ft. each)



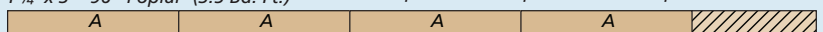
3/4" x 5" - 60" Poplar (1.7 Bd. Ft.)



3/4" x 8" - 84" Poplar (Two Boards @ 4.7 Bd. Ft. each)



1 3/4" x 3" - 96" Poplar (3.5 Bd. Ft.)



ALSO NEEDED: One 24" x 24" sheet of 1/4" birch plywood

NOTE: Front apron cut into five pieces. Back apron left in one piece



Moxon Vise

This bench-top auxiliary vise brings your workpiece to a comfortable height, and is a true staple for handwork in your shop.

A couple of months back, during a live Q&A session, one of our readers, Dirt Farmer Jay (as his YouTube channel is called), asked for us to take a stab at designing a Moxon vise. Here's our interpretation.

A LITTLE HISTORY. If you're unfamiliar with a Moxon vise, it's a benchtop vise designed for doing handwork, such as cutting dovetails. One of the first places this style of vise was shown was in Joseph Moxon's "The Art of Joinery" from the 17th century — hence the name.

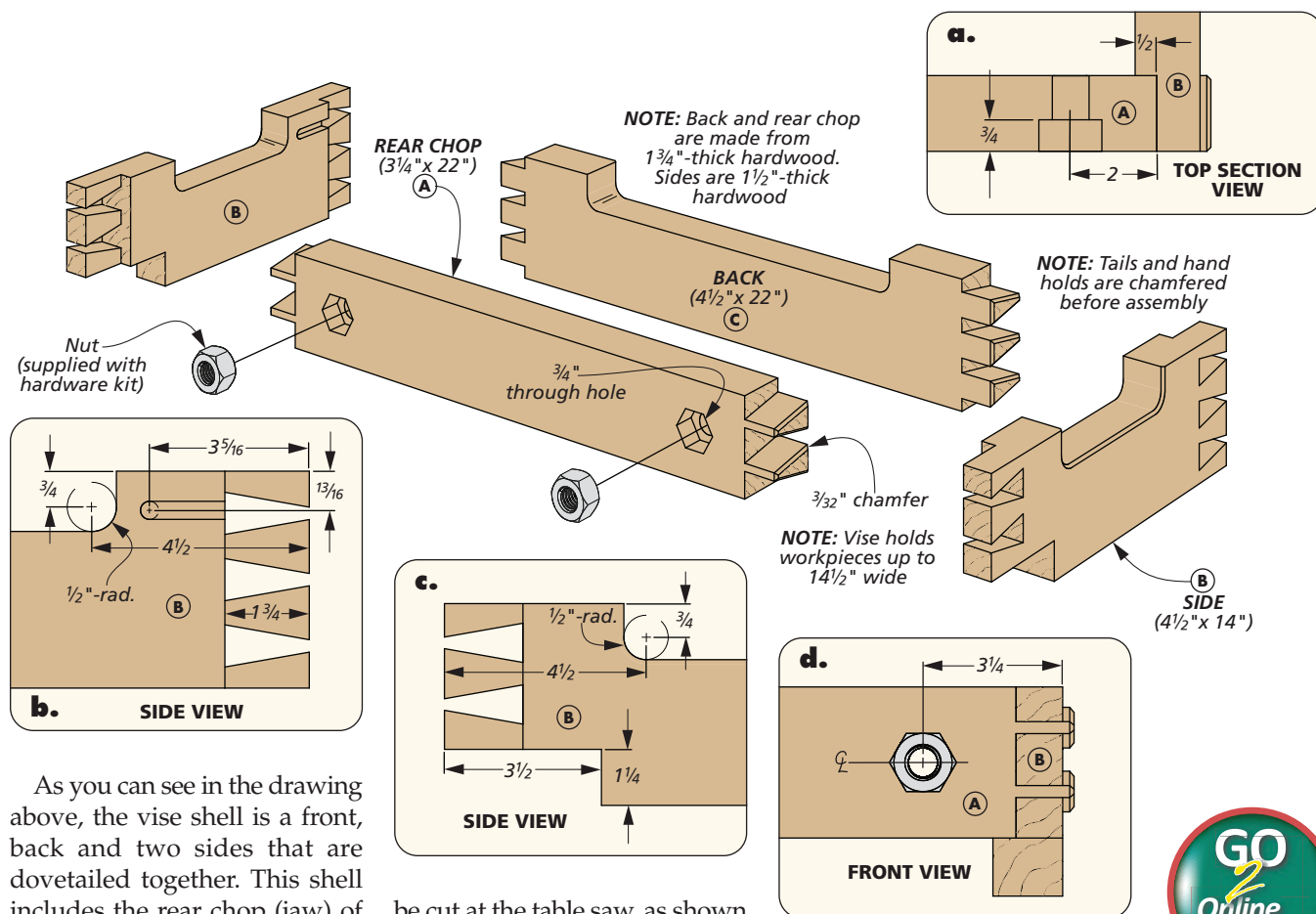
Most Moxon vises clamp to the bench with clamps or holdfasts and

ours features a small benchtop with dog holes for extra accessories. For tasks such as chopping the waste out of dovetails or for carving, you'll appreciate the extra height.

THE HARDWARE. The heart of any Moxon vise is the pair of hand wheels that move the front chop to clamp workpieces. Here, we've opted to go with the best — a Moxon vise kit from *Benchcrafted*. Yes, they're a splurge, but they're worth it in my opinion. If you're a more frugal woodworker, you could make your own using hardware from *McMaster-Carr*. Up first is creating the vise shell.



▲ A front cleat provides a clamping point to hold the vise to the bench. *Crubber* lined jaws grip workpieces firmly while working.



As you can see in the drawing above, the vise shell is a front, back and two sides that are dovetailed together. This shell includes the rear chop (jaw) of the vise and supports the top.

Before going into dovetail mode, you'll want to rout a small stopped groove at the back of each side. This will house clips to attach the top later. You can see this process in Figure 1 below.

The sides receive a rabbet for the front and the back of the shell. This adds a little rigidity, and can

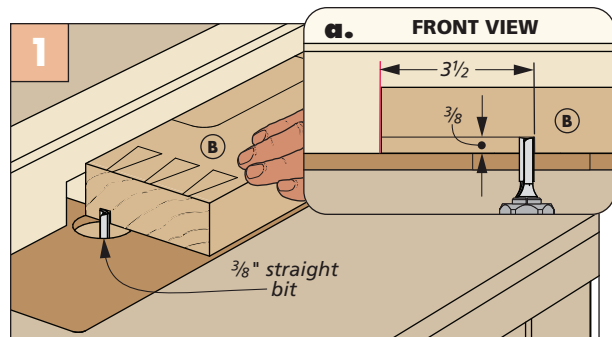
be cut at the table saw, as shown in Figure 2. While you're here, notch the lower front corner of the sides for the clamping block.

DOVETAILS YOUR WAY. I'm not going to beat around the bush — cutting dovetails in thick stock can be tricky. You can do it by hand, or opt for a band saw technique. You can find more about that online at Woodsmith.com/256.

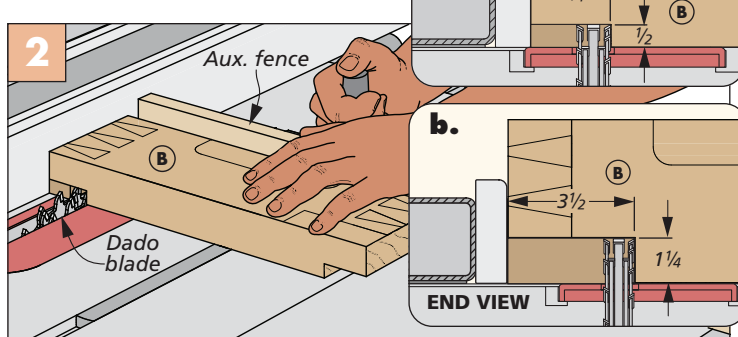
The final tasks before gluing up the shell is to recess the nuts and cut hand holds. The recesses can be drilled out with a Forstner bit, then chiseled to shape. To complete the hand holds, define the corners with a Forstner bit then saw out the waste. Now, glue the case together.



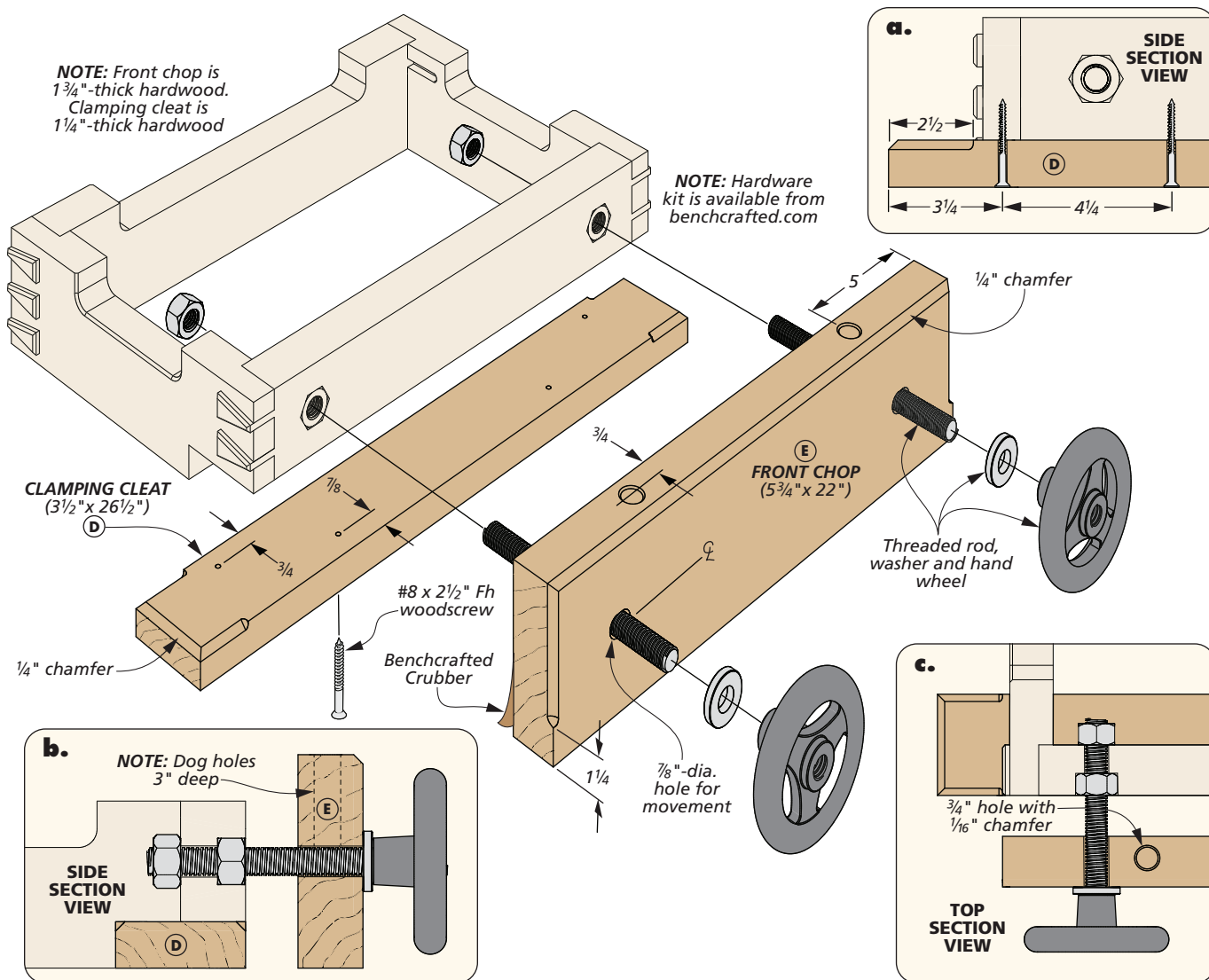
RABBETS, GROOVES & NOTCHES — OH MY



Stopped Groove. Mark the stopping point on the fence, then rout the stopped groove until the mark.



Wide Rabbet. Use a dado blade to cut the rabbet and notches in the sides. Guide the workpiece with an auxiliary fence on the miter gauge.



Wide front **CHOP**

With the shell complete, take a look at the next two components — the clamping cleat and the front chop. Both are thick pieces of hardwood for a sturdy, robust vise.

CLEAT FIRST. Create the clamping cleat by sizing it appropriately, then put it in place in the notch under the shell. After centering it, mark the location on the cleat and head over to the router table. Here, you'll rout a decorative chamfer around the front, back, and ends of the cleat. It will take a little bit of careful routing, but make sure the chamfer starts and stops right at the marks you

made. That way the chamfer doesn't sneak under the side of the shell.

Clamp the cleat in place on the shell and predrill a few holes. You'll drill two into the rear chop and one into each of the sides (detail 'a' above). Drive the screws home to lock it in place.

FRONT CHOP. Like the clamping cleat, the front chop is a hefty piece of hardwood. Use the same router table setup to rout a stopped chamfer around the front edge of this part as well. Then, at the drill press, drill a pair of holes in the top for some dogs. Keep the chop tight

against the fence — you don't want crooked dog holes if you can help it. While still at the drill press, drill the two through holes for the threaded rod. Note that these should be slightly oversize or oblong for ease of chop movement.

Installing the front chop is a two part process. First, thread the rod through the nuts that are recessed in the rear chop. As they emerge through the inside of the shell, add an additional nut to each to lock the rod in place. You can fine-tune the amount of rod protruding through the front chop by threading the rod

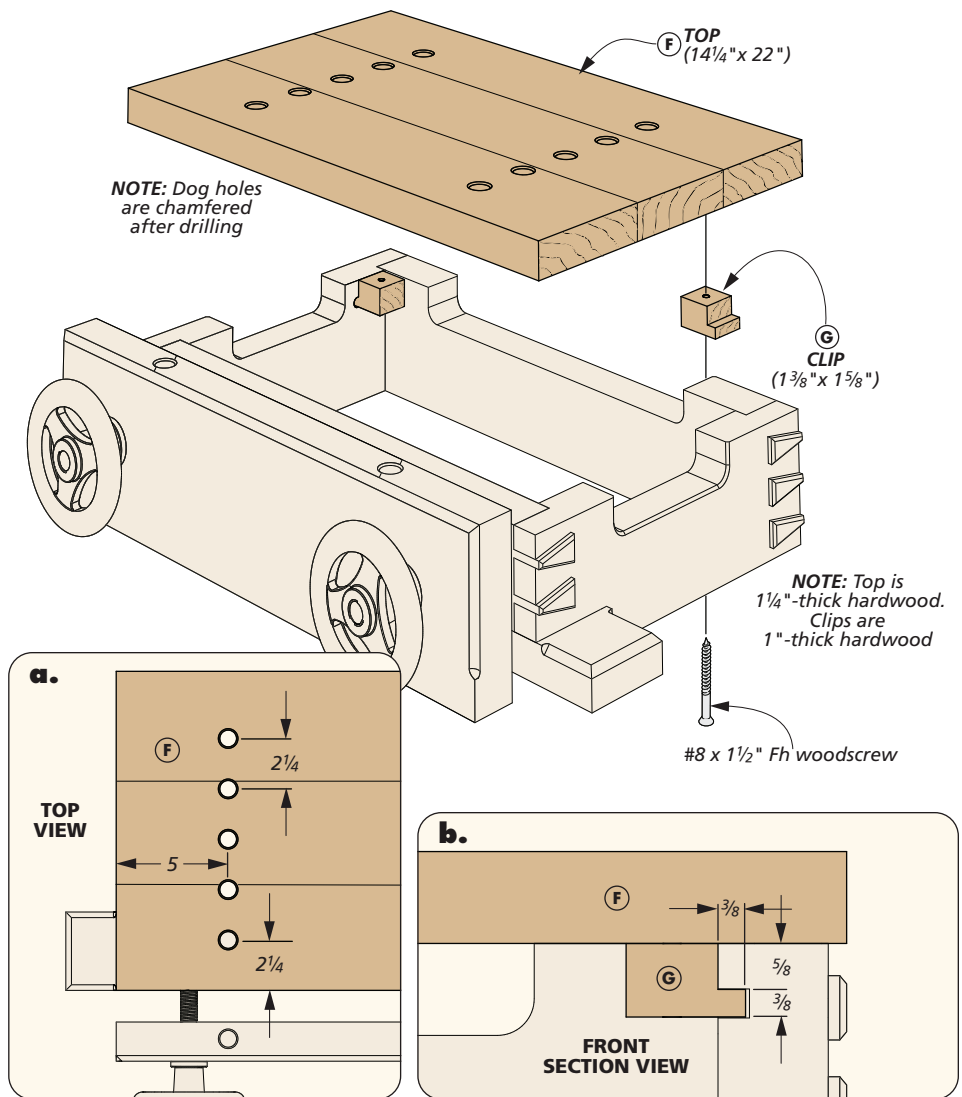
further into the shell. Now, slip the front chop over the threaded rod and install the washers and large hand wheels.

MINI TOP

The worksurface of the vise is a mini workbench. Edge glue enough stock to make up the needed width and cut it to size. Drill a series of dog holes for accessories. You can put these wherever, but our placement can be seen in detail 'a'. You'll probably want a few holes to line up with the chop holes.

WOOD CLIPS. To attach the top, the front edge is glued in place along the top of the rear chop. To allow the back edge to expand and contract, use a pair of wood clips in the stopped grooves. These can be made by rabbeting the ends of extra-long stock and cutting them to length. After they're made, install the rear clips with screws.

All that's left to do is line the jaws (if you'd like) and apply a finish. For a shop fixture like this, a coat of tung oil and some paste wax seems to just get better with age. **W**



Materials, Supplies & Cutting Diagram

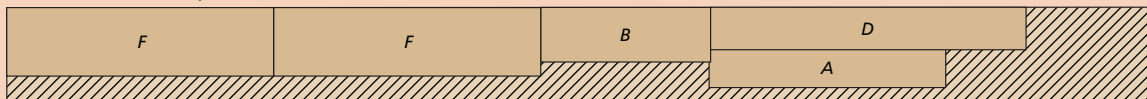
A	Rear Chop (1)	1 3/4 x 3 1/4 - 22
B	Sides (2)	1 1/2 x 4 1/2 - 14
C	Back (1)	1 3/4 x 4 1/2 - 22
D	Clamping Cleat (1)	1 1/4 x 3 1/2 - 26 1/2
E	Front Chop (1)	1 3/4 x 5 3/4 - 22

F	Top (1)	1 1/4 x 14 1/4 - 22
G	Clips (2)	1 x 1 3/8 - 15/8
• (4) #8 x 2 1/2" Fh Woodscrews • (2) #8 x 1 1/2" Fh Woodscrews • (1) Benchcrafted Moxon Vise Hardware Kit		

1 3/4" x 8" - 84" Hard Maple (9.3 Bd. Ft.)



1 3/4" x 8" - 96" Hard Maple (10.6 Bd. Ft.)



Creating Custom Veneered Doors

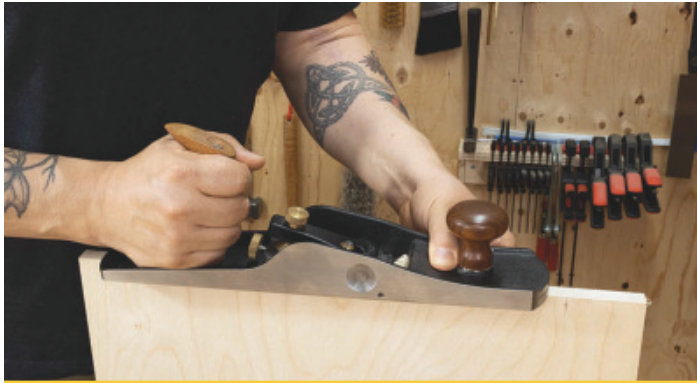


► Vic Tesolin advocates for a skills heavy approach to woodworking in his new book, from which this article is adapted.

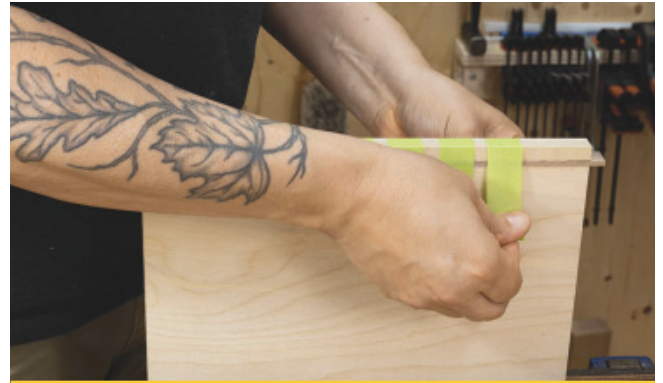


The design of the cabinet shown above is modern, with clean lines and simple joinery. The sides are connected to the top and bottom using a series of dowels and the permanent shelf sits in a dado. The doors are veneered plywood panels. Veneering has gotten a bad reputation because it is often associated with cheap, disposable furniture.

However, done correctly, veneered elements in a piece of furniture can be just as durable as solid-wood components. There are veneered antiques well over 100 years old that are still in great shape! Many woodworkers shy away from working with veneers, but as you're about to see, using them is quite simple and they can add striking elements to your work.



▲ Clean up any blade and burn marks with a hand plane. A sharp blade and light cuts allows you to achieve smooth edges and keep the edges square to the faces for a strong glue bond.



▲ Masking tape makes an effective and inexpensive clamp to secure hardwood edging to the plywood core panel. Pull the tape taut as you secure it to the plywood.

USE A PLYWOOD CORE. Consult the cut list and cut the door panel out of the Baltic birch plywood. You need to be sure that the grain is running in the correct direction on the plywood. This is essential in order to prevent the door from warping. The plies of plywood run 90° to each other alternately, so you have to keep that pattern going.

The plywood grain will run across the width of the door and the veneer grain will run vertically. Saw close to your layout lines then true up your cuts with a jack plane. The door will have

banding attached to the outside perimeter of the plywood. This will conceal the plies and will make the door edges more durable. Mill up some material according to the cut list and plane it to final dimension. Use a quick thicknessing jig. I made a simple jig to help get consistent thicknesses as I worked. At this point, you can keep the bandings a little oversized so you can trim them later

CAULS ARE EXTRA HANDS. Make a set of clamping cauls out of Baltic birch plywood to help spread the pressure. Clamping pressure radiates out at an angle around 45° so increasing the distance between the clamp and the glue line will help. In this case, I recommend using tape as a clamp.

The tape I'm using here is a 3M product called 233+ and sometimes gets sold as binding tape. Many luthiers use this product because it has great tack but doesn't leave residue behind. There is also quite a bit of stretch to this tape, so you can pull it and attach it in place which will apply clamping pressure.

BAND THE EDGES. Start by banding the top and bottom of the door, then let the glue set up for a couple of hours. After the glue has set, remove the tape and use a finely set plane to level the banding with the plywood.



◀ Trim the edging with a hand saw, then use a block plane and sanding block to ensure the edges and faces are crisp and flush.

Use a flush-cutting saw to trim the excess length flush with the plywood.

Now do the vertical edges of the door using the same techniques. Once this is done, the door is ready for veneer.

CHOOSE YOUR VENEER

The fun part about using veneer is that you can find some unique and interesting pieces that you normally wouldn't find in solid wood. The veneer I'm using is birdseye maple with an interesting brown staining in it. If this is your first time veneering, then I highly recommend using a veneer that is wide enough to cover the whole door.

CUT IT TO SIZE. Place the door onto the veneer and cut out what you need using the door as a pattern. There are many ways to cut veneers, but I find the easiest way to do it is with an *Olfa*-style utility knife.



▲ Make multiple light passes with the utility knife so that you stay on track as you cut the veneer.

VACUUM PRESS VENEERING

I use a vacuum bag system called a *Thin-Air Press*, made by a company in Toronto, Canada, called *Roarokit*. The kit is simple and inexpensive, and does a great job at veneering many furniture and small box-sized projects.

The kit consists of a sealable bag, a hand pump, and some mesh netting. I've used this press for many years and have come to depend on it as a reliable press.

VENEER CAULS. You will need to make two cauls to aid with the pressing. The top caul is a piece of $\frac{1}{8}$ " tempered hardboard and the bottom is a piece of plywood. The hardboard caul should be covered on one side with packing tape to prevent the glue from sticking (Step 1). The bottom caul doesn't need tape because you will only be applying glue and veneer on one side at a time.

PLANE & FILE. Round the edges of the cauls so that they aren't so sharp that they can dig into your veneer bag, as in Step 2.

STACK IT UP. Essentially you will be making a sandwich that is arranged from bottom to top: plywood caul, door, veneer, and hardboard caul.

First things first, tidy up your workbench of any extra tools shavings, and other detritus. You have to work efficiently when veneering so don't work

in a messy space where things can get knocked off your bench or tripped over.

Place a veneer onto one surface of the plywood, lining it up so it is positioned squarely on the substrate. Use blue tape to tape one edge of the veneer down. This tape will also act as a hinge, allowing you to move the veneer like turning a page in a book.

Turn the veneer so that you can see the plywood substrate and apply glue. Go lightly on the glue because you can easily use too much.

KEEP THE GLUE COMING. Spread out the glue into a uniform thin layer using a brayer, as in Step 3. A brayer is a printing roller used for spreading ink, but it does an excellent job with glue as well. Add more glue to any dry areas and continue to roll it out. Once you have a uniform, thin layer, lay the veneer onto the plywood, as shown in Step 4.

TAPE IT UP. Add a few pieces of blue tape around the perimeter to hold everything in place before it goes into the bag (Step 5). Place the plywood with veneer onto the bottom caul then add the top caul and secure with more tape to hold the sandwich layers all together.

APPLY THE NETTING. Then, wrap the breather net around the whole thing to ensure that all the air will be evacuated from the bag.

This is shown in Step 6.

BAG IT UP. Place the whole thing into the vacuum bag and seal the bag well with the included butyl rubber tape.

Now you simply have to pump out the air with the included hand pump until you hear the pump make a clicking noise. This should only take a minute or so, as in Step 7.

Occasionally try to pump out more air for the first 15 minutes or so to make sure you have a good seal. Double-check the butyl rubber, especially at the edges, to make sure all is good.

LET THE GLUE SET UP. Keep the door in the press for at least two hours, then repeat the same process on the other side. If you time things right, you can press the first side, press the second side, then leave it in the bag overnight.

After you remove the door from the bag for the final time, leave it rest for 24 hours. This allows the glue to finish curing.

Once the glue is cured, use a file to remove any extra veneer from around the edges (Step 8). Gently round over the edges with the file, as well. The water in the glue can cause the veneers to grow slightly. This is normal and nothing to worry about.

THE END RESULT. What you're left with is a nice cabinet door that will make your project look beautiful. **W**



▲ Tempered hardboard makes an ideal smooth upper caul. Apply a layer of clear packing tape to one face. This prevents any glue that bleeds through the veneer from sticking.



▲ A few swipes with a block plane eases the edges (and corners) of the two cauls. This slight rounding eliminates sharp edges that can damage the vacuum bag.

3



▲ An ink brayer or a small roller allows you to apply a consistent layer of glue to the plywood substrate of the door. You want an even coat that avoids puddles of glue or dry spots.

4



▲ A few strips of blue painters tape applied around all four sides tacks the veneer to the plywood panel in order to keep it from shifting in the vacuum bag.

5



▲ Build up your veneer sandwich with the bottom plywood caul, the veneered panel and topped with the hardboard caul. More tape keeps the pieces aligned and easier to handle.

6



▲ The veneer kit includes breather net to wrap around the sandwich. The net allows the pump to remove air from the bag without leaving bubbles.

7



▲ Remove air from the bag with the hand pump. The bag should suck down tight to the pieces inside. Check the status after a few minutes to spot (and fix) any air leaks.

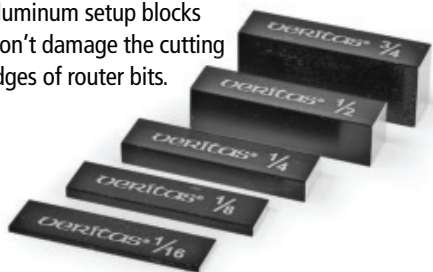
8



▲ A file is the ideal tool to clean up any overhanging veneer without causing tearout. Tilt the file to chamfer or round the veneer for a clean look that prevents chipping.

Stop Measuring at the Router Table

- Aluminum setup blocks won't damage the cutting edges of router bits.



- ▲ Placing an overhanging ruler (or another setup block) on top of the reference block provides a firm registration point for a router bit.

Precision, accuracy, repeatability, consistency — these are the hallmarks (and let's be honest, buzzwords) that surround the router table. I rely

on my router table for all these traits. But too often they lose meaning or imply a false sense of success. Instead, I'd like to share how I often get my router table set up for the cuts I need. So put away your dial calipers and rulers (mostly).

GAUGE, NOT MEASURE. The stumbling block that catches most woodworkers setting up a router table is trying to eyeball a hashmark on a ruler with the round edge of a router bit. Even with young eyes, the process is sketchy at best.

A more reliable approach is to register the bit against another object. This engages more of your senses than just your eyesight. Your fingers sense minor variations between surfaces that your eyes alone can't detect.

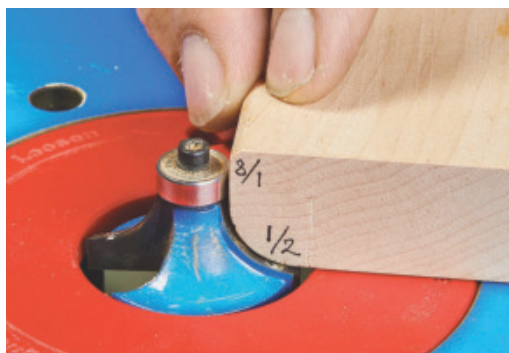


- ▲ A setup block can reference off the curved cutting edges of router bits to position the fence with confidence.

And you can even hear the soft sound of a router bit or fence coming into contact with your reference surface.

USE THE WORKPIECE. The easiest way to transition away from measuring is to use an existing workpiece. You can reference off a joinery detail or even the size of the piece to position a bit or the fence.

SETUP BLOCKS. There are plenty of times you need to position a router bit or fence and an existing workpiece can't help. That's where setup blocks come in. These are a carryover from metalworking. The blocks are made in graduated sizes, as shown in



▲ A wood gauge block lets you position a roundover bit to shape a smooth profile without leaving a stepped edge.



▲ Chamfers and roundovers are two examples of easy shop-made blocks you can put to work at the router table.

the photo on the previous page.

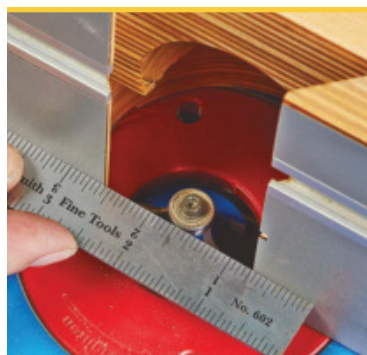
They can be used individually or stacked to provide the dimension you're looking for. Bringing the bit or fence into contact with the block confirms you have the setting dialed in (lower photos on the previous page).

SHOP-MADE BLOCKS. Metal setup blocks don't work as well with profile bits. However, you can adapt the principle and make another kind of block. You can see two basic examples in the upper right photo. I made a block for the roundover bits I have. Simply raise the bit until the cutting edges contact the block — quick and reliable.

The other block is used to set a chamfer bit to common chamfer sizes. You can see this in the main photo on the previous page. Joinery bits like drawer joint bits or cope and stick bits are other good candidates for custom setup blocks.

USES FOR A RULER. There are still uses for a ruler that don't involve measuring. In the left photo, I'm using one to align the fence with the bearing on a bit. Another use is shown below.

I don't use setup blocks and other guides just to save time. Instead, they give me confidence knowing the bit and fence position match my expectations. **W**

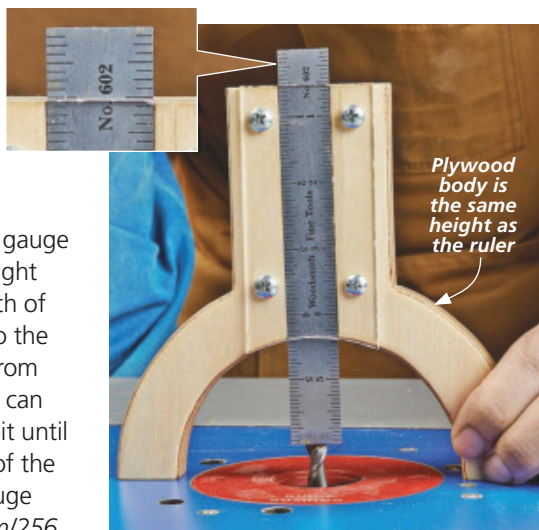


▲ A ruler works as a straightedge to align the router table fence with the front edge of a bit's bearing.

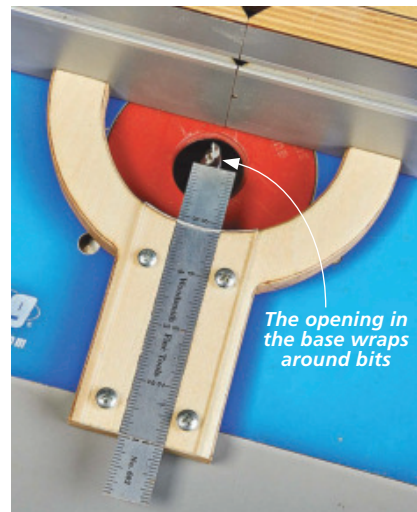
SHOP-MADE SETUP GAUGE

The beef I have with using a ruler to set up a router bit is that it's nearly impossible to align sharp, curved edges with thin marks. This setup gauge solves those issues.

A magnet in the body of the gauge holds the ruler in place. The height of the gauge matches the length of the ruler. So you can set ruler to the desired dimension when read from the top (inset photo). Then you can adjust the fence or the router bit until it makes contact with the end of the ruler. Detailed plans for this gauge are available at Woodsmith.com/256.



Plywood body is the same height as the ruler



The opening in the base wraps around bits

Most of the materials and supplies you'll need to build the projects are available at hardware stores or home centers. For specific products or hard-to-find items, take a look at the sources listed here. You'll find each part number listed by the company name. See the left margin for contact information.



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