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Full-size
Patterns



- Complete step-by-step instructions for making a Stickley hutch
- A great tilting jig for the drill press and our newest 18 wheeler
- Build an old world jewelry box using modern production shop techniques



TODAY'S

Issue 35

WOODWORKER[®]

PROJECTS, TIPS AND TECHNIQUES



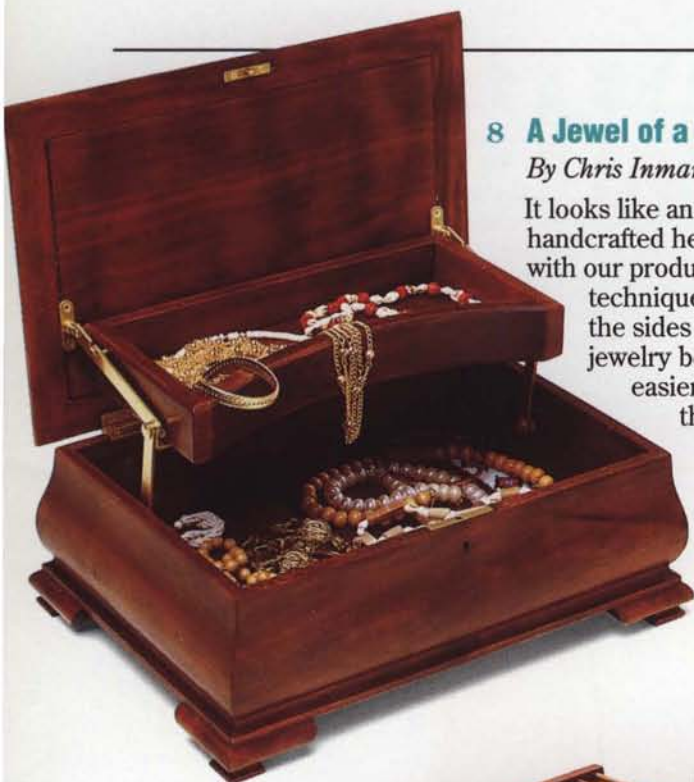
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TODAY'S

WOODWORKER®

PROJECTS, TIPS AND TECHNIQUES



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By Chris Inman

It looks like an old handcrafted heirloom, but with our production shop techniques for shaping the sides and feet, this jewelry box is far easier to make than you might expect.



13 The Stickley All-Purpose Hutch

By Rick White

Tip your hat to Gustav Stickley and get ready for a real joinery workout; there're plenty of half laps and mortise and tenons in this project, and a few dovetails for good measure.



20 Toddler's Tanker

By David Larson

Number two in our "over-the-rug" series, this little tanker will really rev up some lucky child's imagination. Follow our full size patterns to keep your shop buzzing for a weekend.

3 On the Level

American Baby magazine builds a very "fishy" rocking toy.

4 Tricks of the Trade

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5 Hardware Hints

At last—a jewelry box tray lift.

6 Jigs and Fixtures

This tilting jig for drilling angled holes is an essential addition to any shop.

23 Today's Wood

Yew, the ancient tree of life, is making headlines in the 90s as part of the battle against cancer.

Safety First

Learning how to properly operate power and hand tools is essential for developing safe woodworking practices. For purposes of clarity, necessary safety guards have been removed from the equipment shown in some of the photos and illustrations in Today's Woodworker. We in no way recommend using this equipment without safety guards and urge readers to strictly follow manufacturer's instructions and safety precautions.

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Today's Woodworker, (ISSN: 1041-8113) is published bimonthly (January, March, May, July, September, November) by Rockler Press, 21801 Industrial Blvd., Rogers, MN 55374-0044. Second class postage paid at Rogers, MN and additional mailing offices.

POSTMASTER: Send address changes to Today's Woodworker, PO Box 420235, Palm Coast, FL 32142-0235.

One year subscription price, \$19.95 (U.S. and possessions); \$23.95 (Canada/foreign). Single copy price, \$4.95 (U.S. and possessions); \$5.95 (Canada/foreign). Send new subscriptions to Today's Woodworker, PO Box 420235, Palm Coast, FL 32142-0235. Submit project proposals, tips and techniques to the editor, Today's Woodworker, Box 44, Rogers, MN 55374.

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ON THE LEVEL

A School of Holy Mackerels

Our thanks go out to American Baby magazine. In the May issue of that publication one of their editors built *Holy Mackerel*, the rocking fish from our September 1993 issue. Can you believe it ...we've received almost 500 orders for issue 29 as a result of that article and requests are still trickling in! That little rocking fish, designed by contributing editor Richard Starr, continues to be popular with our own readers as well (see photo below).

The TW staff is busy nailing down our project schedule for the next year, based largely on the requests many of you have passed along to us. Another entertainment center is on board for November and in 1995 look for an old style telephone, a gun cabinet, a steamer chair, a dining room side-board and, of course, a host of jigs and fixtures and easy to make weekend projects.

Larry N. Storken



Readers Nick Morgan (above) and Donald Edwards (right) recently completed work on their southwestern desks from issue 27.



Regarding a little advertising on the inside and back covers of your magazine...I know the temptation must be terrific. In fact, I'm surprised that you held out this long. A few added pages is a fine idea. But please, don't let advertising spoil the look of what I have always called the cleanest, most attractive magazine on the market.

Dick Dorn
Oelwein, Iowa

I have to say I was tickled to see the picture of my workbench in issue 33. A lot of people at work (who have never seen your magazine) saw that issue! Here's a picture of the completed southwestern desk I was working on at the time. Thanks for the great idea and plan. My next project is the computer desk featured in issue 32. Interesting that this will be my third Rick White project in a row. I guess up there in hockeyland they call that a hat trick.

H. Nick Morgan
McLean, Virginia

My daughter has a solar room of southwestern decor, so your southwestern desk was a natural for me to build for her. I changed the dimensions and mortise and tenon design slightly (mine do not go all the way through the legs). I went with double tenons using my Porter-Cable tenon jig, which sped up the work considerably. I used no wood filler on the red oak, but applied six coats of McClosky varnish rubbed to a matte finish. Please continue to give us projects of this type; we appreciate them.

Donald Edwards
Westport, Massachusetts

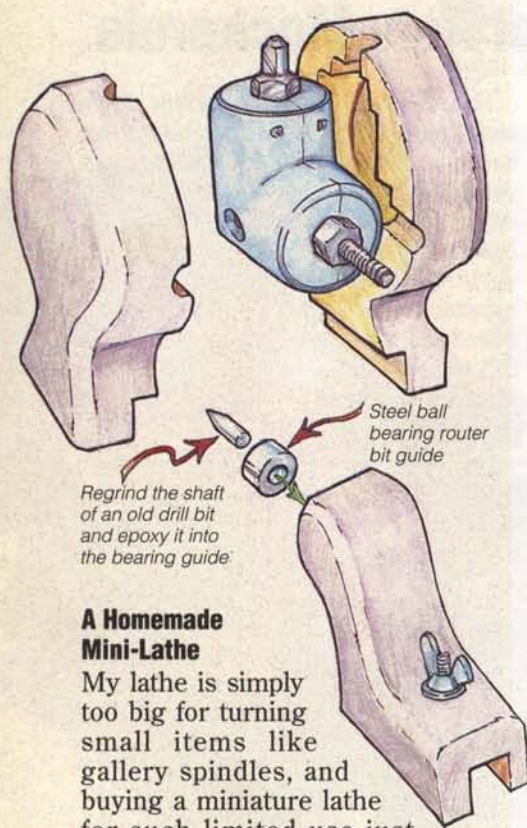
I've just received the latest issue of Today's Woodworker and found it to be on par with all previous issues, that is to say excellent! Sir, I implore you and the staff to look carefully at the idea of advertising. All I ask is to go carefully and remember your first love. I don't mind ads, but moderation in all things except wood sounds like sage advice.

Bill Rand
Modesto, California

I love Today's Woodworker and have used a lot of ideas from it. I made Lone-some Dovetail in 1992 and then completed Holy Mackerel in 1993. Now both of my granddaughters have a rocker to ride.

Don Place
Columbus, Ohio





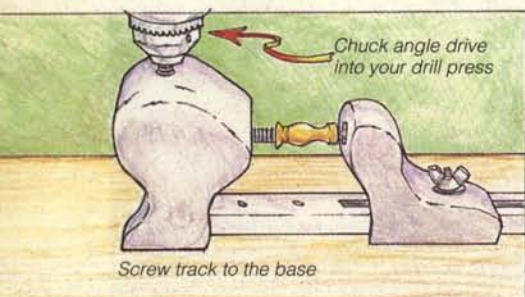
Reground the shaft of an old drill bit and epoxy it into the bearing guide.

A Homemade Mini-Lathe

My lathe is simply too big for turning small items like gallery spindles, and buying a miniature lathe for such limited use just wasn't economical. Instead, I turned to my drill press for an answer and came up with this drill press powered mini-lathe.

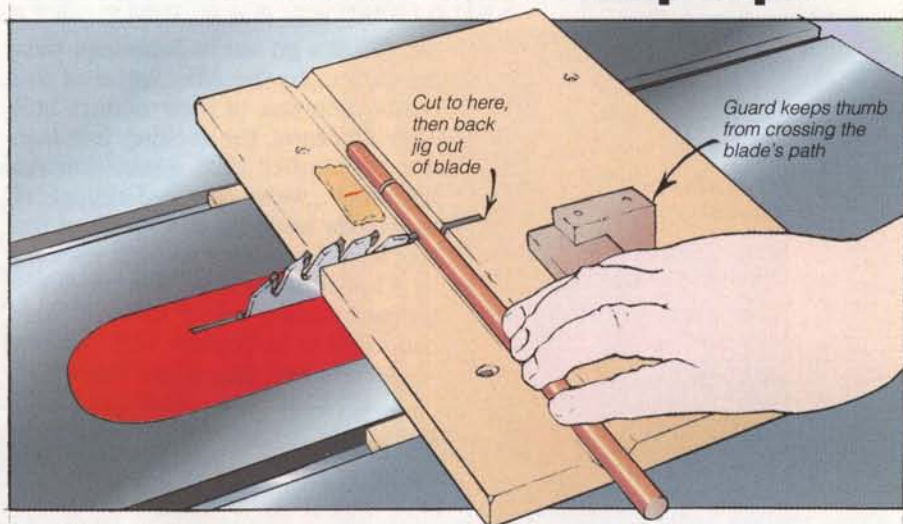
I purchased an inexpensive right angle adapter for a drill and encased it in a wooden shell for my mini-lathe's headstock. The headstock was then screwed to a track and mounted to a base along with a track and an adjustable tailstock. The tailstock features a pointed center that rotates freely within a steel ball bearing guide embedded in the wood. I also made an optional duplicator for my new jig and ground several old files into small lathe tools.

*Dick Dorn
Oelwein, Iowa*



Screw track to the base

A Harvest of Shop Tips



Dowel Cut Off Jig

Cutting small diameter dowels can be a tricky business, so we devised a table saw jig that eliminates the tendency for the dowel to jump as it passes through the blade. Cut a V-groove in a plywood platform and screw two guides to the plywood that fit in your table saw's miter gauge slots. Run a strip of masking tape along the groove and mark the length of dowel you want—replace the tape when it gets too full of pencil lines. Screwing small wood blocks to the platform provides a good hand hold and guard for pushing the jig into the blade, but be sure to stop pushing once the blade passes through the V-groove.

*Alice & Robert Tupper
Canton, South Dakota*

As Smooth as Glass

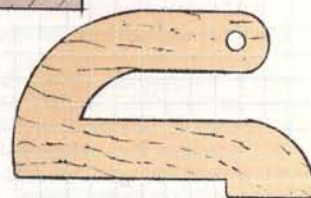
I couldn't believe my fingers. After applying a coat of polycrylic finish, I tried rubbing a project with a balled up piece of brown paper grocery bag instead of sandpaper. I avoided using the printed parts of the bag and didn't use any oil or mineral spirits as a lubricant. The result was a surface as smooth as glass.

*Henry C. Jones
Bonnie, Illinois*



Make push tool from veneer core plywood

Each grid square equals 3/4 inch



Still More on Push Sticks

Since I began woodworking in 1947 I've seen many accidents occur when a table saw operator used a standard push stick. In response to these avoidable mishaps, I've designed a very safe push tool that provides full control of a workpiece, and it won't roll, fold, turn or get pulled into the blade like other pushsticks.

*Albert G. Smith
Brandon, Florida*

Recycling Pallet Lumber

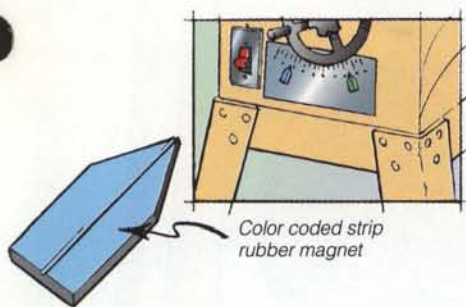
If you've ever tried removing those wonderful hardwood boards from pallets, you know it's not an easy job. I've discovered a method that leaves the wood free of the usual gouges that result from pulling the nails. First, I center punch all the nail heads, then, using a sharp drill bit that's about the same diameter as the shank of the nails, I drill into each nail until the head pops off. With a few taps of a hammer the boards slip right off the nails, ready for planing.

*Ray Elwart
Romulus, Michigan*

Wood Conservation

Instead of throwing short or narrow cutoffs in the burn barrel, I glue them together to make blanks for drawer sides and backs. Working with anything longer than 3", I first square the ends and glue them end to end into 19" to 25" lengths. I don't pay much attention to thickness at this point. After the glue dries, I joint both edges of each strip and glue them edge to edge to make 5" wide panels. Next, I flatten one face with my belt sander and a 40 grit belt, then run the sanded surface over the jointer. With one surface flat, I can send the panel through my planer to machine it to 1/2" in thickness. Making these scrapwood panels for several months has supplied me with a surprising amount of material for my next drawer project.

*Doug Young
Clearville, Pennsylvania*



Bevel Setting Indicator

You can ensure consistent bevel settings on your table saw by marking the blade angle scale with a piece of strip rubber magnet. Cut the magnet to a sharp point and position it directly across from the scale indicator once the blade angle is set. A dab of paint on the point will make seeing the magnet easier, and using several magnets painted with different colors will save time on projects that require multiple angle settings.

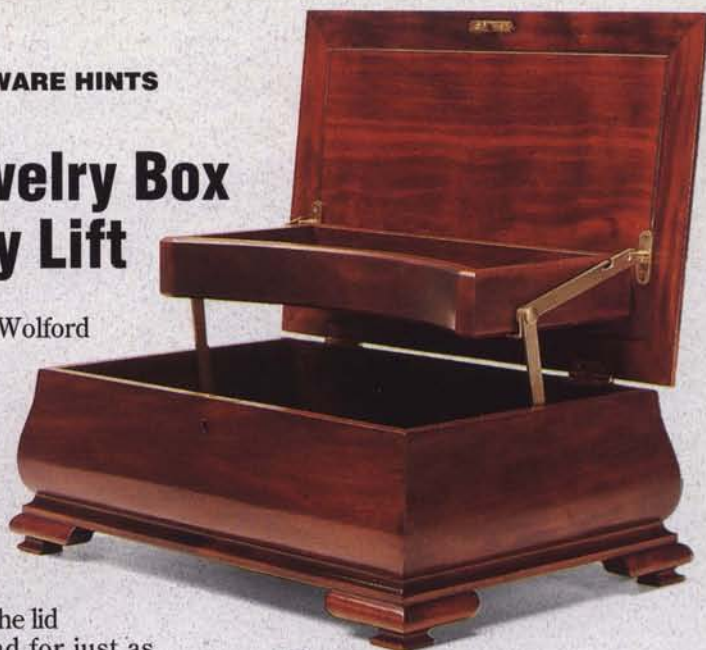
*Claude Belleau
Troy, Michigan*

Today's Woodworker pays from \$35.00 (for a short tip) to \$150.00 (for each issue's "Pick of the Tricks") for all Tricks of the Trade published. Send yours to Today's Woodworker, Dept. T/T, Rogers, MN 55374-0044.

HARDWARE HINTS

Jewelry Box Tray Lift

By Al Wolford

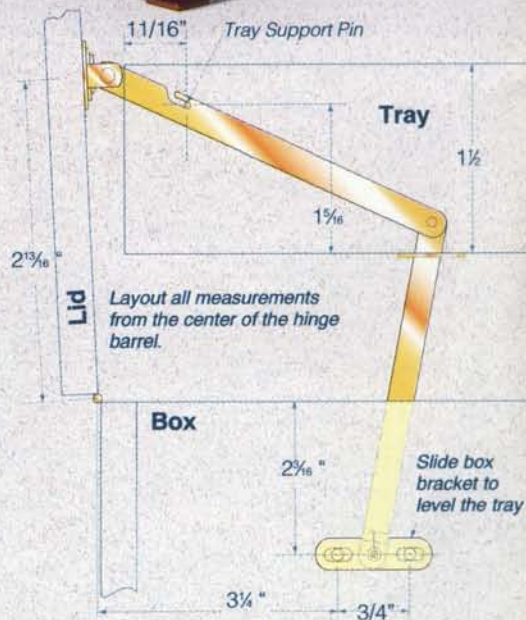


For years I've been recommending a support for use in blanket chests that lifts a tray as the lid swings open. And for just as long I've also been asked about similar hardware for use in small boxes. Unfortunately, there just wasn't any that I thought would do. Until now that is.

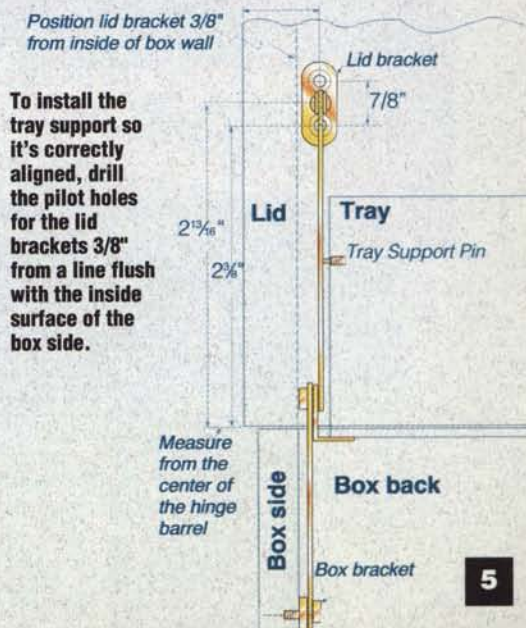
The development gurus at The Woodworkers' Store have come up with the perfect support for jewelry box lids. This solid brass, scaled down version of the blanket chest hardware is designed to cradle a removable tray for displaying your favorite momentos. As you open the lid, the tray rises out of the way so you can reach into the lower section more easily.

As with the blanket chest hardware, precision is the key to installing the jewelry box tray lift support. Measure all the mounting locations from the center of the hinge barrels so that the swing of the lid works in unison with the bend in the supports. To make the installation a little easier, two of the support joints come apart, and the elongated screw holes in the box bracket allows 1/8" of movement for fine tuning. In addition to the hardware requirements, make sure your tray fits between the supports with a minimal amount of play. As always, it's best to have the hardware on hand before building your project.

Al is the technical service manager at The Woodworkers' Store. Send your hardware questions or comments to Al c/o Today's Woodworker, Dept. HH, Rogers, MN 55374-0044.



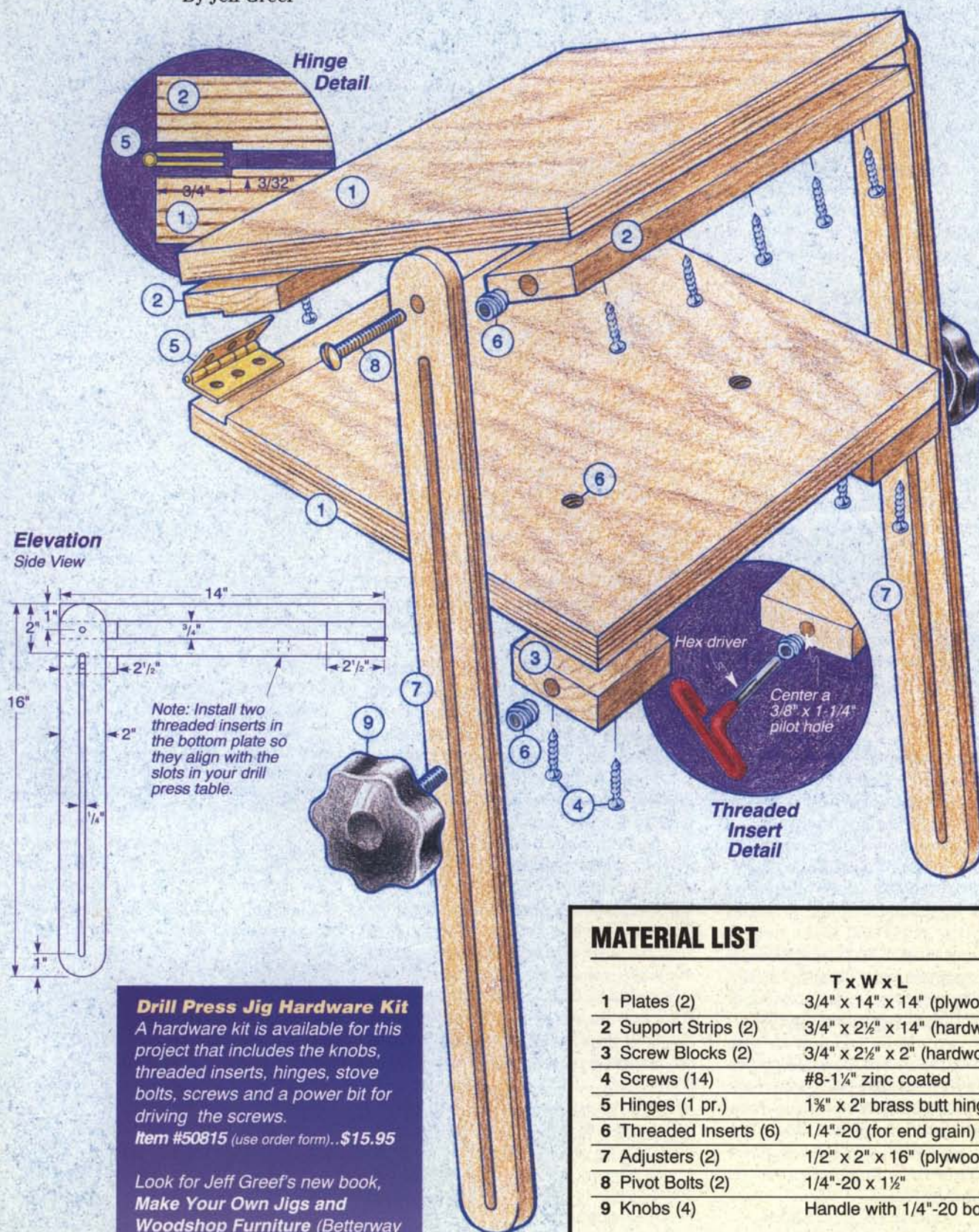
When installing both the lid and box brackets, first drill a shallow hole for the center posts, then drill pilot holes for the screws.



To install the tray support so it's correctly aligned, drill the pilot holes for the lid brackets 3/8" from a line flush with the inside surface of the box side.

Tilt Table for the Drill Press

By Jeff Greef



MATERIAL LIST

	T x W x L
1 Plates (2)	3/4" x 14" x 14" (plywood)
2 Support Strips (2)	3/4" x 2 1/2" x 14" (hardwood)
3 Screw Blocks (2)	3/4" x 2 1/2" x 2" (hardwood)
4 Screws (14)	#8-1 1/4" zinc coated
5 Hinges (1 pr.)	1 3/8" x 2" brass butt hinge
6 Threaded Inserts (6)	1/4"-20 (for end grain)
7 Adjusters (2)	1/2" x 2" x 16" (plywood)
8 Pivot Bolts (2)	1/4"-20 x 1 1/2"
9 Knobs (4)	Handle with 1/4"-20 bolt

Drill Press Jig Hardware Kit

A hardware kit is available for this project that includes the knobs, threaded inserts, hinges, stove bolts, screws and a power bit for driving the screws.

Item #50815 (use order form)...\$15.95

Look for Jeff Greef's new book, *Make Your Own Jigs and Woodshop Furniture* (Betterway Books, 513-531-2222).

Ever tried drilling angled holes with a standard drill press? Setting up can be a real pain. But with this homemade tilting jig your results will improve immediately. Clamp it right to your drill press table and add fences or stops to get accurate, repeatable borings in projects like the windsor chair seat shown here. Follow the six construction steps below and use our full size patterns to build this essential shop jig in an afternoon.



Step 1: Cut stock to size and rabbet the lower plate and one strip to accommodate the hinges (see hinge detail). Secure the hardwood to the plates with screws and install the hinges.



Step 2: Drill pilot holes for the threaded inserts in the ends of the strips and screw blocks, and in the bottom plate. Wax the inserts and install them with a hex driver.



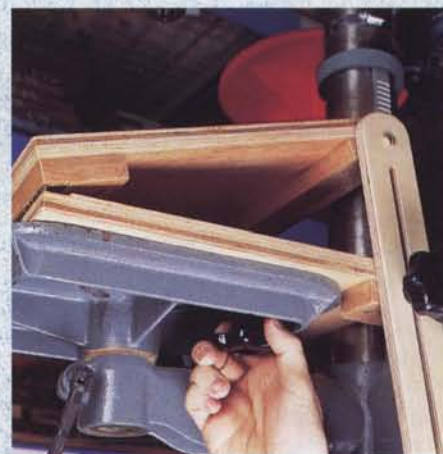
Step 3: Cut plywood for the adjusters and layout the pivot hole and slot on each one (see the full size pattern between pages 12 and 13). Drill the 1/4" pivot holes.



Step 4: Rout the slots in shallow passes with a 1/4" straight bit after marking the bit's cutting area on the fence. Use the marks as guides for starting and stopping the cuts.



Step 5: Secure your belt sander in a vise and shape the ends of the adjusters. Use a palm sander to smooth the jig's surfaces and ease all the corners. Apply a coat of sanding sealer.



Step 6: Bolt the adjusters to the upper plate assembly and clamp them to the screw blocks with knobs. Use the remaining two knobs to secure the jig to your drill press table.

A Jewel of a Box

By Chris Inman



Use an aniline dye stain and then devote a few weeks to mastering an old world finishing technique. The extra time you spend in the shop will pay off with a wonderful new family heirloom.

More than one woodworker has seen this jewelry box and thought it was a century old antique. Although what really brings a look of disbelief is learning that the sides were sculpted with a table saw blade and not with the fancy planes or moulding cutters that they expected. In fact, since the shaping involves a basic table saw set-up, this project naturally lends itself to a small production run. Shape as many feet of stock as you need for

building several jewelry boxes, or make stock to have on hand later when you need to build a gift for a special occasion.

In addition to the shaped details, credit for looking like an antique has to be shared with the outstanding finish. Red mahogany aniline dye stain gives the cherry an old world appearance, and hand rubbing the varnish topcoats with pumice and rottenstone adds great depth and clarity. You may not hear much about rubbing out a

finish today, but it was commonplace during the golden age of American furnituremaking in the 1700's — the era that inspired the design of this jewelry box project.

Start by Shaping the Sides

If you've ever made cove moulding on your table saw, you're already familiar with the method used for shaping the jewelry box front, back and side walls (pieces 1 and 2). For this project, however, after shaping the cove,

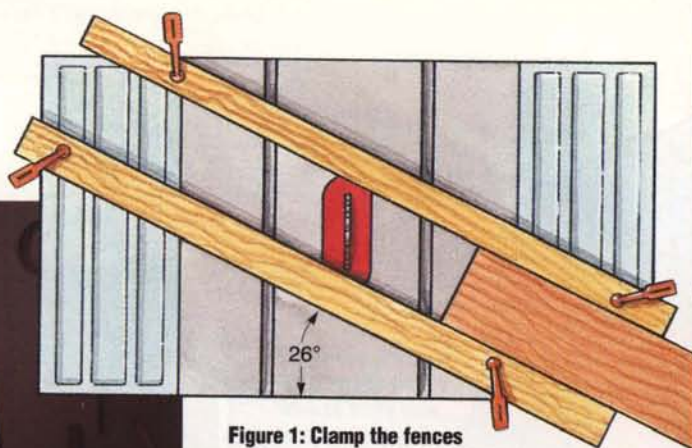


Figure 1: Clamp the fences to the saw table with the blade centered between them. To further ensure that you cut a symmetrical arch, run the stock through, then turn it end for end and make a second pass.

the moulding is ripped in half to create the wall stock. Begin by cutting a 6 1/4" x 30" piece of cherry, then clamp two auxiliary fences to your table saw as shown above in **Figure 1**. (Remember, shaping longer lengths of stock will provide material for additional boxes.) The 26° angle between the fences and the front edge of the table saw determines the shape of the arch. Setting the fences at a different angle will result in an arch that's more egg shaped or circular. You can experiment with this set-up to produce a variety of effects.

Once you've clamped the fences into position, adjust the blade so it projects about 1/16" —cuts deeper than 1/16" could bog down the saw or damage the blade. Pass the stock over the blade, then turn it end for end and make a second pass. Following this double cutting practice will guarantee that the arch is centered on the board. Continue raising the blade 1/16" at a time until it's 3/8" high, then compare your profile with the **full size pattern** shown on the insert between pages 12 and 13.

Now remove the auxiliary fences from the saw and tilt the blade 45° so you can trim the edges of the board close to the profile shown on the full size pattern. This will remove some of the waste before you complete the edge shaping with a hand plane and refine the cove with a gooseneck scraper, a random orbit sander and a palm sander (See **Figure 2**). Keep the surface as even as possible, for any dips could show as blemishes at the mitered corners of the assembled box.

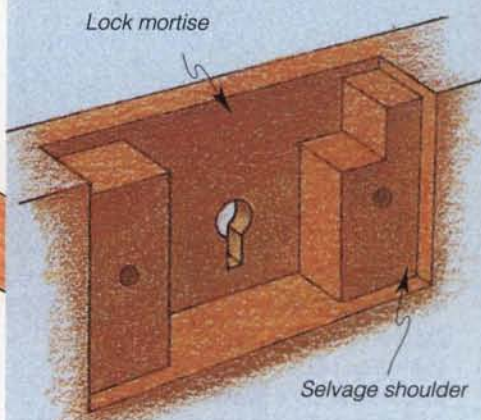
Sand the stock through the 120 grit stage, then rip it exactly in half. Next, test your saw's mitering set-up to make sure you get perfect 45° cuts that are square to the edge, then miter the front, back and side walls to length.

Reinforcing the miters with splines will greatly strengthen the structure of the box. To cut the spline grooves in the miters, first make the jig shown in **Figure 3** on page 10. Next, chuck a 1/8" straight bit in your router table, raise the bit 1/4" and rout a 1 1/2" long groove in the lower, fat part of each miter, as shown in the **back wall detail** on the next page. Be sure to alternate your approach to the bit, entering from the left for grooving the miter at one end of each piece of stock, and entering from the right for grooving the other end. Once you've finished routing the grooves, cut splines (pieces 3) to fit, making sure the grain runs across the width (otherwise they'll probably split).



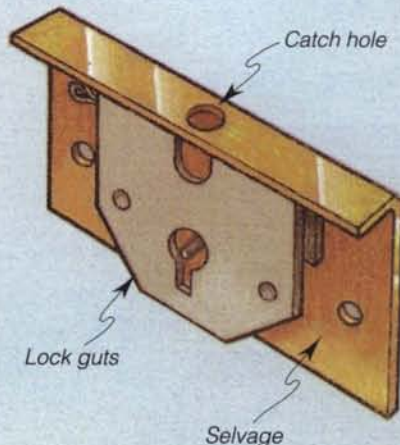
Figure 2: After shaping the walls, clean the saw marks off the stock with a gooseneck scraper, then smooth it with a random orbit or palm sander.

Fitting the Lock



Forming the mortises for the jewelry box lock is best done before assembling the walls. Layout the lock position on the front wall, making sure to include its outside perimeter as well as the inside mortise for the lock guts. Next, use a Forstner bit to drill out as much of the waste in the mortise as you can, limiting its depth to 1/4". Clean up and refine the shape of the mortise with a sharp chisel and relieve the selvage shoulder to a depth of about 3/32".

Finesse the lock into position using a chisel for any fine tuning, then drill pilot holes for the mounting screws. Layout the key-hole location inside the mortise and drill the smallest pilot hole you can at its center. Now enlarge the pilot hole with a 1/8" bit, drilling from the outside face of the wall. This method will practically eliminate any chance of tearout on the front of the wall. Wrap up the lock installation by shaping the keyhole's tail with a very slim file, chisel or coping saw blade.





Hardware Considerations

Before putting the box together take care of several preliminary hardware installation details. Begin by laying out the half mortise for the lock (piece 4) on the inside surface of the front wall, as described in **Fitting the Lock** on the previous page. Taking the time to fit your hardware properly will make a big difference in the final look of your jewelry box.

Next, layout the hinge mortises on the back wall and use a chisel to clean out the waste (see **back wall detail** above). When the hinges (pieces 5) fit just right, drill pilot holes for the screws, then layout and drill the pilot holes in the sides for the tray support pins (pieces 6), as described on page 5 in **Hardware Hints**.

Once you've laid the groundwork for the hardware spread glue on the miters and in the spline grooves, then add the splines and pull the box together with band clamps. Be sure to check the assembly for squareness by measuring the inside diagonals.

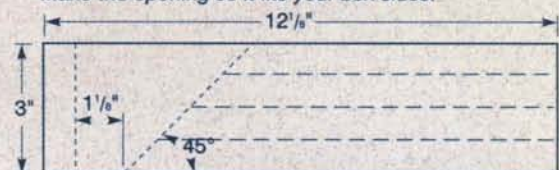
Constructing the Lid and Bottom

While the glue in the box assembly dries, begin making the lid and bottom assemblies. Once again, this a perfect opportunity for machining continuous lengths of stock if you plan on building more than one jewelry box.

Cut long strips of cherry for the frames, then form the 1/8" wide by 1/4" deep grooves for the panel joints by making a pass with your table saw blade, as shown in the **frame details** below. Miter the frame pieces to length (pieces 7 through 10), then cut stock to size for the panels (pieces 11 and 12). Form a tongue on all four edges of each panel (see frame details) with a 1/4" dado blade and check their fit in the frames. The final machining step on the panels and frame pieces is routing a very slight chamfer on the edges using a V-groove bit and your router table (see the frame details below).

Now carefully apply a coat of oil finish to the panel tongues and in the frame grooves. The oil will prevent small amounts of glue from binding the panels to the frames, which could eventually cause the panels to split. Next, spread glue on the frame miters and clamp them around the panels. Later, remove the clamps and sand the assemblies smooth, then rout the edges with a cove bit, as shown in the

Make the opening so it fits your box sides.



Stack four 3/4" x 3" x 8" pieces of plywood

Figure 3: Build the jig shown above to hold your wall stock at a 45° angle while routing the 1/4" deep spline grooves in the miters. Be sure to rout the grooves in the fat part of the stock only.



top and bottom edge details below. Be sure to avoid routing the back edge of the lid or the hinge screws will come through when you assemble the box.

After the glue dries, remove the clamps from the box and set it on the bottom assembly. If any rocking occurs, plane the bottom edges of the box by hand until you get a seamless fit, then clamp the two assemblies together and drill countersunk pilot holes for the hold down screws (pieces 13). One screw in each edge will do (see the **exploded view** at right). Now remove the clamps, spread glue on the edges and screw the bottom to the box.

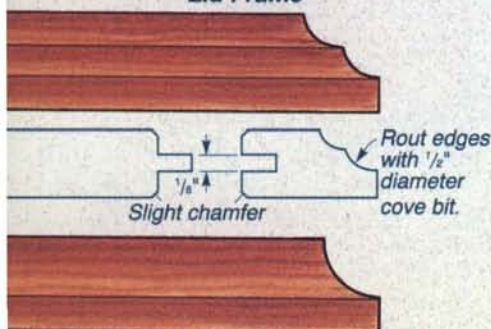
Fit the lid on the box the same way you did the bottom, and transfer the hinge mortise locations from the back wall to the lid (see the **lid elevation** at left). Clean out the mortises with a chisel, then drill pilot holes for the hinge screws and the tray support hardware (see **Hardware Hints** on page 5). You'll need to shorten six of the brass screws supplied with the hinges since they're too long for driving into the 1/2" thick lid. One good method is to grind off the screw tips with your belt sander. Install the hinges and screw the lock into the box, then layout the lock catch position on the lid and clean out the mortise with a chisel.

Adding the Feet and Making the Tray

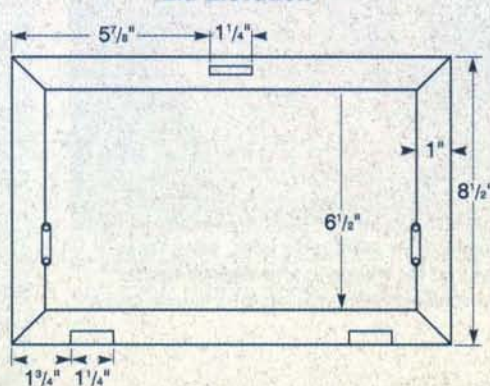
The process for shaping the feet (pieces 14) is similar to shaping the walls, except this time you'll be using a router table and a 1/4" diameter

Frame Details

Lid Frame



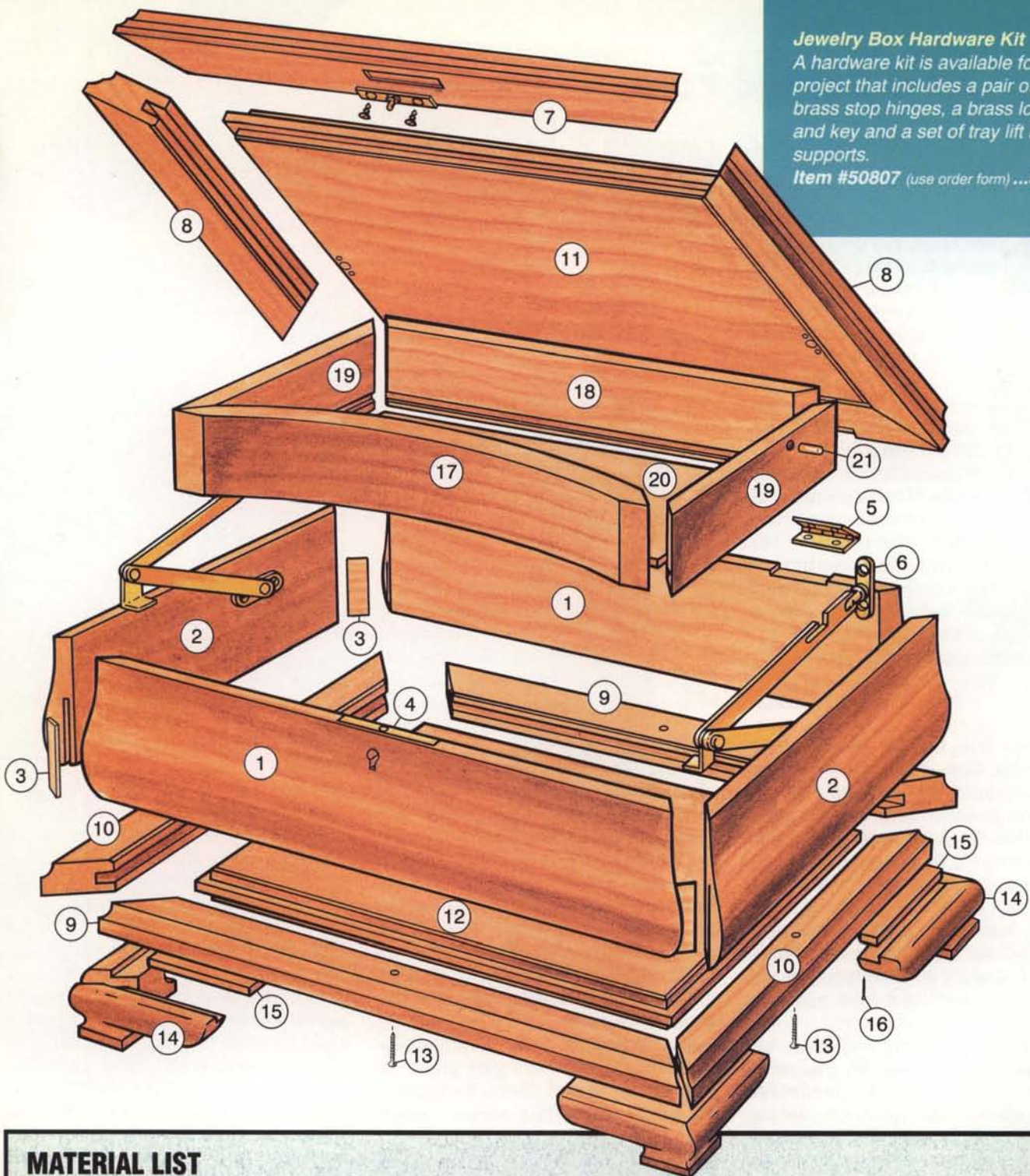
Lid Elevation



Jewelry Box Hardware Kit

A hardware kit is available for this project that includes a pair of solid brass stop hinges, a brass lock and key and a set of tray lift lid supports.

Item #50807 (use order form) ...\$49.95



MATERIAL LIST

	T x W x L		T x W x L
1 Front and Back (2)	3/4" x 3" x 13"	12 Bottom Panel (1)	1/2" x 7 1/8" x 11 1/4"
2 Sides (2)	3/4" x 3" x 9"	13 Hold Down Screws (4)	#6-1"
3 Splines (4)	1/8" x 1/2" x 1 1/2"	14 Feet (8)	3/4" x 7/8" x 2 3/4"
4 Lock (1)	1/4" x 11/16" x 1 1/4" brass	15 Gussets (4)	1/4" x 2 3/8" x 2 3/8" (plywood)
5 Hinges (1 pair)	1/2" x 1 1/4" brass	16 Brads (8)	#17 wire gauge-1/2" long
6 Tray Supports (1 pair)	Solid brass	17 Tray Front (1)	1 3/4" x 1 1/2" x 10 5/8"
7 Top Frame Sides (2)	1/2" x 1" x 12 3/4"	18 Tray Back (1)	1/2" x 1 1/2" x 10 5/8"
8 Top Frame Ends (2)	1/2" x 1" x 8 1/2"	19 Tray Sides (2)	1/2" x 1 1/2" x 5 5/8"
9 Bottom Frame Sides (2)	1/2" x 1" x 12 3/4"	20 Tray Bottom (1)	1/4" x 4 5/8" x 10 5/8" (plywood)
10 Bottom Frame Ends (2)	1/2" x 1" x 8 5/8"	21 Pins (2)	5/32" x 1/2"
11 Top Panel (1)	1/2" x 6 1/8" x 11 3/4"		

Shaping the Feet

A router table is ideal for shaping stock for the feet. By passing a long strip over different router bits and a table saw blade, you can produce a moulding profile like the one shown in the **full size pattern**—a little sanding should be all that's needed to complete the shape.

The key to making the feet is to first glue short segments of the stock into a square. Miter four 6" pieces to length and bandsaw the front profiles so you have a pair of feet on each one. Glue the pieces into a square and reinforce the corners with the gussets. After the glue dries, cut the square into four corners.



Step 1: Rip your stock and rout one edge with a 1/4" roundover bit.



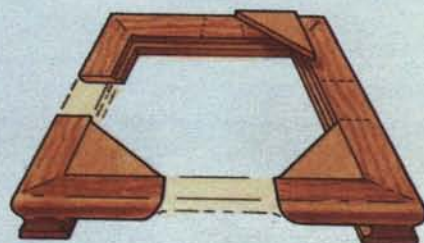
Step 2: Shape the inside curve with a 1/4" diameter core box bit.



Steps 3 & 4: Rout the 1/4" x 1/4" rabbet with a 1/4" straight bit and nip 1/8" off the toe with your table saw. Shape the inside corner of the roundover with sandpaper.



Step 5: Cut four 6" lengths of moulding and layout the front profiles for each pair of feet. Drill starter holes and bandsaw the pieces to shape, leaving a connecting bridge in the center. Miter the end of each foot.



Step 6: Glue the pieces into a square (holding them with a band clamp) and glue the gussets into the corners. Later, cut the assembly into four corner sections and complete the shaping.

core box bit. Follow the steps in **Shaping the Feet** above, then assemble them into a frame with the plywood gussets (pieces 15). After separating the feet corners, glue and nail (pieces 16) them to the box.

Curving the tray front provides extra hand room for reaching into the jewelry box. Making this piece would ordinarily call for a bent lamination technique, but since so little stress is put on the front, cutting it from a thicker piece of wood works just fine.

Rip cherry for the tray front, sides and back (pieces 17, 18 and 19), and miter the pieces to length. Next, trace the **full size pattern** of the front onto the top edge of the front stock and bandsaw it to shape. Cut grooves in the sides and back for the tray bottom by making two passes over your table saw blade, sizing the grooves for a good fit with your 1/4" plywood. To form the groove in the tray front, make two passes with a 1/8" slot cutting bit (be sure the bearing limits the depth of cut to 1/4"). Cut the bottom (piece 20) to shape, following the **full size pattern**, then spread glue on the miters and put a few drops in each bottom groove. Band clamp the tray together, then later, sand the joints smooth and drill pilot holes in each side wall for the tray hardware pins (pieces 21), as described in *Hardware Hints*.

Finishing

For an aged appearance, color the cherry jewelry box with red mahogany water soluble aniline dye stain (available from The Woodworkers' Store). Mix the stain full strength and apply it with a foam brush (See **Figure 4**). Allow the stain to soak in for several minutes, then wipe off the excess with a rag. If the dye stain darkens more than you want, wipe the project with a damp rag to remove some of the color.

After drying for a day, sand the project lightly with 400 grit paper to remove any raised fibers, then brush on a coat of sanding sealer. Follow



Figure 4: Using a sponge brush, apply the aniline dye stain liberally, and wipe off the excess after allowing it to soak in for several minutes.

with three coats of high gloss varnish, allowing at least five days drying time for each of the first two coats and about three weeks for the third coat before rubbing out the finish. Sand between coats with 400 grit silicon carbide steared sandpaper, which will not clog like standard paper.

To rub out the varnish, begin by dipping a piece of 600 grit silicon carbide paper in mineral spirits and lightly sanding the project. Be conservative, because it's easy to sand right through the finish, especially at the corners. Next, ball up some cheesecloth, rewet the surface with mineral spirits and sprinkle on a bit of pumice. Rub the box gently with the cloth in a circular motion until you get an even level of glossiness and have completely removed any bumps or runs. Repeat this process with rottenstone to get a beautiful satin finish.

Once you've rubbed out the varnish, wipe the jewelry box with a clean piece of cheesecloth and install the hinges, the lock and the lid support hardware. Sign and date the bottom of the box to remind others of this heirloom's origins, and don't be surprised if it's the only way you can convince your friends that this is not an antique. At least not yet.



Few woodworkers have had more impact on furniture design in this century than the Stickley brothers. Their work emphasized simplicity, sturdiness and exposed joinery, what Gustav Stickley liked to call the "structural style." Even though the popularity of their furniture had faded by 1920, the innovations they introduced set the tone for the next several generations of furnituremaking. These days, Stickley designs are showing up all over the place and prices for their originals have skyrocketed. For instance, I visited an antique store recently and saw a Gustav Stickley bookcase (without drawers) selling for \$5,500.00 ... "firm."

Since an original Stickley china hutch was out of my price range, I decided to try building my own. After reading up on Gustav Stickley I was delighted to discover that he liked to have his designs built by hobbyists and even wrote articles for amateur woodworkers outlining his construction and finishing techniques. Using examples from old Stickley catalogs, I combined features from several cabinets to come up with the hutch design shown at left.

One item I wasn't sure I could find was hardware that would look right for my project. Luckily, pulls are now available that look just like the originals (*see hardware kit on page 15*). They're not cheap, but I think they're important for the success of this reproduction. By the way, I did check into ordering authentic handmade copper hardware ... \$65.00 for each drawer pull. Ouch.

The Stickleys built nearly all their furniture out of quartersawn white oak, and I stuck with this tradition. The distinctive ray patterns give the project a look that just can't be equalled with plain-sawn oak. As for the glass in the china hutch, I suggest looking in your phone book to find a local supplier. For a small additional charge, they'll usually cut panes exactly to your specifications.

Arts & Crafts Hutch

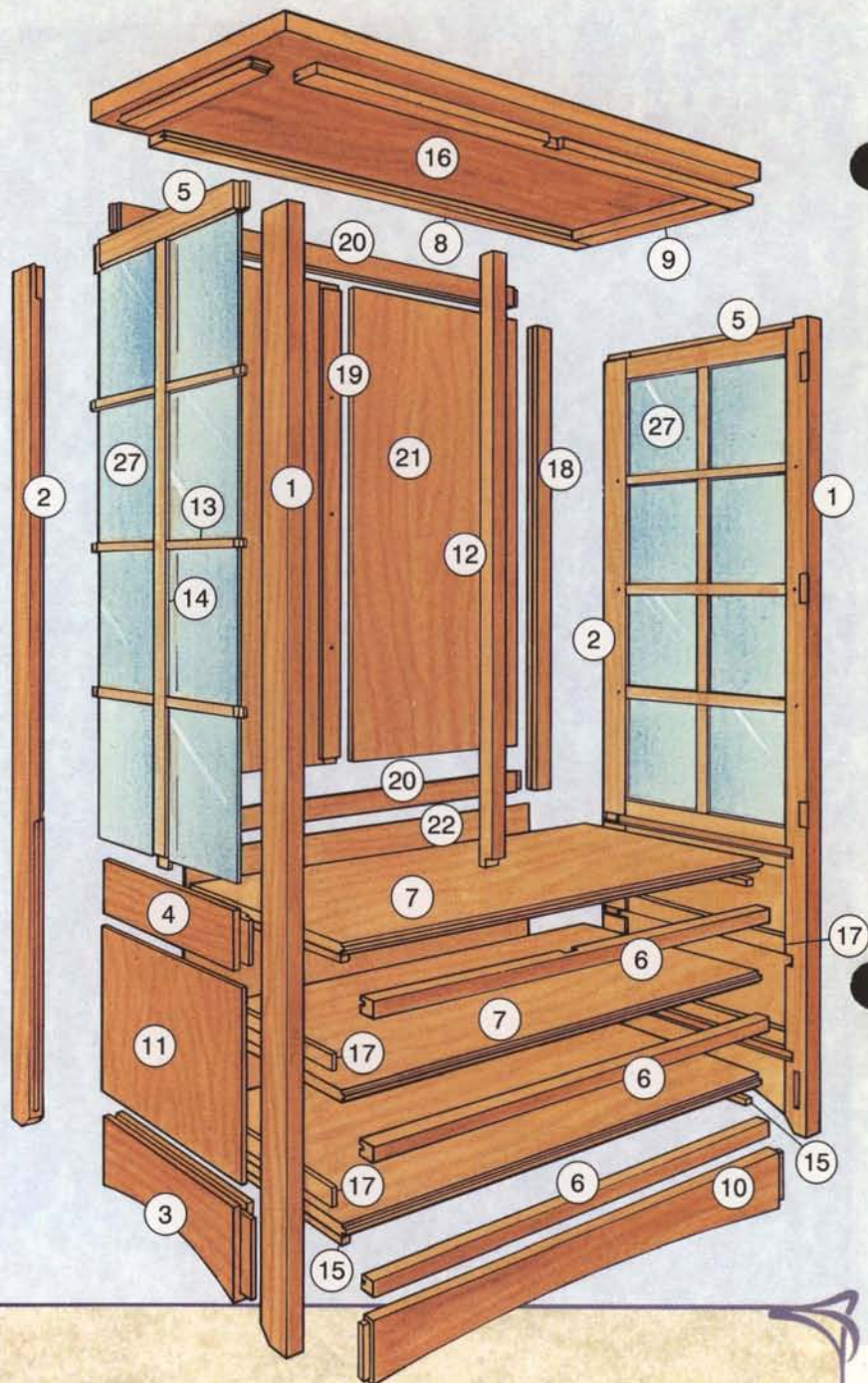
Combine quartersawn white oak and cast copper hardware to recreate a classic furniture style.

By Rick White

Technical drawing of a window frame with dimensions. The drawing shows a side view of the frame with various components and their measurements.

Dimensions:

- Top vertical dimension: 2"
- Left vertical dimension: 10"
- Left vertical dimension: 19"
- Right vertical dimension: 17 3/4"
- Right vertical dimension: 17 3/4"
- Right vertical dimension: 22"
- Right vertical dimension: 14"
- Right vertical dimension: 6"
- Bottom right vertical dimension: 3 3/4"
- Horizontal dimension (top): 5 1/4"
- Horizontal dimension (middle): 1"
- Horizontal dimension (bottom): 8 3/4"
- Vertical dimension (bottom left): 1 1/4"
- Vertical dimension (bottom left): 6 3/4"
- Vertical dimension (bottom left): 3 3/4"
- Vertical dimension (bottom left): 1 1/4"
- Vertical dimension (bottom left): 6 3/4"
- Vertical dimension (bottom left): 3 3/4"

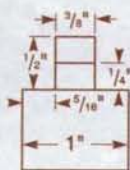


T x W x L			
1 Front Side Stiles (2)	1¼" x 2½" x 69"	15 Support Cleats (4)	1/2" x 1/2" x 14½"
2 Rear Side Stiles (2)	1¼" x 2½" x 69"	16 Top (1)	1¼" x 17" x 49"
3 Bottom Side Rails (2)	1¼" x 4½" x 12½"	17 Drawer Slide Shims (4)	3/8" x 1¾" x 11½"
4 Middle Side Rails (2)	1¼" x 3¼" x 12½"	18 Upper Back Stiles (2)	3/4" x 2½" x 47¼"
5 Top Side Rails (2)	1¼" x 2" x 12½"	19 U. B. Center Stile (1)	3/4" x 2½" x 43"
6 Dust Panel Rails (3)	1¼" x 1¼" x 44½"	20 Upper Back Rails (2)	3/4" x 2½" x 43¼"
7 Dust Panels (3)	3/4" x 15½" x 45¼"	21 Upper Back Panels (2)	1/4" x 19½" x 43"
8 Subtop Stiles (2)	3/4" x 1¾" x 45¼"	22 Lower Back Panel (1)	1/4" x 16¼" x 45¼"
9 Subtop Rails (2)	3/4" x 1¾" x 12¾"	23 Ball Catches (4)	1/4" x 1¾" Brass
10 Apron (1)	3/4" x 3¾" x 45¼"	24 Shelves (3)	3/4" x 13⅝" x 44⅜"
11 Side Panels (2)	1/2" x 12⅝" x 15⅝"	25 Shelf Banding (3)	3/4" x 3/4" x 44⅜"
12 Center Divider (1)	1" x 1¼" x 48⅜"	26 Glass Retaining Strips (16)	5/16" x 5/16" x 96"
13 Side Horiz. Muntins (6)	1¼" x 1" x 13⅞"	27 Side Frame Glass (16)	1/8" x 5¾" x 10½"
14 Side Vert. Muntins (2)	1¼" x 1" x 44⅝"	28 Shelf Supports (18)	1/4" peg (brass)

- 45 bd. ft. of 1 1/4" quartersawn white oak
- 13 bd. ft. of 3/4" quartersawn white oak
- 10 bd. ft. of 1/2" quartersawn white oak
- 15 bd. ft. of 1/2" poplar
- One sheet of 3/4" white oak plywood
- One sheet of 1/4" white oak plywood

Making the Muntins

Begin making the side frame muntins (pieces 13 and 14) by ripping rabbets along two edges of your stock, as shown in the elevation at right.



The Muntin Tenons

Cut all the front faces of the tenons first, then adjust the set-up and cut all the back faces.

After cutting the rabbets, measure your side assemblies to get the muntin lengths you actually need, making sure to include the tenons. Cut your muntins to length, then form the tenons, as shown in the detail above.

The Muntin Half Laps

Where the muntins cross each other you'll need to cut a half lap joint, as shown above. In all cases, the vertical muntins cross on top of the horizontal muntins. Layout the joints so you get the openings shown in the **side frame elevation** on page 15, and complete your machining on a table saw equipped with a dado blade, a miter gauge and a set-up block. When you get to the doors in this project, you can follow the same steps for making their muntins.

each end of the rails.) Sand the side panels and cut them to size, then dry fit all the parts for the side assemblies to check the fit of the joints.

Stickley Muntins

Muntins are one of the most distinctive features on many Stickley pieces, giving the cabinets a stately, well constructed appearance. Step by step instructions for making the muntins are described at left. I recommend cutting an extra muntin or two to use as test pieces for cutting the joints.

Once the muntins are completed, assemble the muntin frames without glue to check the fit of the half laps, then slip the muntin frames into the side frame assemblies to check the overall fit. If everything fits properly, take the side assemblies apart and spread glue on the joints. I suggest that you work on one side at a time, first putting the muntin frame together and then building the rails, stiles and panel around it. Don't forget to check each assembly for squareness.

Connecting the Side Frames

Believe it or not, you're close to seeing your cabinet come together, but first you need to rout several dados and rabbets in the side frames in preparation for the assembly. Layout the stopped dados for the dust panels, as shown in the **side frame elevation**, and chuck a 3/4" straight bit in your router. Clamp a straightedge jig like the one shown above in **Figure 3** along each layout line, and rout 3/8" deep dados (avoid cutting into the side panels). Follow the same routing procedure to cut a 3/4" wide rabbet at the top of each side assembly for joining the subtop frame to the sides. Use a chisel to square the stopped ends of all the dados.

Rabbet the back edge of each side frame for installing the back assemblies (see **side elevation**). Since the upper back assembly is 3/4" thick and the lower back is 1/4" thick, the 3/8" wide rabbets must be cut at two different depths—an easy job for your router and its accessory fence. Be sure to square the stopped end of the deeper rabbets with a chisel.

To reinforce the top and bottom

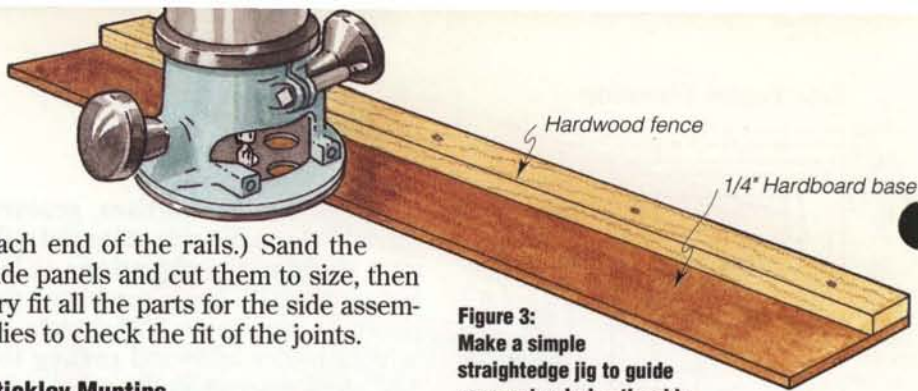


Figure 3: Make a simple straightedge jig to guide your router during the side assembly dado and rabbet cuts.

dust panels, I installed support cleats (pieces 15) under each one, as shown in the **exploded view** on page 14. Cut your cleats to size and set them aside until you're ready to assemble the cabinet.

Now cut out the **full size patterns** of the apron and bottom side rails and trace the shapes onto your stock. Use a saber saw to cut the gradual curves, and smooth the cuts with your drill and a drum sander. Once you sand the edges you'll be ready to assemble the cabinet.

Since this assembly is so large you might want help putting it all together. First, have your helper hold the side frames on their back edge while you clamp the top dust panel into its dados. Next, hold the cleats in position so you can drill pilot holes for screwing them to the dust panel and side rail. Once the pilot holes are drilled spread glue on the cleats, in the dados and in the apron mortises, slip the apron and top dust panel into place and screw the cleats to the assembly. At this point I recommend clamping the subtop frame to the sides, without glue, to keep the assembly square. Now glue the middle dust panel to the sides, then add the bottom dust panel and two more cleats (be sure to glue the top edge of the apron to the bottom dust panel). Check the structure for squareness.

Measure your cabinet for the center divider (piece 12) and cut a piece to fit. Form a 1" long tenon on its lower end and slip the divider into the top dust panel mortise. Now drill a countersunk pilot hole through the subtop's front stile and into the divider (see **subtop elevation** at right), and drill several angled pilot holes through the subtop into the side frames. Remove the subtop frame and drill the counterbored pilot holes for screwing the top (piece 16) to the carcass. Drill standard pilot holes in the subtop's back

stile and elongated holes in the front stile (see subtop elevation) to allow for wood expansion.

Glue the center divider and subtop frame into the cabinet, and drive screws to secure the subtop to the side frames and the divider.

There's one more item to take care of while you're still dealing with the main carcase. The drawer slides must be mounted flush with the inside edges of the stiles, so you'll need a shim (pieces 17) for each slide. Cut the stock to fit against the side panels in your cabinet, then drill oversized holes in the shims for mounting them to the panels. Go ahead and screw them into place, but don't use any glue or you'll restrict the movement of the panels.

The Top and Back

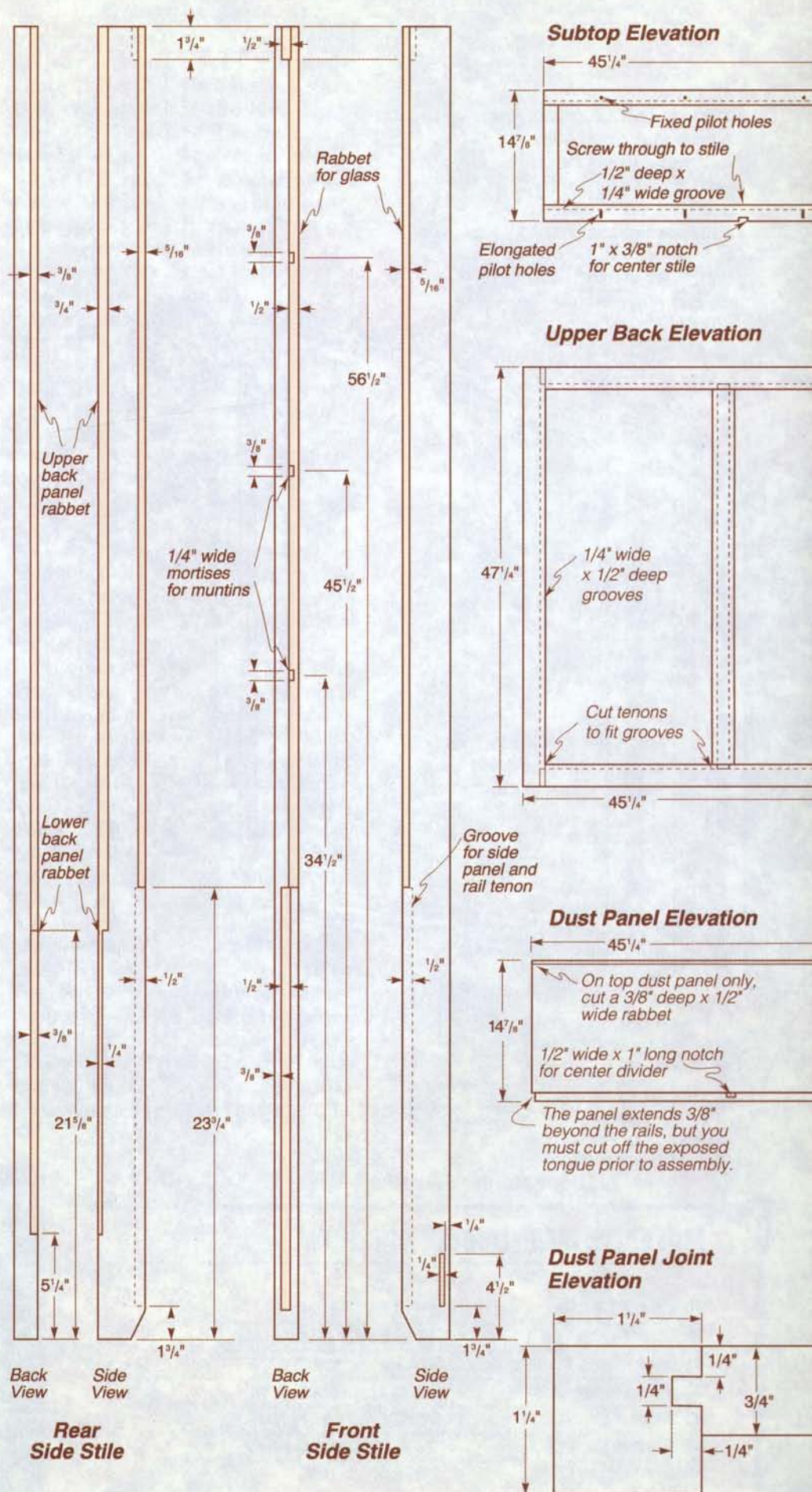
Joint and glue-up several 1 1/4" thick boards for the top (piece 16). While the top is in the clamps, build the back assemblies. I made the upper back assembly a frame and panel structure because you can see it though the glass doors. A piece of 1/4" plywood is adequate for the lower back since this piece is hidden.

Rip the stiles and rails for the upper back (pieces 18, 19 and 20) and cut 1/4" plain-sawn white oak plywood for the two upper panels and the lower back (pieces 21 and 22). Next, rout 1/4" x 1/2" grooves in the appropriate edges of the upper back frame pieces and form tenons on the ends of the rails and center stile, as shown in the **upper back elevation** at right. Glue the pieces together for the upper back and fit the frame into the cabinet.

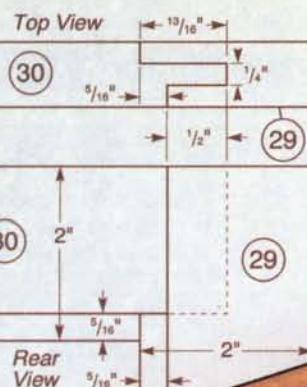
By now the top panel is ready for planing and sanding. Once this is completed, position the top on the carcase with a 1/2" overhang on the front and 1" overhangs on the sides. Extend the pilot holes from the subtop into the top and screw the top to the cabinet.

Making the Doors

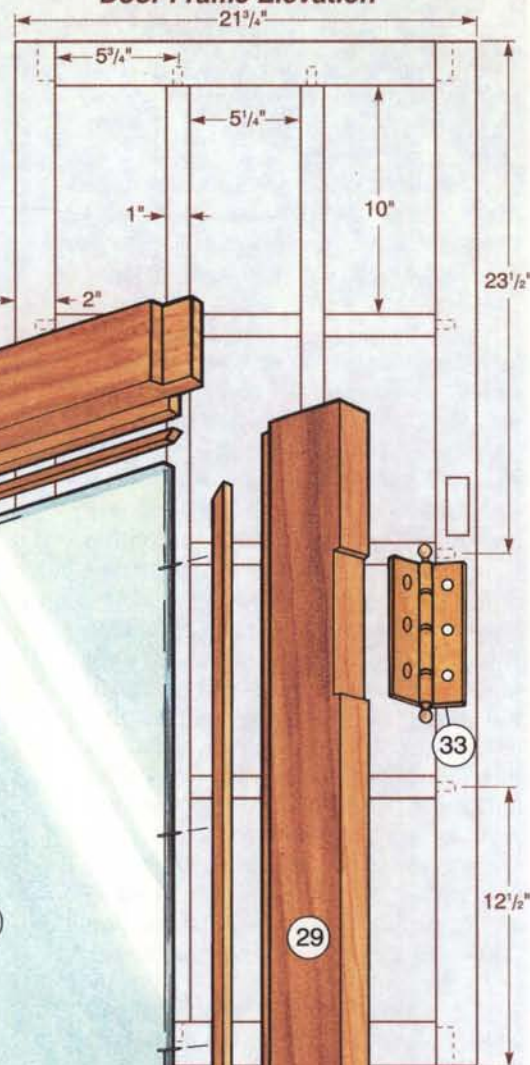
Constructing the doors is much like making the sides, except that they call for 3/4" stock instead of the hefty 1 1/4" material. Rip nicely figured oak for the door stiles, rails and muntins (pieces 29, 30, 31 and 32), and cut the rails and stiles to length. Next, rabbet the inside edge of the rails and stiles



Door Joint Elevations



Door Frame Elevation



and layout the mortises, as shown in the **door elevations** at left. This includes both the rail to stile mortises and the muntin to frame mortises. Form the mortises with your drill press mortising attachment and cut the tenons on the ends of the rails with your table saw.

Put the door frames together without glue and measure for the muntin lengths (remember to add the tenons). Cut your muntins to length, then rabbet the edges and form the tenons just like you did earlier on the side frame muntins (see **door muntin elevations** at left).

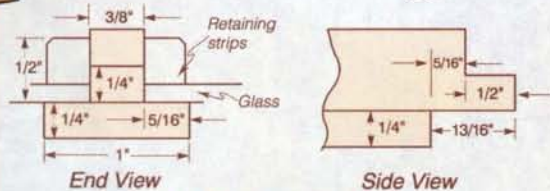
Glue the door parts together, making sure each assembly remains square and perfectly flat. Clean up the glue just after it sets and, once the glue dries completely, sand the frames smooth. Fit the doors to the cabinet and layout the mortises for the hinges (pieces 33), as shown in the **front elevation** on page 14. Carefully chop out the mortises with a chisel and install the doors in the hutch.

Constructing the Drawers

The best drawers are constructed with dovetail joints, and this is certainly what the Stickleys would expect. I have a Leigh jig that allows me to rout the dovetails quickly, but they're easy enough to cut by hand if you don't have a jig (see *Today's Woodworker*, issue 19 for step by step instructions).

Cut 1/2" thick secondary wood, like pine or poplar, for the drawer backs and sides (pieces 36 and 37), and select highly figured 3/4" thick white oak for the drawer fronts (pieces 38). Cut the fronts and rabbet their ends for accommodating the drawer slides (pieces 39), as shown in the **drawer front elevation** at right.

Now use your jig to rout the dovetails, then chuck a 1/4" straight bit in



Door Muntin Elevations

MATERIAL LIST (Doors)

	T x W x L
29 Door Stiles (4)	3/4" x 2" x 47"
30 Door Rails (4)	3/4" x 2" x 19 3/4"
31 Horiz. Door Muntins (6)	3/4" x 1" x 19 3/4"
32 Vert. Door Muntins (4)	3/4" x 1" x 44 5/8"
33 Hinges (3 pairs)	2" x 2 1/2" (antique finish)
34 Door Pulls (2)	1 1/4" x 3 3/4" (cast copper)
35 Door Glass (24)	1/8" x 5 3/4" x 10 1/2"

Stickley Hutch Hardware Kit

A hardware kit is available for this project that includes four authentic Stickley drawer pulls and two door pulls. In addition you'll get three pairs of door hinges, two sets of Accuride drawer slides, four ball catches and support pins for the three shelves.

Item #46938 (use order form)\$179

your router table and rout the grooves for the bottom panels (pieces 40). Cut the bottoms to size and dry assemble the drawers to check the fit of the joints. If everything looks good, glue the dovetails together.

Install the drawer slides in the cabinet and on the sides of the drawers. For consistent positioning of the slides in the cabinet, I always rip a narrow strip of wood (in this case about 1/8" thick) and slip it between the dust panels and each slide while I drill the pilot holes.

Drill the mounting holes for the door and drawer pulls (pieces 34 and 41), as shown in the **front elevation** on page 14. I recommend installing this hardware before doing the finishing, just to make sure that the doors and drawers operate properly. Hopefully, this will save you from unexpected problems later.

Cut 3/4" oak plywood for the three shelves (pieces 24) and glue banding (piece 25) to their front edges. After the glue dries, plane the banding flush with the plywood and sand the shelves smooth.

Before moving on to the finishing, cut plenty of retaining strips (pieces 26) for holding the glass in the cabinet and door frames. To make the retaining strips, first cut a small chamfer on all four corners of four 3/4" x 3" x 96" boards, then kerf the edges on center using a table saw. Next, rip off the edges of the board to yield strips roughly 5/16" square. Finish the strips now, just like you do the rest of the cabinet. Later, after the varnish dries, miter the strips to length for each glass frame in the hutch.

Finishing

You can get as complicated as you want when finishing Stickley style pieces. If you want to go the full nine yards, read Bob Flexner's article in

issue 33 (*The Mission Oak Finish*). But if you want to color your cabinet the way I did mine, you'll just need a quart of Bartley's walnut gel stain. One coat gave me the look I was after, then I followed it with a coat of sanding sealer and two coats of satin varnish. Remember to sand lightly with 400 grit silicon carbide paper between each coat of varnish.

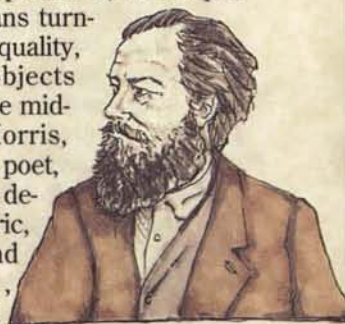
A couple of days after the last coat of varnish dries, begin installing the glass (pieces 27 and 35). Miter the retaining strips for the glass and nail them to the frames with brads. If any raw wood remains exposed after the installation, use a cotton swab to dab on a little stain and it will blend into the rest of the cabinet.

Remount the hinges, pulls and slides, and screw the two backs to the cabinet. Next, drill the 1/4" holes for the shelf supports (pieces 28) in the side stiles, the center divider and the center stile on the upper back assembly. To position the holes, I made a simple layout jig. Cut a 1" wide by 38" long strip of scrapwood and drill a 1/4" hole 34 3/8" from one end. Now hold this strip against each of the cabinet members listed above and drill the holes for the top shelf supports. Next, cut 11" off the undrilled end of the jig and drill the middle shelf support holes, then cut another 11" off and drill the lower holes. The shelf supports are positioned so the shelves line up behind the muntins in the doors and sides.

Install the ball catches (pieces 23) for holding the doors shut and set the shelves into the cabinet. This completes your Stickley reproduction. While your china hutch may not command the high price tag of the originals, it didn't cost you a year's salary to make either. And who knows, with time your piece may become more valuable than anything the Stickleys ever built. ■



The Arts & Crafts movement of the late 1800s developed as a rejection of Victorian values and decorating tastes. In Britain, movement leaders like John Ruskin and his disciple, William Morris, struggled to improve the oppressive factory conditions and railed against the ornate, poorly made goods they produced. As an alternative, they advocated the revival of medieval guilds, or cooperatives, made up of skilled artisans turning out high quality, functional objects for use by the middle class. Morris, an architect, poet, and prolific designer of fabric, wallpaper and furniture, emphasized the wise use



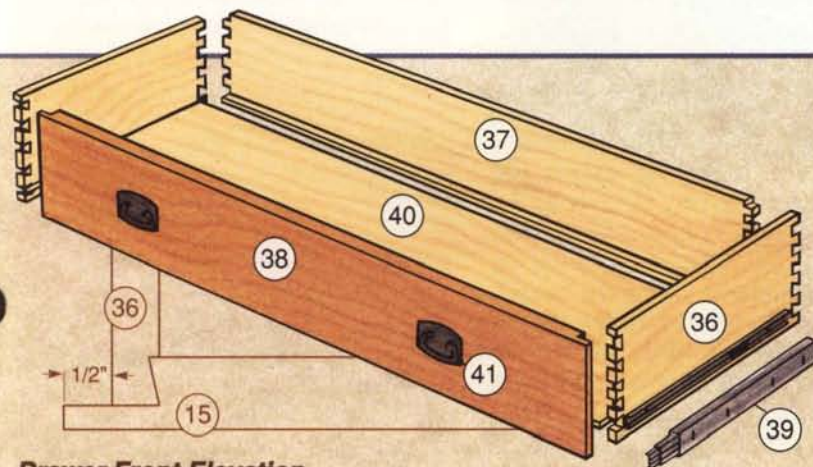
William Morris

of machinery in combination with handwork—an idea that was very appealing to a young American woodworker named Gustav Stickley.

Working from Morris' model, Stickley began building "sensible" furniture for the common man. His simple designs relied on the beauty of the wood and exposed



joinery for their adornment. Despite the short-lived success of his businesses, this approach to furnituremaking continues to be Stickley's legacy.



Drawer Front Elevation

MATERIAL LIST (Drawers)

	T x W x L
36 Drawer Sides (4)	1/2" x 6 5/8" x 15 1/2"
37 Drawer Backs (2)	1/2" x 6 5/8" x 43 1/2"
38 Drawer Fronts (2)	3/4" x 6 5/8" x 44 1/2"
39 Drawer Slides (2 sets)	14" Accuride
40 Drawer Bottoms (2)	1/4" x 15" x 43"
41 Drawer Pulls (4)	1 7/8" x 3 3/4" (cast copper)

The Toddler's Tanker

Follow our full size patterns and step by step instructions to build this scaled down eighteen wheeler —the second in our convoy of over-the-rug haulers.

By David Larson

The toy car carrier featured in issue 32 was such a hit with the kids that I decided to get right back to the shop and try my hand at another eighteen wheeler. After considering several truck styles, I settled on an oil tanker because of its distinctive shape and the challenge of making the catwalk for the top of the tank. Building the tanker to the same scale as the car carrier makes the trailers and trucks interchangeable.

My tanker truck has plenty of bells and whistles, but not so many that it becomes a "look but don't touch" toy. The catwalk, cab lights and front grill, along with the realistic rubber tires, all contribute to its authentic appearance and help spark a youngster's imagination.

Constructing the tanker takes about ten hours and requires a couple feet of lumber and an assortment of wheels, axles, wood buttons and dowels (see hardware kit at right). To speed the project along and to overcome the difficulty of clamping so many small parts, I recommend using five minute epoxy for all the joinery. As with all wood toys, sand the edges thoroughly and be sure to prevent any parts from sticking out where they might catch on clothing and possibly break off.

Shift into Gear

Begin building your oil tanker by machining the cab (piece 1). Since shaping the cab requires care and planning to keep your fingers a safe distance from the saw blade, I recommend that you machine a larger piece

than needed, then cut it down to size after completing the opening.

Rip a 1" thick x 6" wide x 1 $\frac{7}{8}$ " long piece of walnut for the cab, then tilt your blade 25° and trim the cab's front edge, as shown in the **cab elevation** on page 22. (Note: The grain of this piece runs front to back, so end grain will show on the front edge.) Next, lower the blade and move the fence to make a cut to define the inside of the front window posts, as shown in **Figure 1**. Once you've defined the front posts,

straighten the blade and make a cut to define the

back window posts, then make a series of ripping cuts to nibble away the waste between the posts, as shown in **Figure 2**. Complete the cab by nibbling away the remaining waste and cutting it to length. Be sure to use a miter gauge with a wood fence

Details like the catwalk, front grill and rubber tires give this oil tanker the same realistic appearance as its predecessor, the car carrying semi shown above.

Toy Tanker Hardware Kit

A hardware kit is available for this project that includes 18 wheels and hubs, 10 axles, 2 headlights, 5 running lights, 3 caps, three 1/8" x 18" birch dowels, and one 1/4" x 9" walnut dowel.

Item # 51235 (use order form)\$16.95

Plans and a hardware kit for the car carrier shown above are also available.

Item #97255 (issue 32).....\$4.95

Item #98120 (hardware kit).....\$16.95



Figure 1: Rip the front edge of the cab at a 25° angle, then lower the blade and move the fence 5/16" to cut the inside edge of the front posts.



Figure 2: Return the blade to 0° and define the back posts, then clear the waste from between the posts by moving the fence a little bit for each pass.



Figure 3: Support the cab with a miter gauge while removing the waste that remains between the cab posts and to cut the piece to length.

to back up your stock during the crosscuts (See **Figure 3**).

With the cab machining done, cut stock to size for the engine and sleeper (pieces 2 and 3). Put epoxy on the ends of the cab posts and lightly clamp the cab to the engine, then roundover the top edges of the sleeper with 100 grit sandpaper and epoxy it to the engine and cab. Be sure to put a few drops of resin on each of the cab's back posts to reinforce these fragile parts.

Cut the truck base (piece 4) to size and trace the **full size base pattern** (found between pages 12 and 13) onto the stock. Now cut the base to shape using a 1/2" dado blade in your table saw. Set the stock on edge and pass it over the blade, using your miter gauge, the saw's fence and a set-up block to regulate the cuts, as shown in **Figure 4** on page 23. Raise and lower the blade as you go to cut right to the outline. Once the base is shaped, layout the drilling locations for the axles, smokestacks and hitch (pieces 5 through 8), as shown on the full size pattern, and bore the holes with a drill press. Wrap up your work on the truck body by epoxying the base to the engine, cab and sleeper.

Adding the Truck Trim

Make yourself a dowel cutting jig like the one shown in *Tricks of the Trade* on page 4 and cut dowels for the smokestacks. Next, drill a 1/8" diameter x 1/2" deep hole in one end of each lower stack as shown in **Figure 5** on page 23. Epoxy the upper stacks into the lower stacks and slip these assemblies into the holes in the base (without glue). Pencil a line on each upper stack that's flush with the top of the sleeper, then trim the dowels to this line with a chisel held at a 45° angle. Now epoxy the smokestacks into the base and to the sleeper.

Cut the bumper (piece 9) to size and roundover its ends with a palm sander, as shown in the **full size pattern**. Next, hold the bumper against the base and drill pilot holes for the bumper pins (pieces 10). Cut the pins to length using the dowel cutting jig, then epoxy the bumper to the base and drive in the pins. Layout and drill 1/2" deep holes for the headlights (pieces 11), then shorten the stem on a couple of axles and epoxy them into the holes. Cut a walnut dowel for the hitch and epoxy it into its hole in the base.

To make the grill (piece 12), cut a 3" x 6" piece of 1/4" thick maple, then

tilt the table saw blade 45°. This is another instance when machining an oversized piece will make the operation safer. Raise the blade 3/32" and make a series of passes, adjusting the fence 1/4" between each pass to form the pattern shown in the **full size pattern**. Once you've kerfed a 1 1/2" wide strip, cut the grill to size and epoxy it to the front of the engine.

Make the cab running lights (pieces 13) by using a belt sander to flatten one side on five axles. Clamp the sander upside down in a vise, then hold the axles with a pliers while pressing them against the belt. Cut the axle stems to length with a fine handsaw and epoxy each one to the roof. Use a square to keep the lights in line. After the epoxy sets, angle the stems with a sharp chisel, as shown in the **running light elevation** on page 22.

Building the Tanker

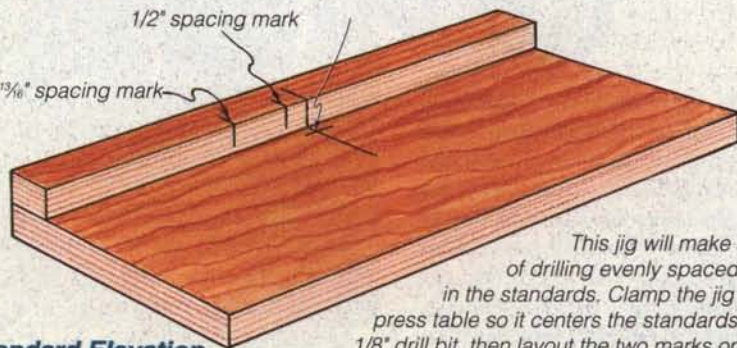
Begin working on the tanker by cutting the base, platform and tank (pieces 14, 15 and 16), then follow the **full size patterns** to lay out the shapes and drilling locations. Drill the holes in the base and platform and trim the tongue end of the platform to shape.

Making the Drill Press Jig

Drill bit location

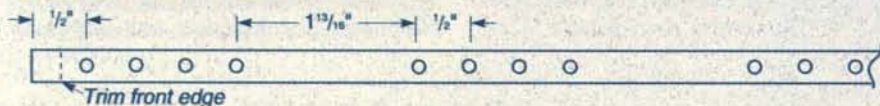
1/2" spacing mark

1 13/16" spacing mark



This jig will make short work of drilling evenly spaced rung holes in the standards. Clamp the jig to your drill press table so it centers the standards under the 1/8" drill bit, then layout the two marks on the fence.

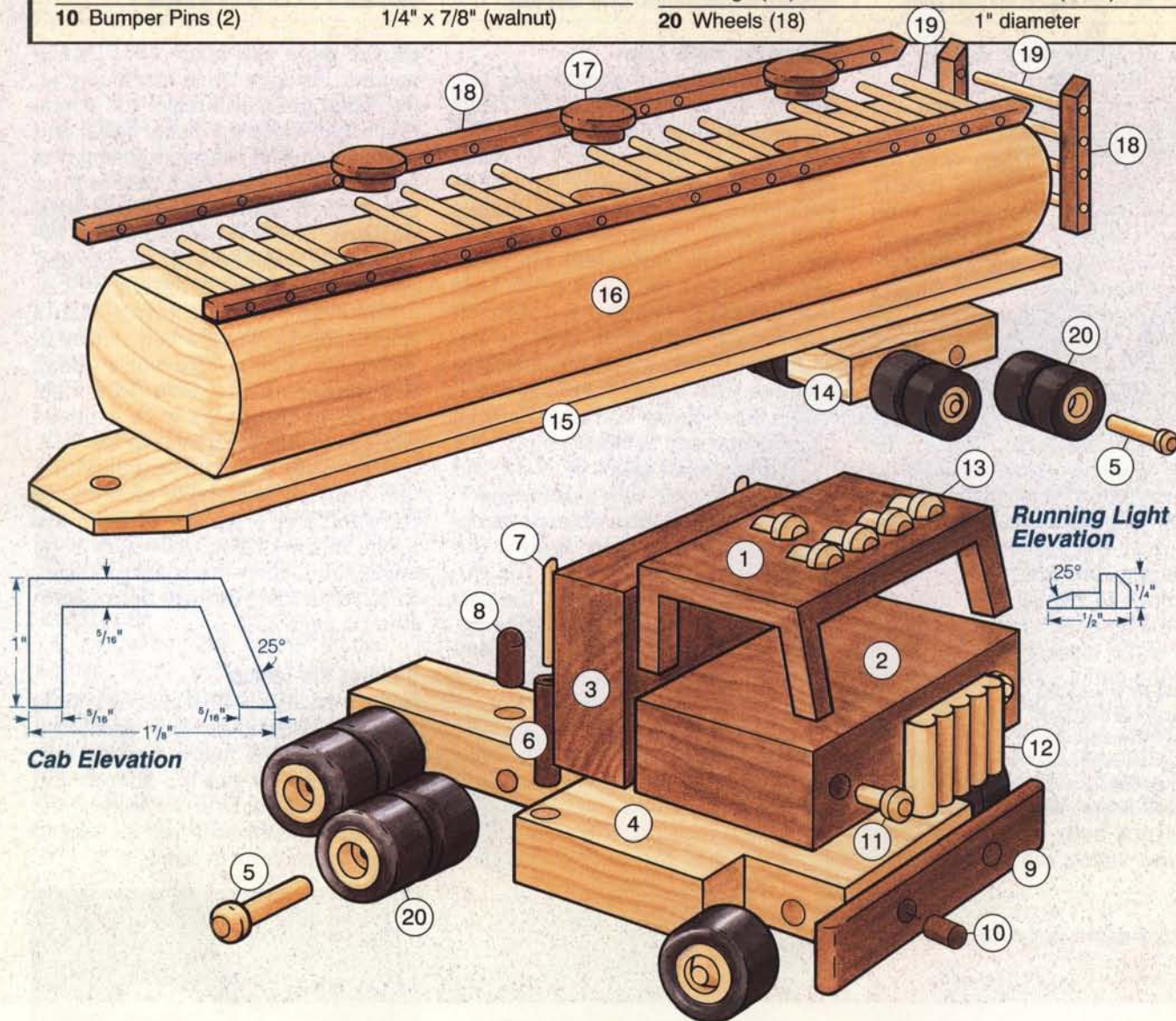
Standard Elevation



Align the end of a standard with the 1/2" mark and drill a hole, then line up this hole with the same mark and drill the second hole, and so on for the third and fourth holes. To start a new set of holes, line up the fourth hole with the 1 13/16" mark.

MATERIAL LIST

	T x W x L		T x W x L
1 Cab (1)	1" x 2 $\frac{1}{2}$ " x 1 $\frac{1}{8}$ " (walnut)	11 Headlights (2)	7/32" x 1 $\frac{1}{8}$ " shaft (maple)
2 Engine (1)	1" x 2 $\frac{1}{2}$ " x 1 $\frac{1}{8}$ " (walnut)	12 Grill (1)	1/4" x 1/4" x 7/8" (maple)
3 Sleeper (1)	7/8" x 2" x 1 $\frac{1}{8}$ " (walnut)	13 Running Lights (5)	7/32" x 1 $\frac{1}{8}$ " shaft (maple)
4 Truck Base (1)	3/4" x 2 $\frac{1}{2}$ " x 5 $\frac{1}{2}$ " (maple)	14 Trailer Base (1)	3/4" x 1 $\frac{1}{8}$ " x 2 $\frac{1}{2}$ " (maple)
5 Axles (10)	7/32" x 1 $\frac{1}{8}$ " shaft (maple)	15 Platform (1)	1/4" x 2" x 13 $\frac{1}{2}$ " (maple)
6 Lower Smokestacks (2)	1/4" x 1 $\frac{1}{8}$ " (walnut)	16 Tank (1)	1 $\frac{1}{4}$ " x 2 $\frac{1}{2}$ " x 12" (maple)
7 Upper Smokestacks (2)	1/8" x 1 $\frac{1}{8}$ " (birch)	17 Caps (3)	3/4" button (walnut)
8 Hitch (1)	1/4" x 7/8" (walnut)	18 Standards (2)	5/16" x 5/16" x 17" (walnut)
9 Bumper (1)	1/4" x 7/8" x 2 $\frac{1}{8}$ " (walnut)	19 Rungs (20)	1/8" x 2" (birch)
10 Bumper Pins (2)	1/4" x 7/8" (walnut)	20 Wheels (18)	1" diameter



Now tilt the table saw blade 45° and trim the corners of the tank block as near to the layout line as possible. Next, shape the block into an oval using a hand plane, then switch to a palm sander as you get close to the final shape. Drill holes in the tank for the caps (pieces 17), then epoxy the tank and the base to the platform.

The key to making the catwalk and ladder assembly is a drill press jig,

which keeps the standards (pieces 18) aligned with the bit and spaces the holes at regular intervals. Make the **drill press jig** shown on the previous page and rip stock for the standards. Clamp the jig to your drill press table so a standard is centered under the bit. Now make pencil marks on the jig fence 1/2" and 1 $\frac{3}{8}$ " from the bit location. Align one end of a standard with the 1/2" mark and drill a hole, then

center this hole on the same mark and drill a second hole, and so on until you drill four holes. Next, to get the larger spacing between the fourth and fifth holes, align the fourth hole with the 1 $\frac{3}{8}$ " pencil mark. Continue this procedure until you've drilled five sets of holes in each standard.

Trim the rungs (pieces 19) to length with the dowel cutting jig and epoxy them into the holes in one standard.

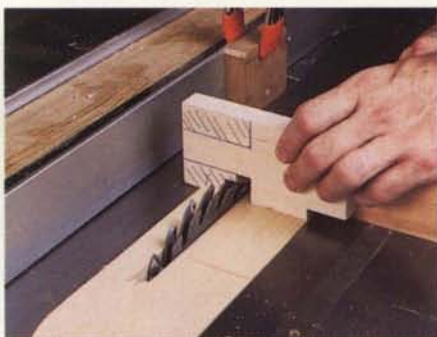


Figure 4: Hold the base on edge to pass it over the dado blade, using the miter gauge and fence (with a set-up block) to control the cuts.

Use a toothpick to work the epoxy into the holes. Wait about five minutes, then epoxy the second standard onto the rungs. When the epoxy is dry, hold the assembly against your belt sander (while it's clamped in a vise) to clean off the edges and roundover the top outside corner of each standard, as shown in the **full size pattern**. After giving it a quick hand sanding, miter the assembly to length for the catwalk and ladder.

Epoxy the catwalk, ladder and caps to the tank, and shear off the squeeze-out with a chisel as soon as it becomes rubbery. Sand the project thoroughly and apply two coats of an oil/varnish blended finish, like Nordic Oil, taking care to avoid getting any in the axle holes. In addition, rub finish on all the wheel hubs and axle heads (but not on the axle stems).

After the finish dries, slip the wheels (pieces 20) onto the axles and put a few drops of epoxy into the holes in the truck and tanker bases. Slide the axles into the holes and, as the epoxy sets, make sure the wheels spin freely and are all level. Give your over-the-rug rig a final check, then take it for a test ride to see how it handles. Now get your ears on and keep an eye out for the smokies. That's a big 10-4, good buddy. ■



Figure 5: To center each smokestack below the drill bit, clamp scrapwood to the table and drill a 1/4" hole, then insert the dowel in the hole.

TODAY'S WOOD

Yew (*Taxus spp.*)

By Gordon Hanson



For centuries, the yew tree has symbolized life and death in many cultures. Early Egyptians honored it as the tree of life, while the Greeks associated it with Hecate, queen of the underworld. In England, yews still stand guard over cemeteries as symbols of everlasting life. And now, as if reality has finally caught up to the legend, researchers are finding that the bark of yew trees contains a substance that may well prove effective in the fight against cancer.

For woodworkers, yew is one of the most desirable softwoods. Its orange-brown coloring with reddish-brown bands makes a striking appearance, and the figured, wavy grained pieces dotted with little black knots are highly prized by carvers and turners. Yew is one of the hardest and densest softwoods, exceeding many hardwoods in these categories, and it steam bends well, making it a favorite choice for the hooped backs of Windsor chairs. The close grain stains fairly well and polishes to a highly lustrous sheen.

Members of the yew family grow in both Europe and North America. While there are characteristics that distinguish the various trees, the wood from all yew species is nearly identical. Yews are cone bearing evergreens, with deeply fluted trunks that contain many knots, two factors which reduce the amount of usable timber from each tree.

Few wide, long planks are harvested, making this species most suitable for small to mid-size projects.

For exterior applications, yew lives on long after many other species succumb to decay. Yew's range of uses includes outdoor furniture, exterior trim and fences. Historically, yew was preferred for archery bows because it is so elastic. When a bow made from yew is unstrung, it will spring back to a straight position.

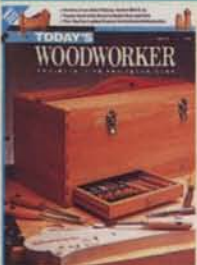
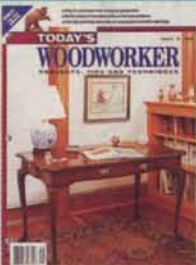
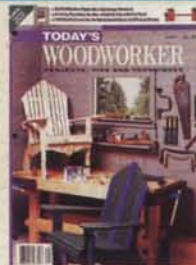
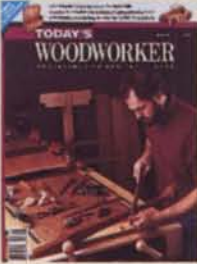
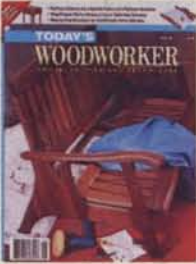
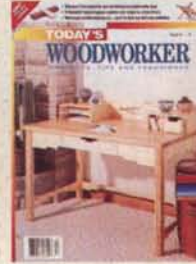
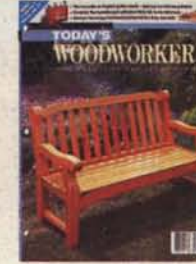
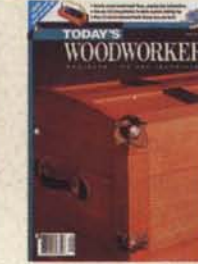
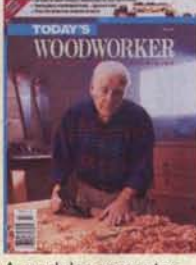
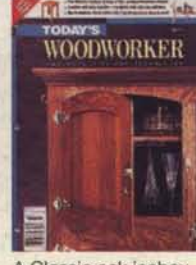
Working with yew can be a little tricky, for any irregularly grained pieces are difficult to plane and frequently tear. Because it's so hard, pre-boring nail and screw holes is a must. In addition yew's slightly oily character can cause occasional gluing difficulties.

Yew heartwood
and sapwood

Unfinished
yew

Yew with
an oil finish

FREE binder when you order six back issues or more!

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More back issues, Craftplans® and kits can be found on the order form between pages 12 and 13.

Two Great Futon Sofa Beds



Take your choice! Futon Sofa I, a classic piece of furniture from one of our most popular back issues, or Futon Sofa II, with a new hinge mechanism for extremely simple operation.

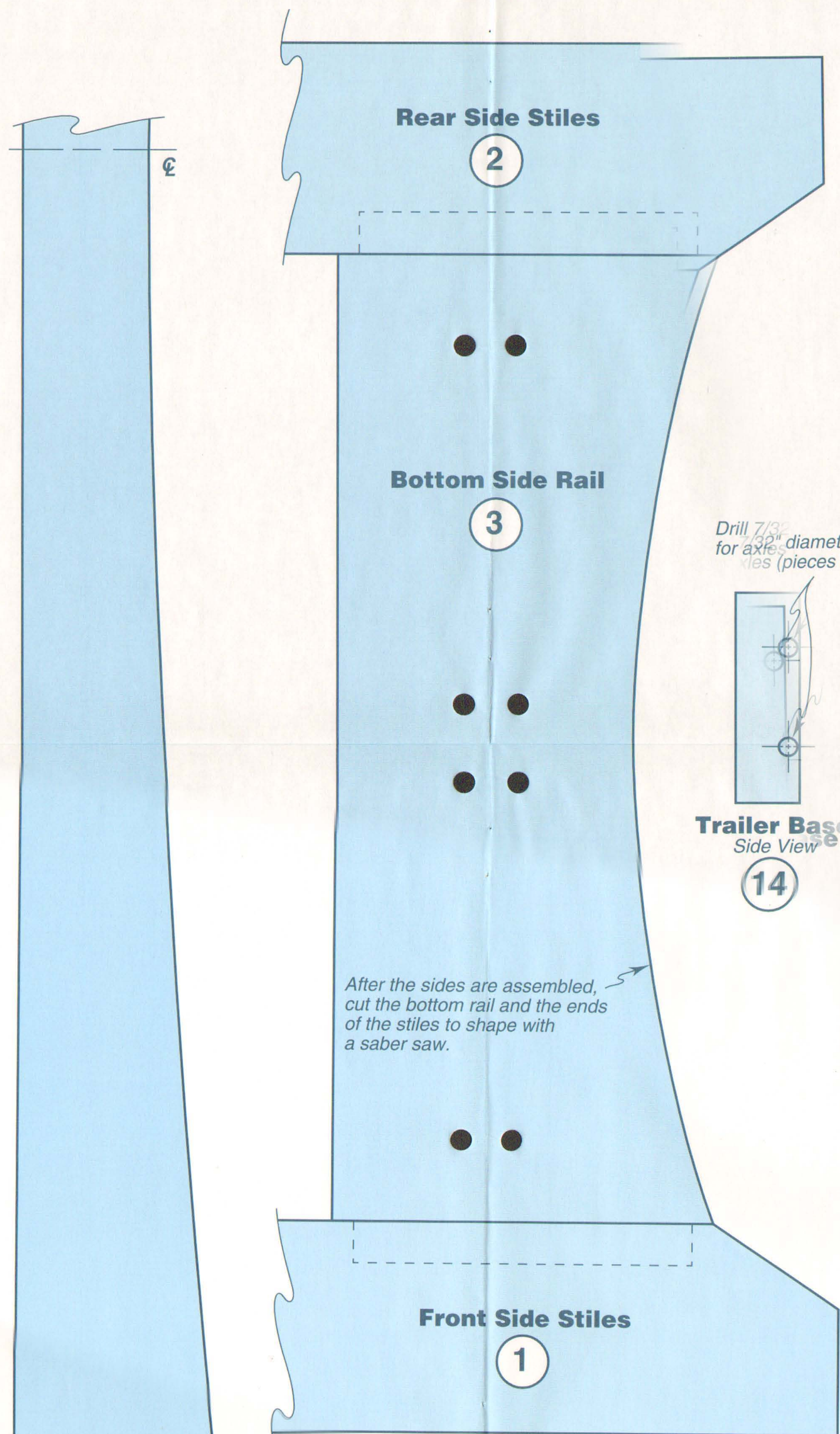
FUTON SOFA II
Built around a custom designed piece of hardware, this futon sofa requires only six inches of clearance from a wall to operate.

Item #20875 (Hardware kit)\$29.95
Item #88973 (Issue 26).....\$3.95



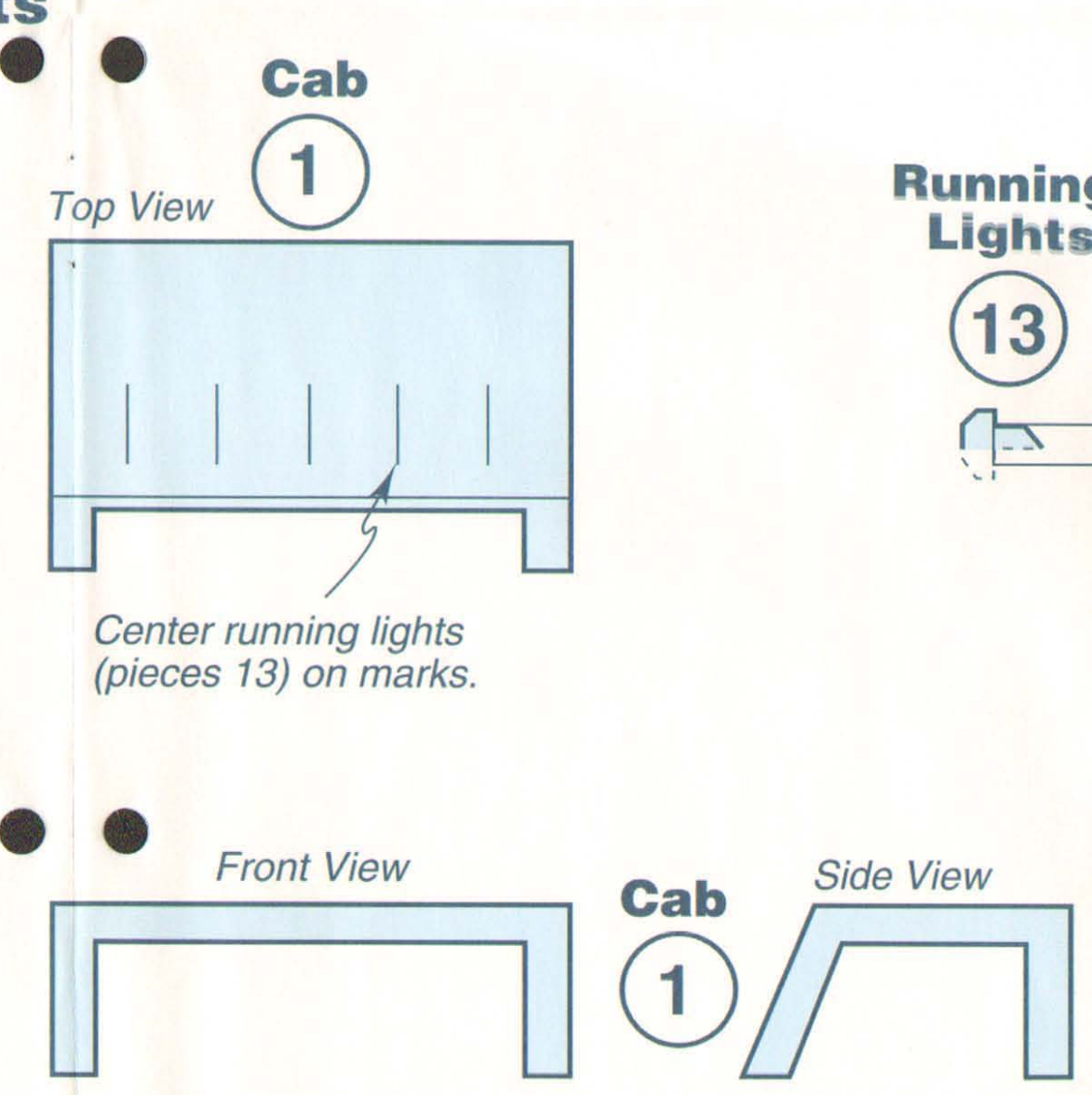
FUTON SOFA I
Still one of our most popular projects, this classic futon sofa makes use of solid brass sewing machine hinges to easily flip into a bed.

Item #88220 (Hardware kit)\$44.95
Item #38448 (Issue 4)\$3.95

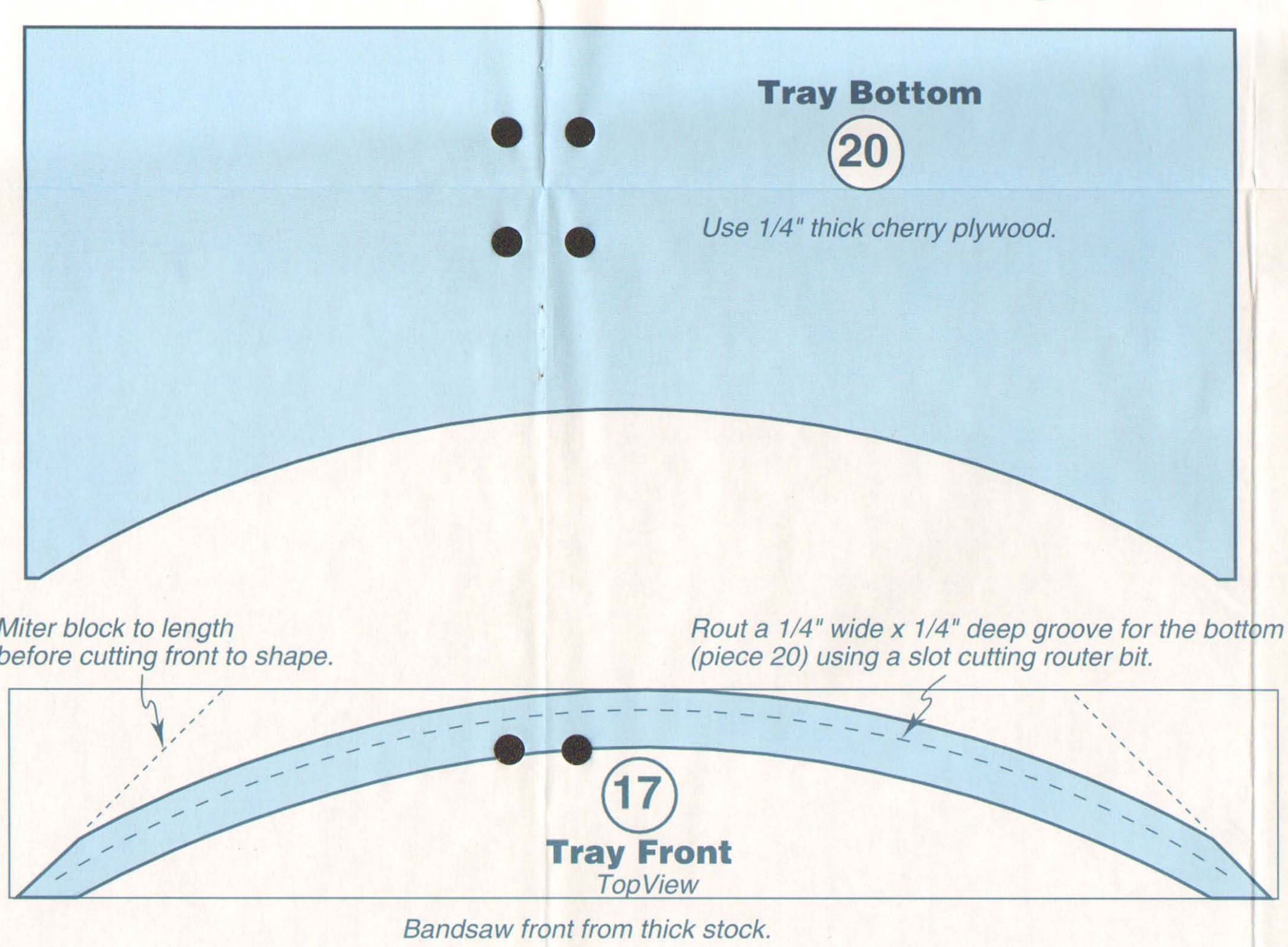


Bandsaw the apron to shape after forming tenons at both ends.

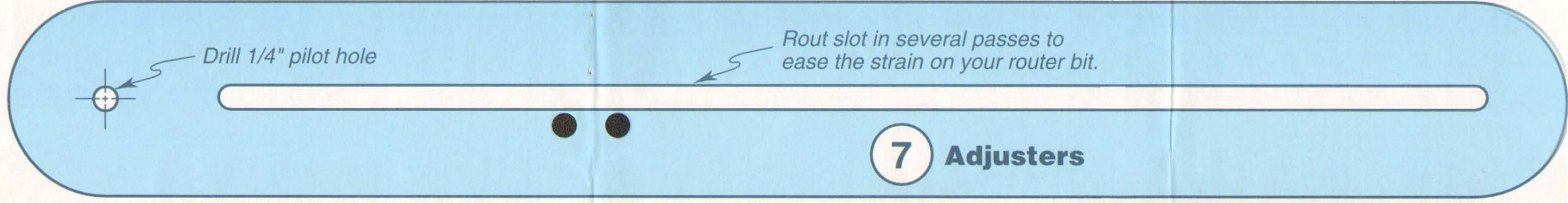
Arts & Crafts Hutch



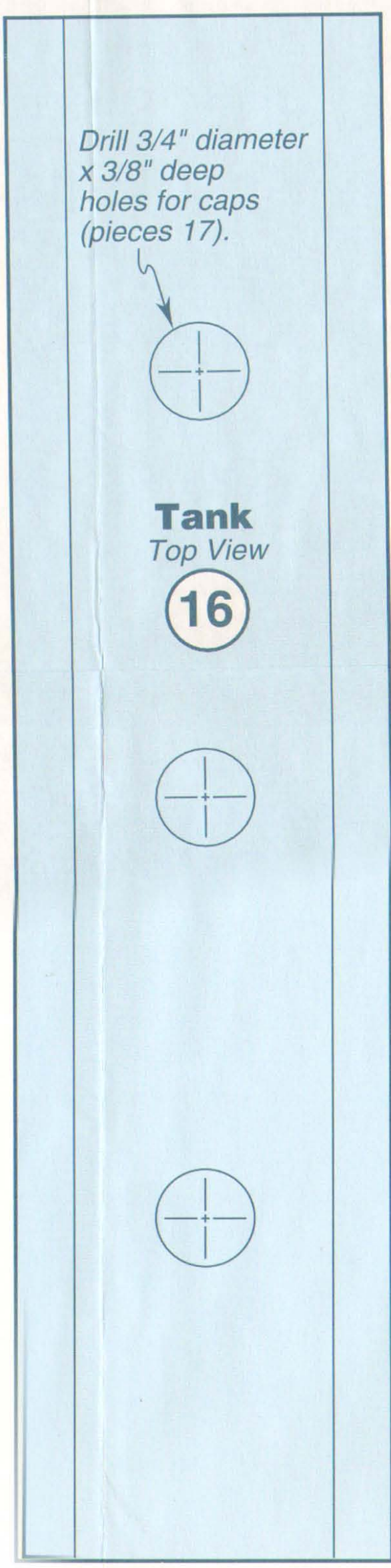
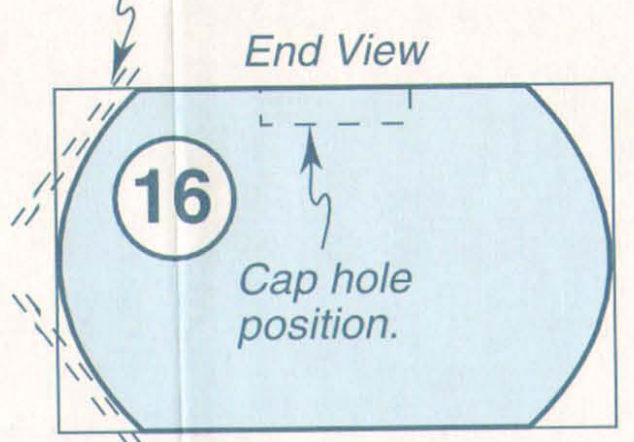
Jewelry Box



Drill Press Jig

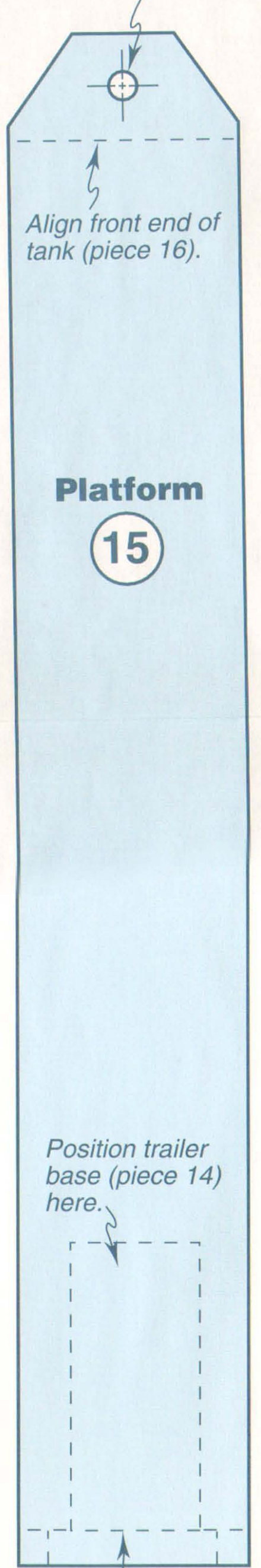


Chamfer block to remove the bulk of the waste, then shape block with a hand plane and sandpaper.

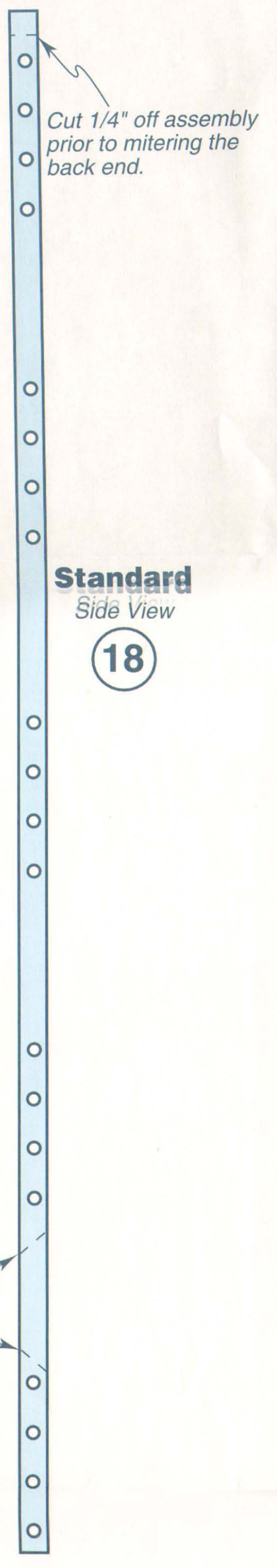
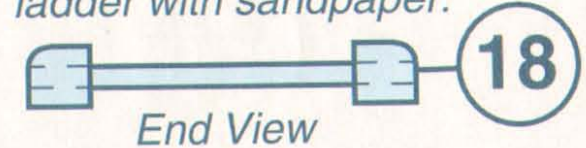


Toddler's Tanker

Drill a 1/4" hole for the hitch (piece 8), then enlarge the hole a little with a rattail file.

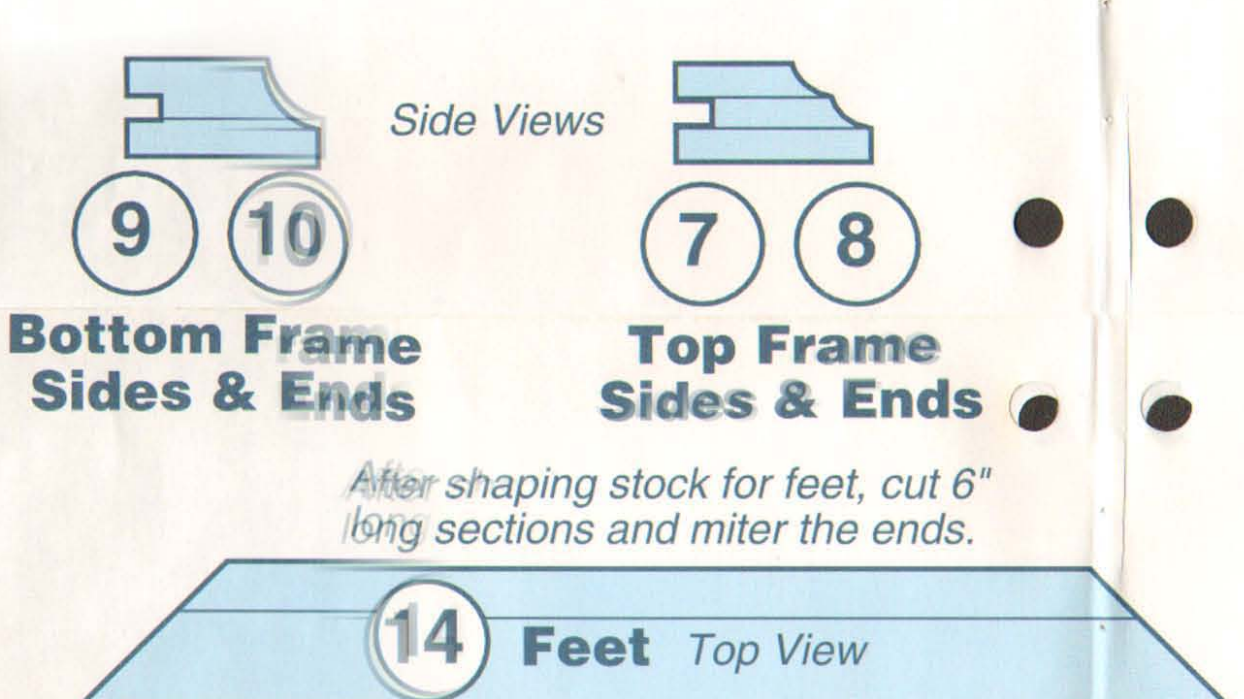
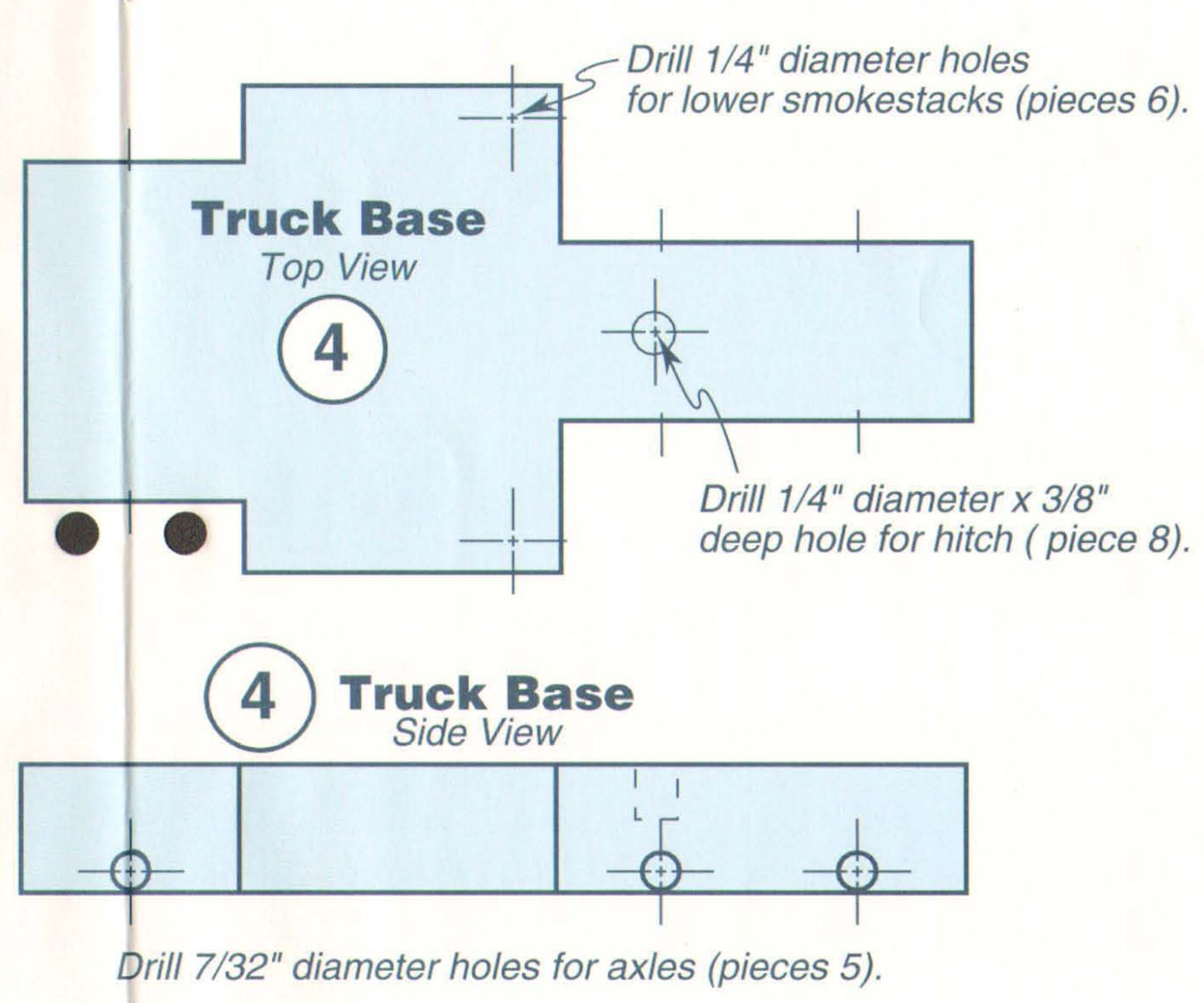
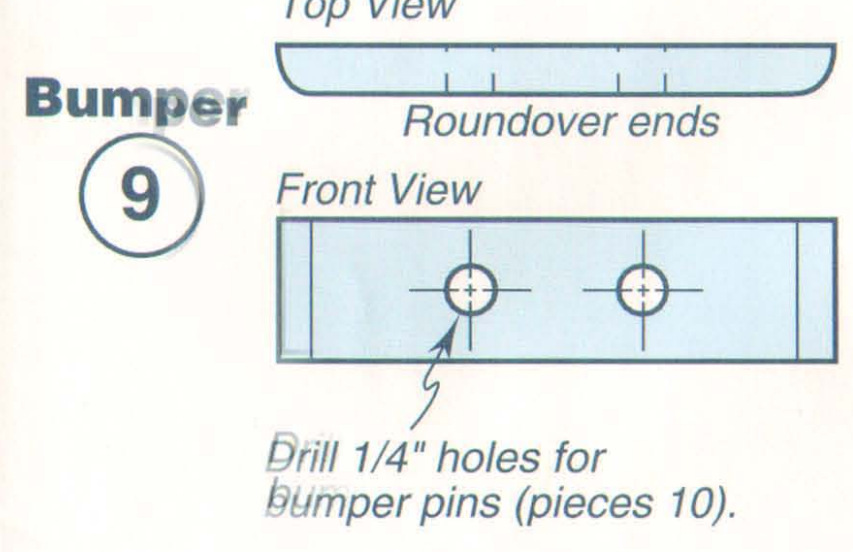
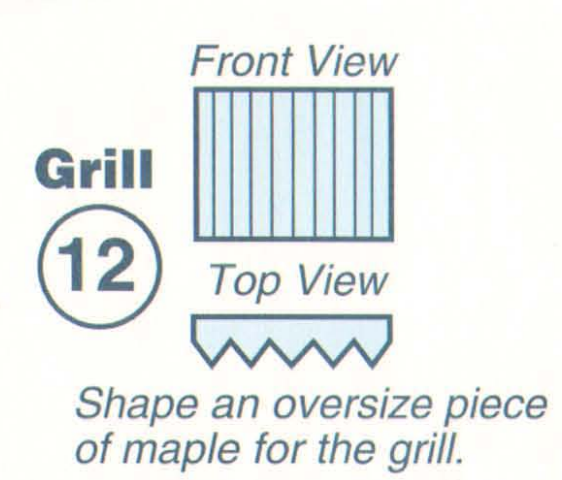
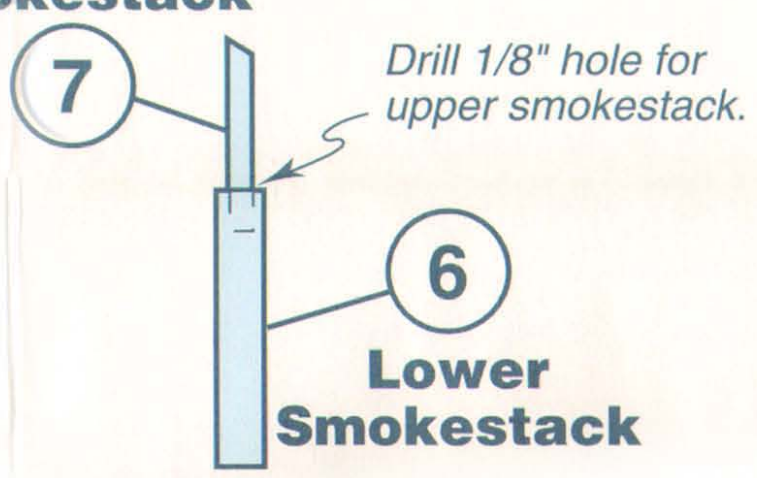


Roundover top outside edges of catwalk and ladder with sandpaper.

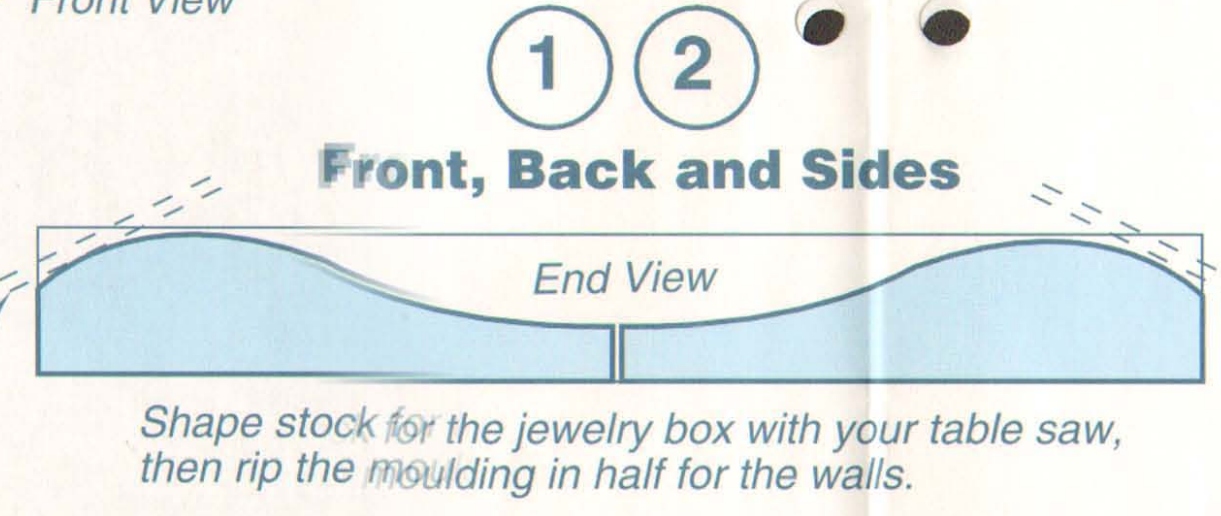
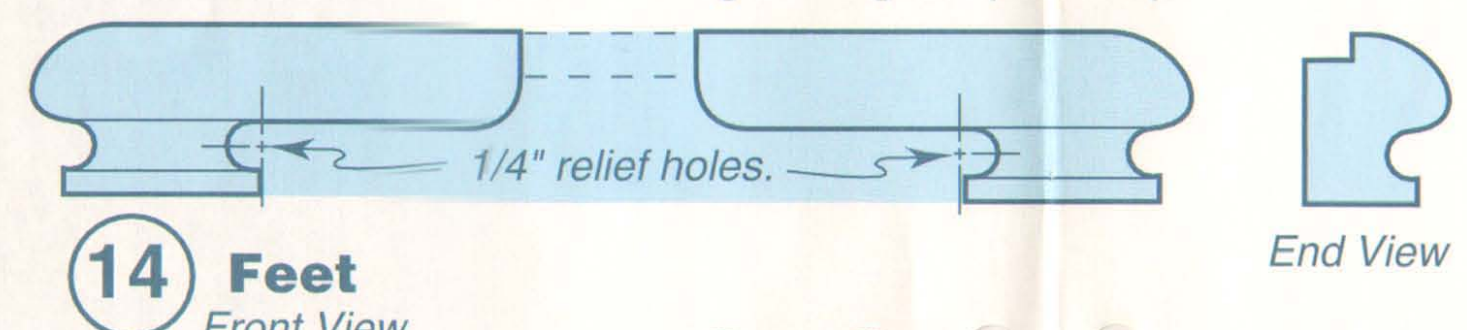


Miter catwalk and ladder to length to fit on tank.

Upper Smokestack



Trace front profile on 6" pieces of stock, drill 1/4" relief holes and bandsaw each pair of feet. Leave a bridge until glue-up is completed.



Full-Size Patterns

■ Open staples carefully, remove pattern and fold staples back in place.

■ Use graphite paper (available at most art supply stores) or cut and trace the pattern onto your stock.

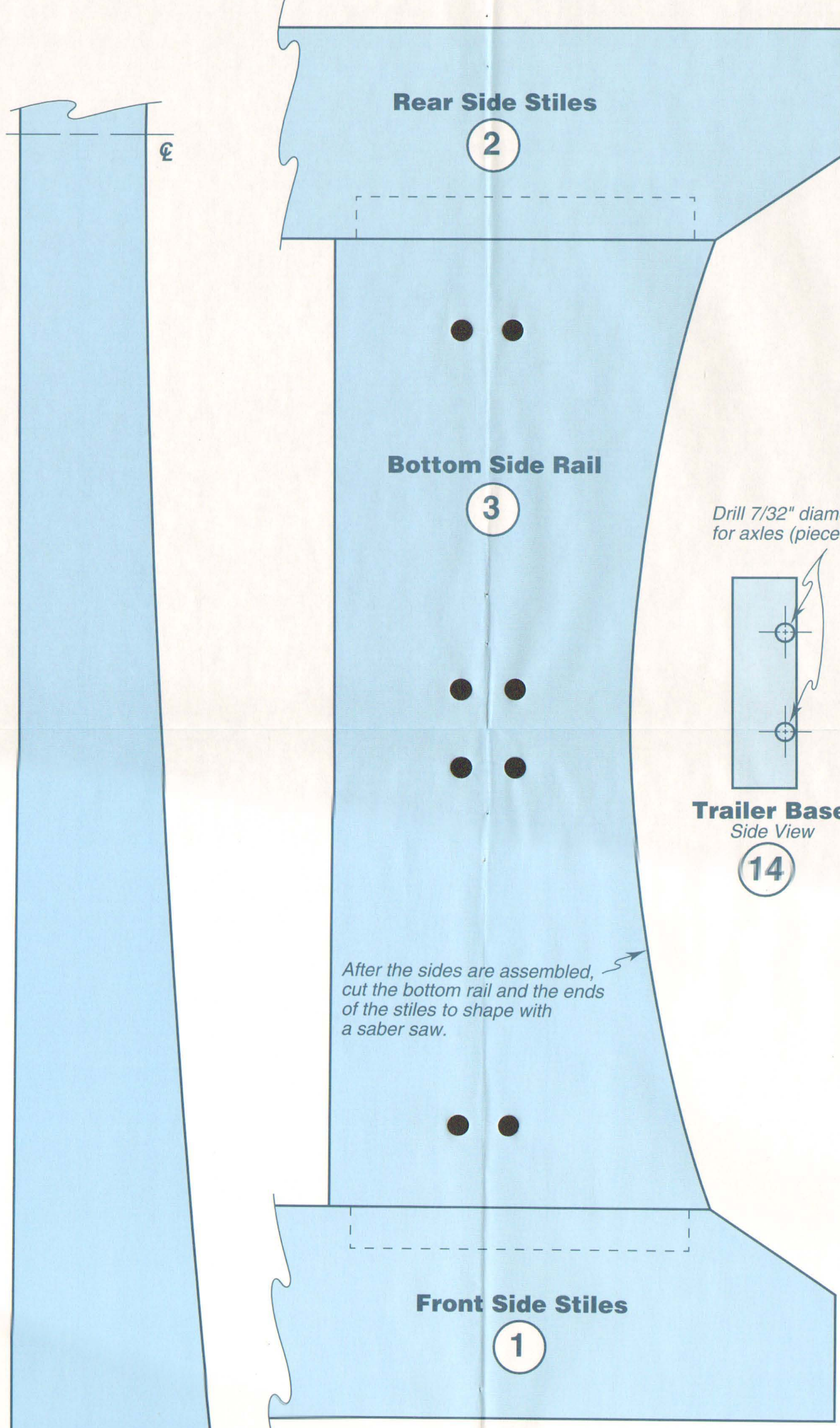
The Stickley Hutch
Includes patterns for the bottom side rails and the front apron.

A Toddler's Tanker
Includes the cab, front base, running lights, bumper, grill, smokestacks, platform, tanker and the catwalk/ladder assembly.

The Jewelry Box
You'll find patterns for the jewelry box walls, feet, tray front and tray bottom.

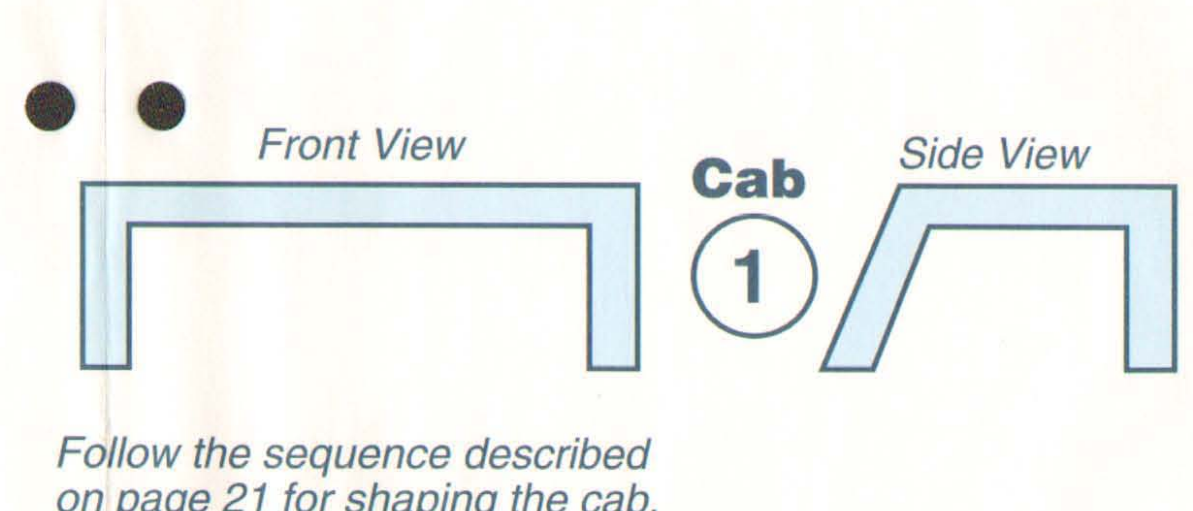
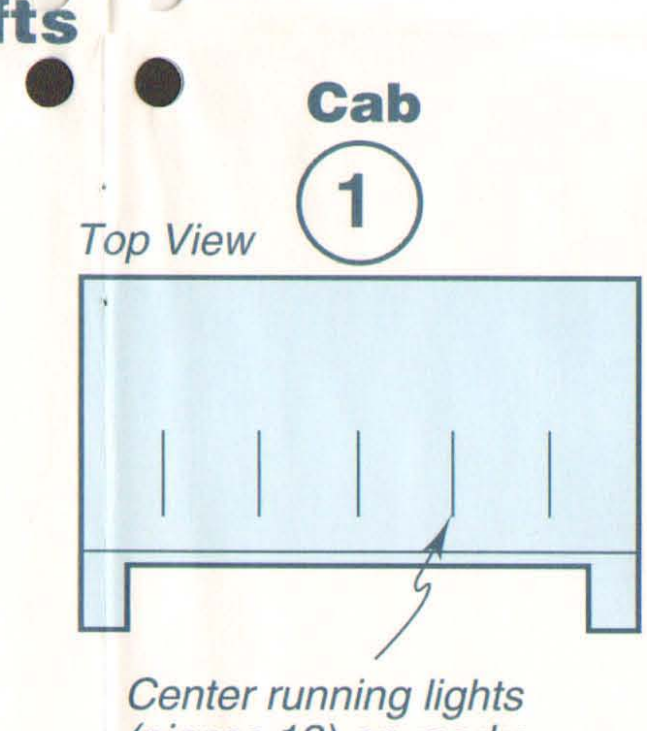
Drill Press Tilt Table Jig
The adjuster pattern.

TODAY'S WOODWORKER
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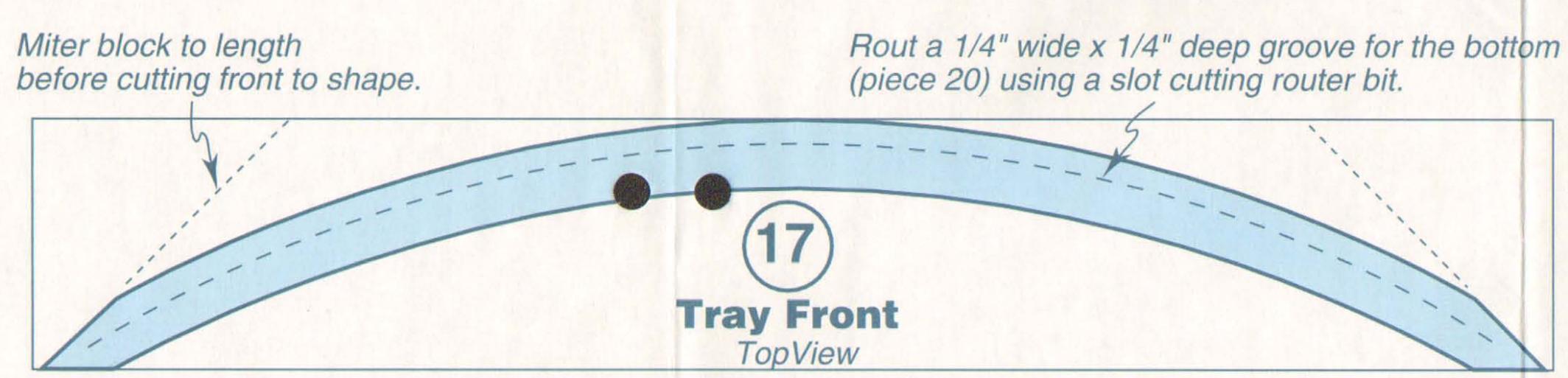
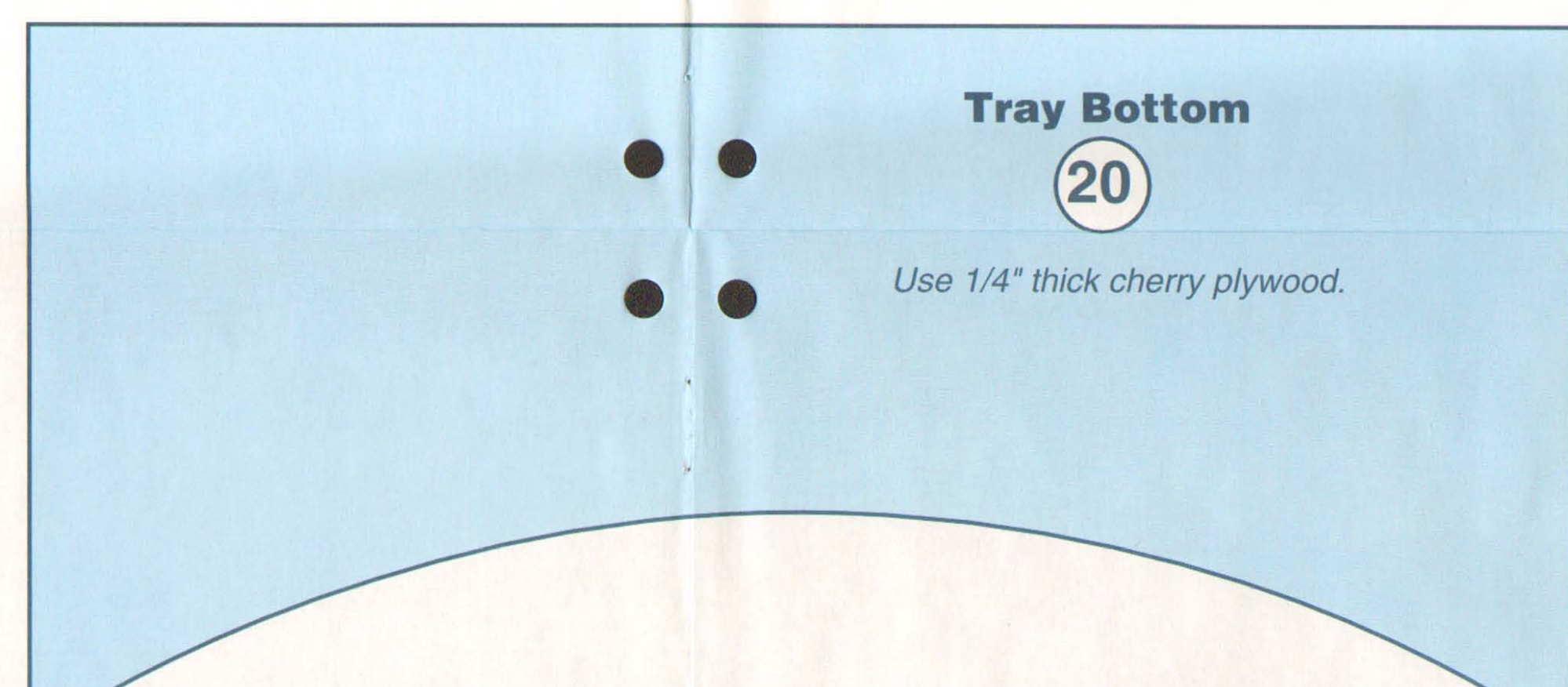


Bandsaw the apron to shape after forming tenons at both ends.

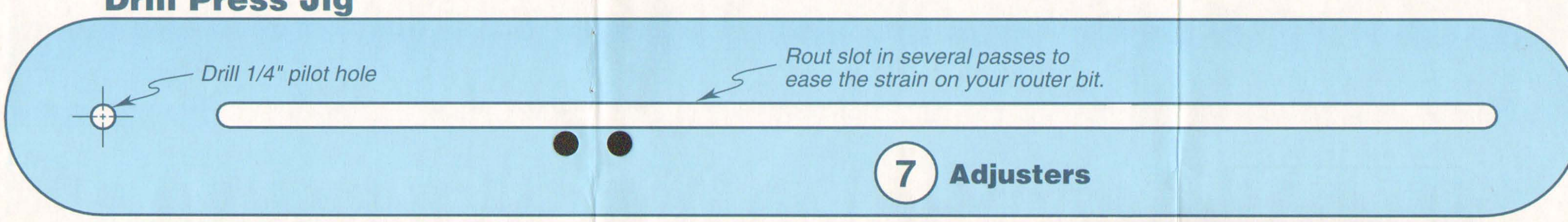
Arts & Crafts Hutch



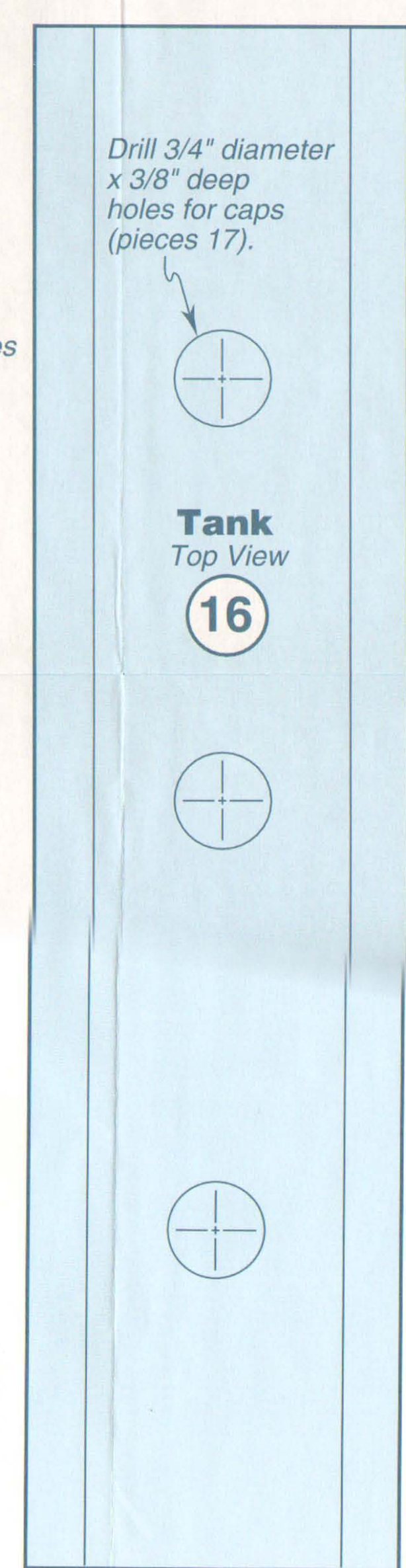
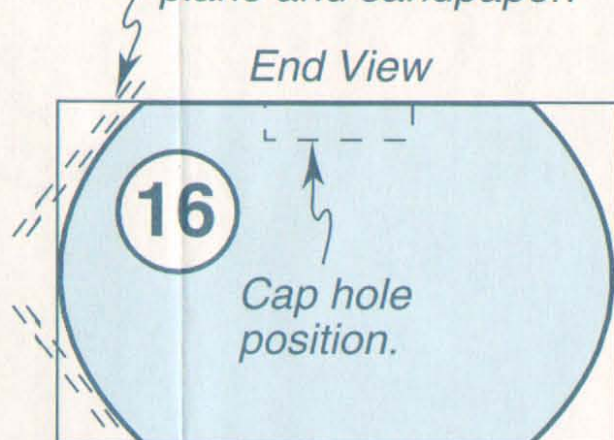
Jewelry Box



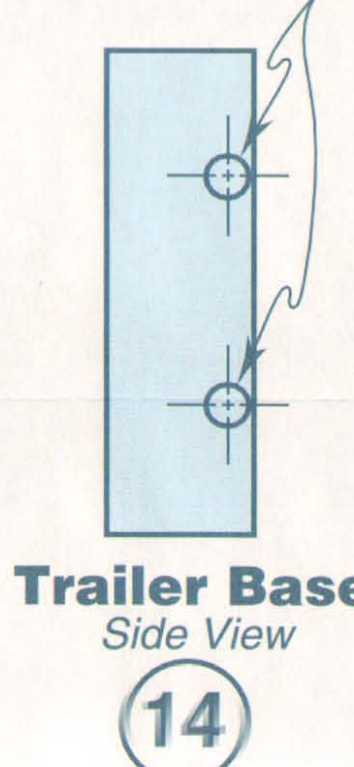
Drill Press Jig



Chamfer block to remove the bulk of the waste, then shape block with a hand plane and sandpaper.

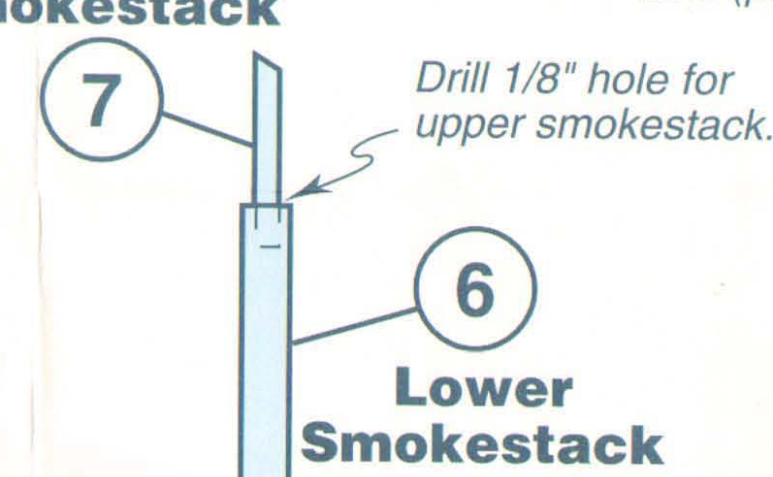


Drill 7/32" diameter holes for axles (pieces 5).

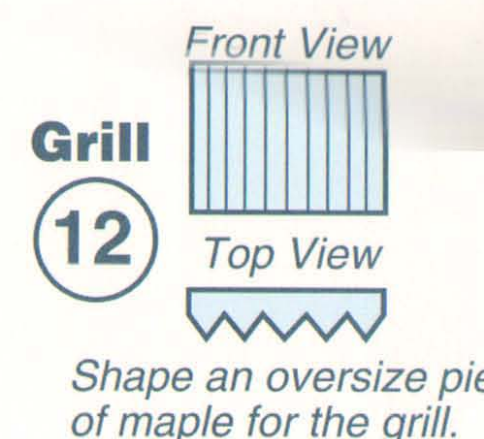


After the sides are assembled, cut the bottom rail and the ends of the stiles to shape with a saber saw.

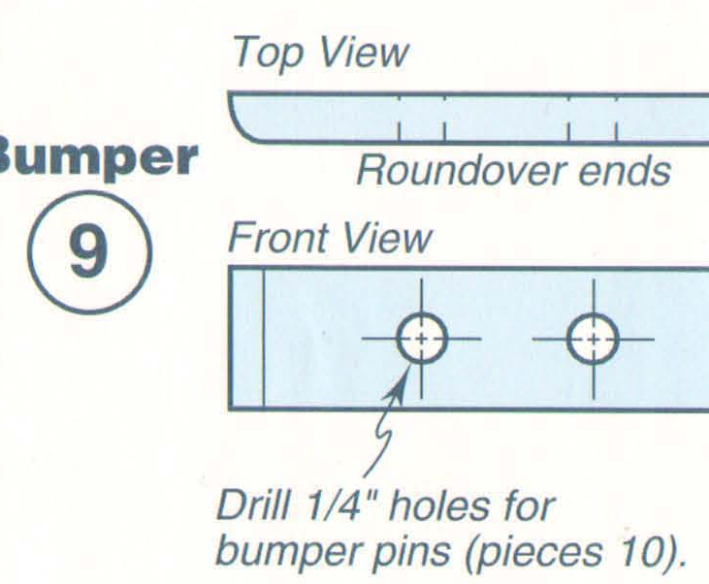
Upper Smokestack



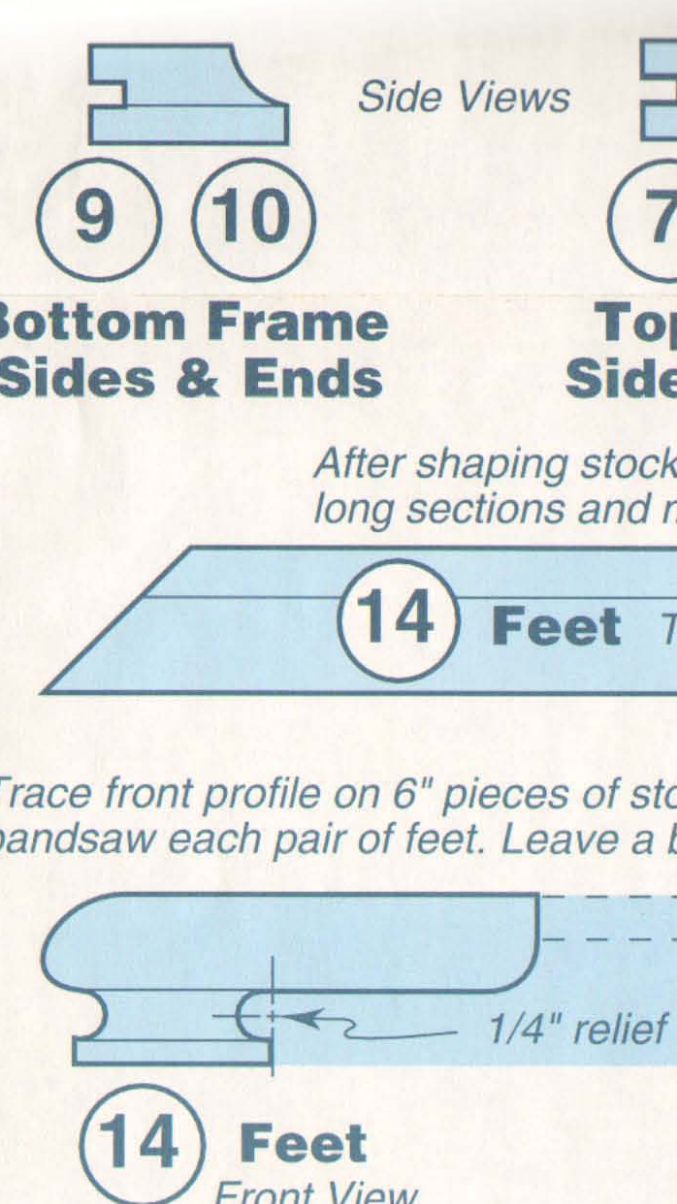
Running Lights



Bumper



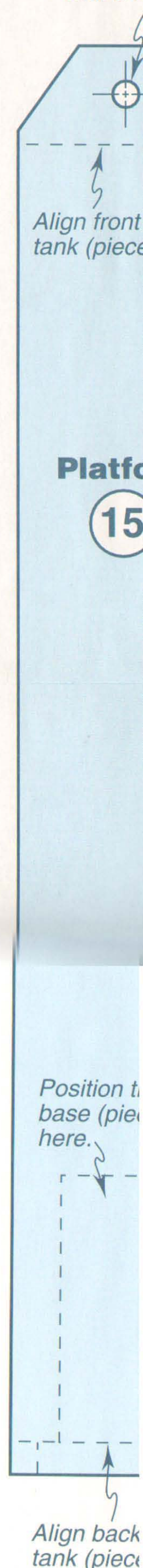
Bottom Frame Sides & Ends



Remove waste with table saw. Shape stock for the then rip the moulding.

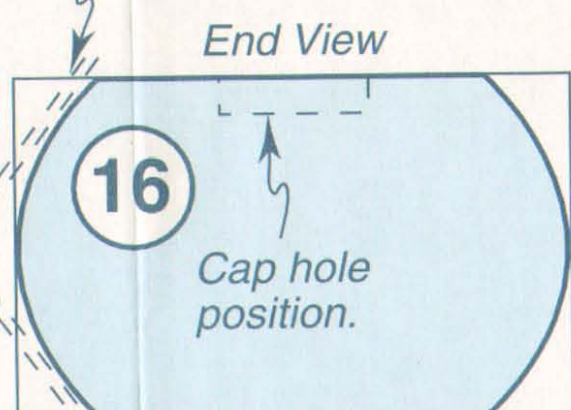
Tod

Drill a 1/8" hole in the hitch to enlarge with a r...



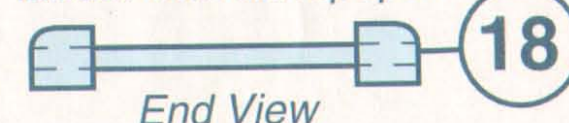
Chamfer block to remove the bulk of the waste, then shape block with a hand plane and sandpaper.

Toddler's Tanker

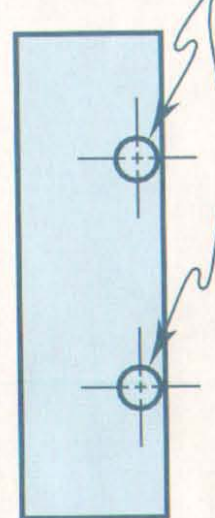


Drill a 1/4" hole for the hitch (piece 8), then enlarge the hole a little with a rattail file.

Roundover top outside edges of catwalk and ladder with sandpaper.



Drill 7/32" diameter holes for axles (pieces 5).



Drill 3/4" diameter x 3/8" deep holes for caps (pieces 17).

Tank
Top View
16

Align front end of tank (piece 16).

Platform
15

Position trailer base (piece 14) here.

Align back end of tank (piece 16).



Cut 1/4" off assembly prior to mitering the back end.

Standard
Side View
18

Miter catwalk and ladder to length to fit on tank.

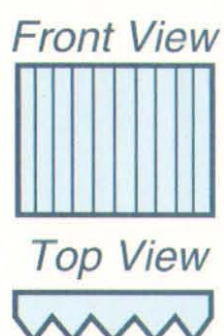
Upper Smokestack
7

Drill 1/8" hole for upper smokestack.

Lower Smokestack
6

Running Lights
13

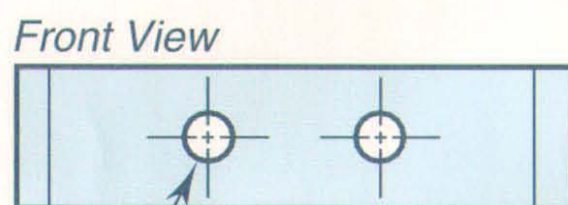
Grill
12



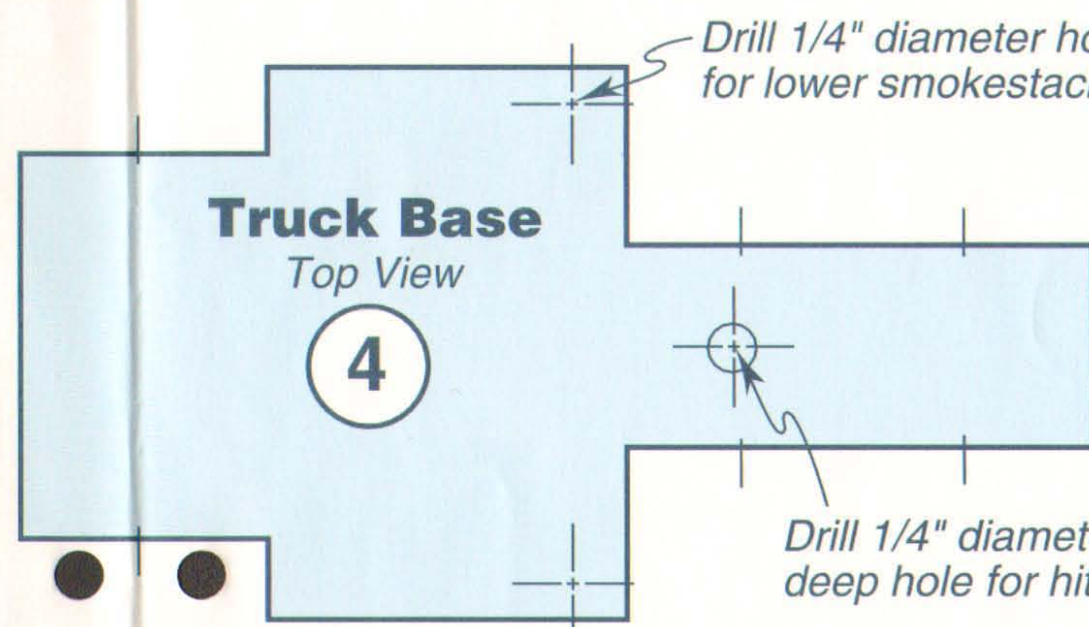
Shape an oversize piece of maple for the grill.

Top View
Roundover ends

Bumper
9



Drill 1/4" holes for bumper pins (pieces 10).



Drill 1/4" diameter holes for lower smokestacks (pieces 6).

Drill 1/4" diameter x 3/8" deep hole for hitch (piece 8).

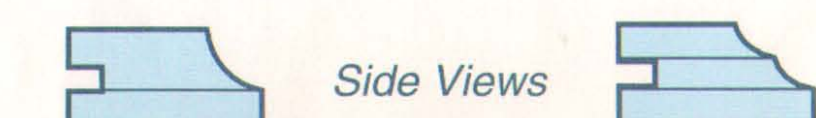
Truck Base
Side View
4

Drill 7/32" diameter holes for axles (pieces 5).

Jewelry Box

Tray Bottom
20

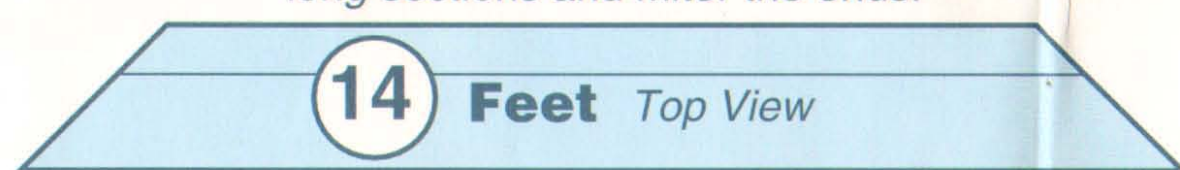
1/4" thick cherry plywood.



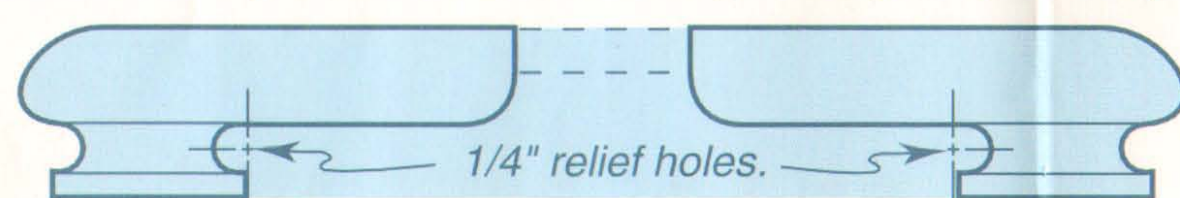
Bottom Frame
Sides & Ends
9 10

Top Frame
Sides & Ends
7 8

After shaping stock for feet, cut 6" long sections and miter the ends.

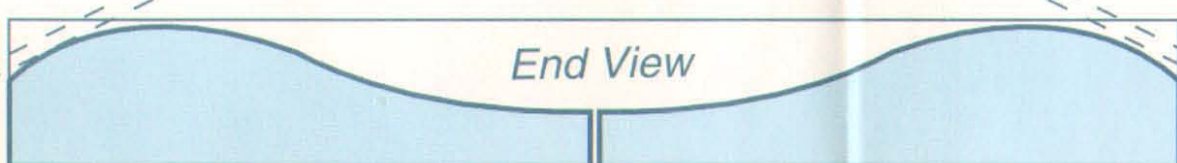


Trace front profile on 6" pieces of stock, drill 1/4" relief holes and bandsaw each pair of feet. Leave a bridge until glue-up is completed.



End View

Front, Back and Sides
1 2



Remove waste with table saw.

Shape stock for the jewelry box with your table saw, then rip the moulding in half for the walls.

Route slot in several passes to ease the strain on your router bit.

7 Adjusters

Full-Size Patterns

- Open staples carefully, remove pattern and fold staples back in place.
- Use graphite paper (available at most art supply stores) or cut and trace the pattern onto your stock.



The Stickley Hutch
Includes patterns for the bottom, side rails and the front apron.



A Toddler's Tanker
Includes the cab, front base, running lights, bumper, grill, smokestacks, platform, tanker and the catwalk/ladder assembly.

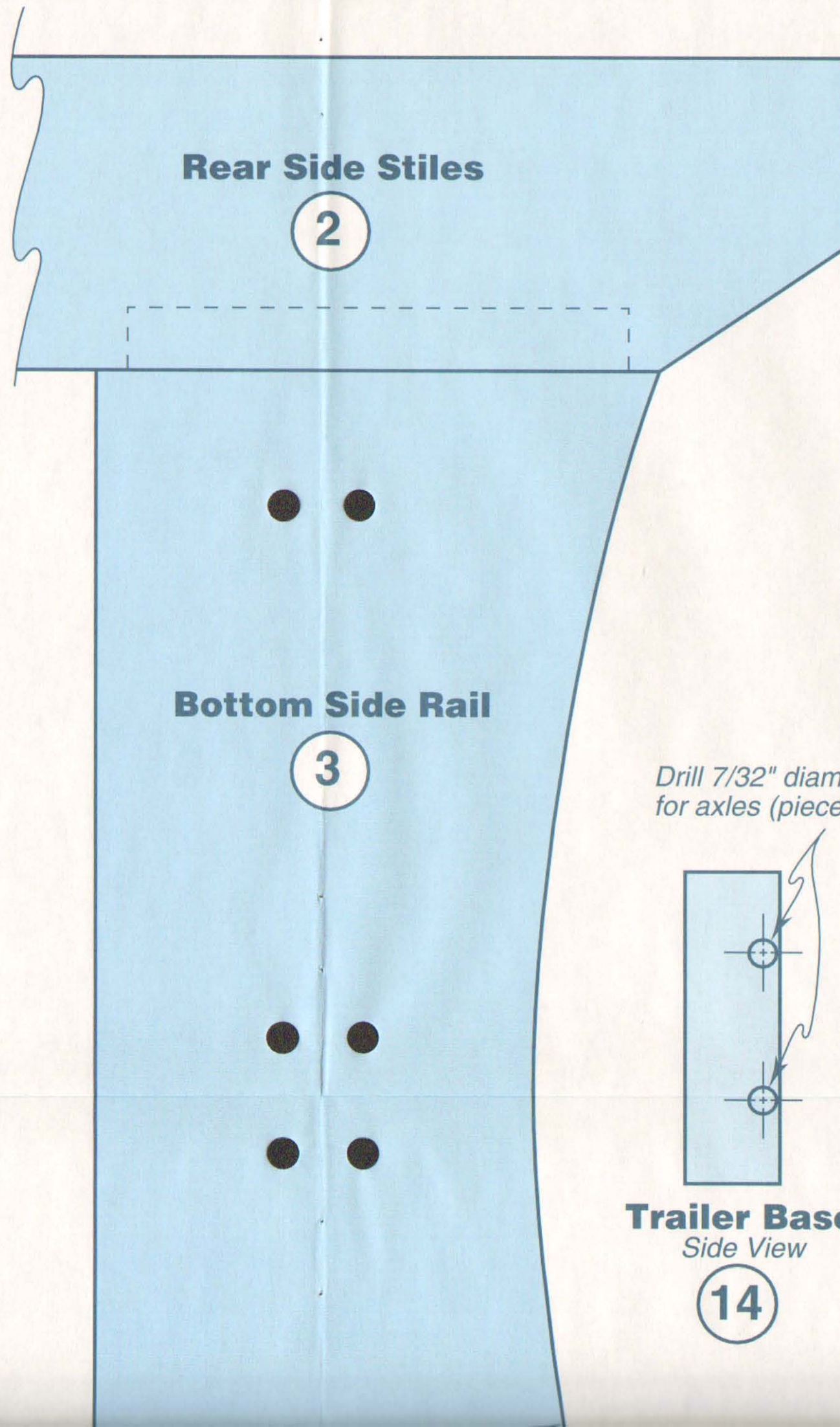
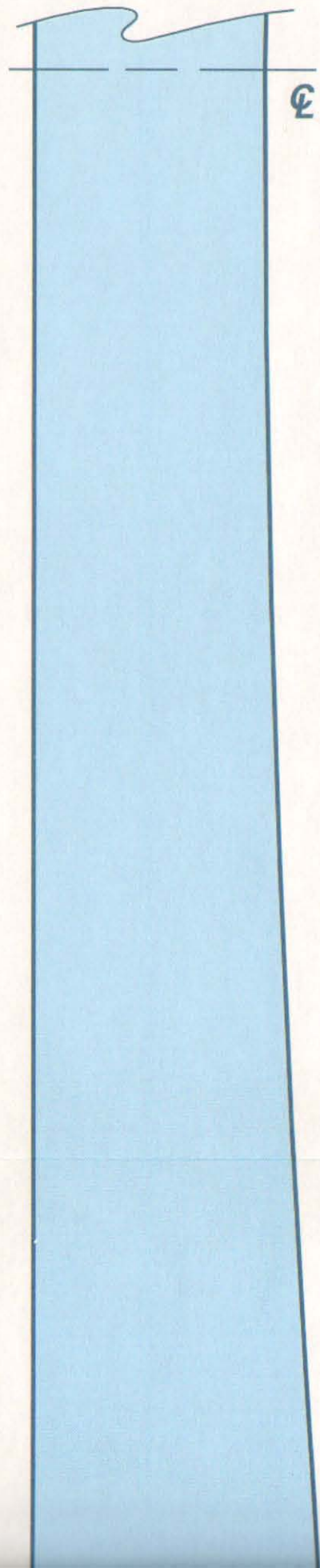


The Jewelry Box
You'll find patterns for the jewelry box walls, feet, tray front and tray bottom.

Drill Press Tilt Table Jig
The adjuster pattern.

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Rear Side Stiles

2

Bottom Side Rail

3

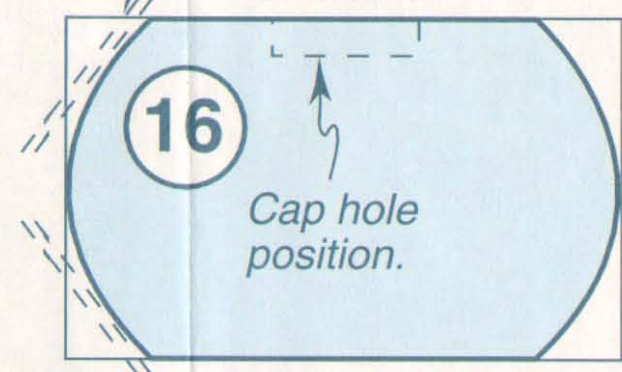
Drill 7/32" diameter holes for axles (pieces 5).

Trailer Base
Side View

14

Chamfer block to remove the bulk of the waste, then shape block with a hand plane and sandpaper.

End View



16

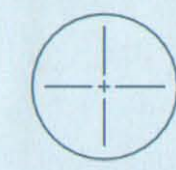
Cap hole position.

Drill 3/4" diameter x 3/8" deep holes for caps (pieces 17).



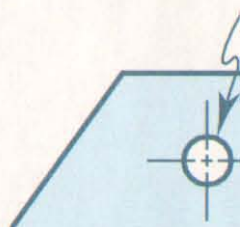
Tank
Top View

16



Tod

Drill a 1/2" hole in the hitch to enlarge with a reamer.



Align front tank (piece 16) to hitch.

Platform

15

Trailer Base

Side View

14

After the sides are assembled, cut the bottom rail and the ends of the stiles to shape with a saber saw.

Front Side Stiles

1

Arts & Crafts Hutch

Cab

1

Top View

Bandsaw the apron to shape after forming tenons at both ends.

Upper Smokestack

7

Drill 1/8" hole for upper smokestack.

Lower Smokestack

6

Running Lights

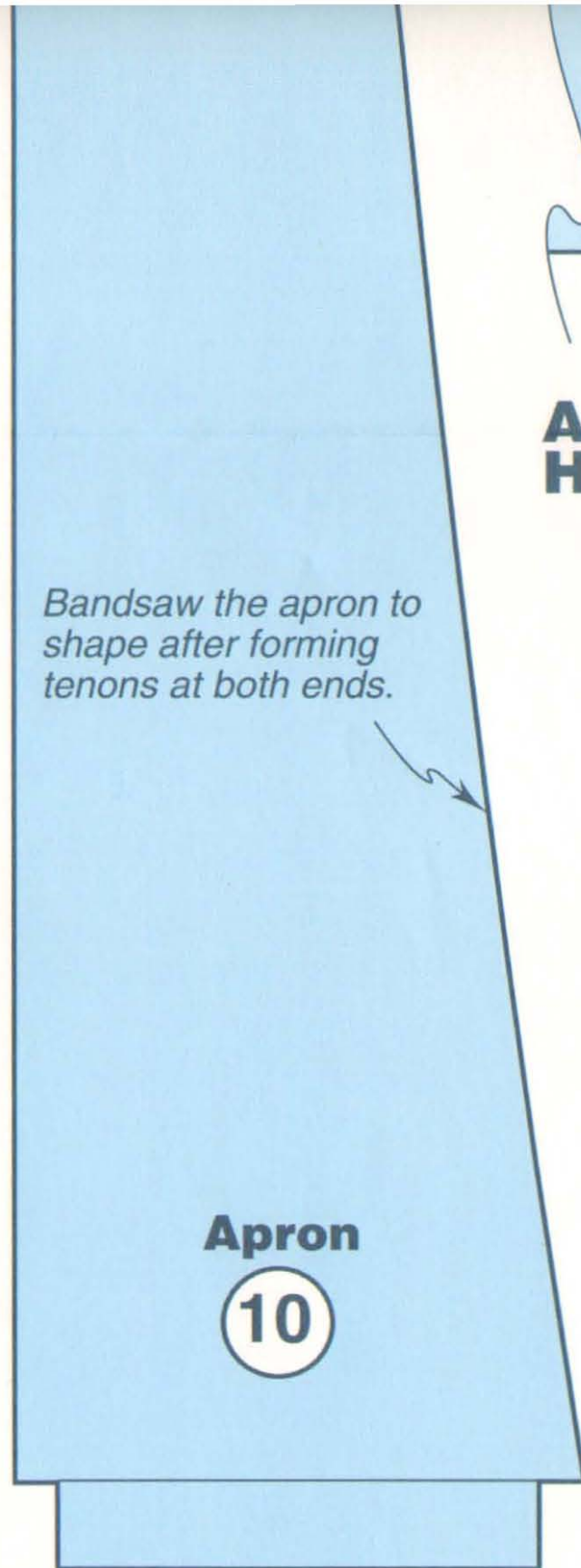
13

Position the base (piece) here.

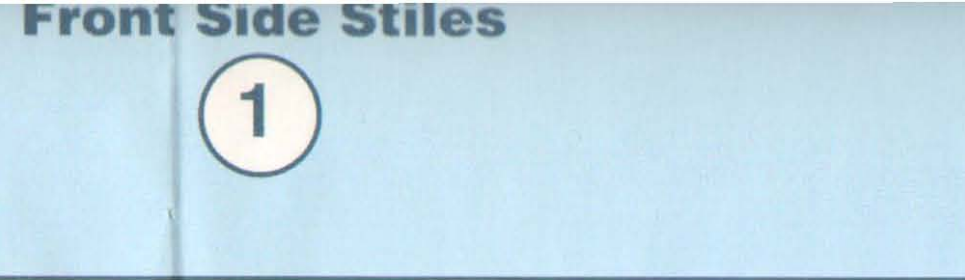
Align back tank (piece) here.

Front View

Grill



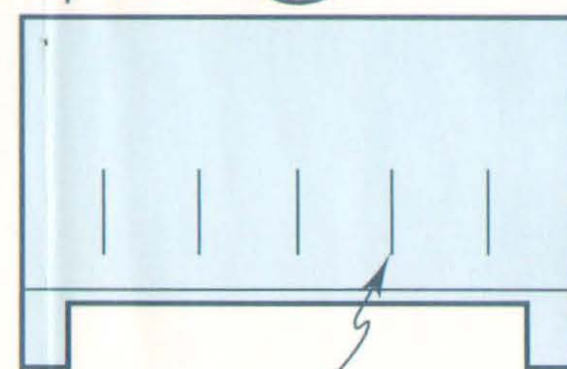
Arts & Crafts Hutch



Cab

1

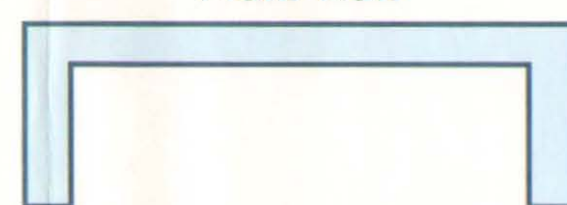
Top View



Center running lights (pieces 13) on marks.



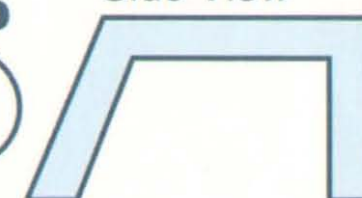
Front View



Cab

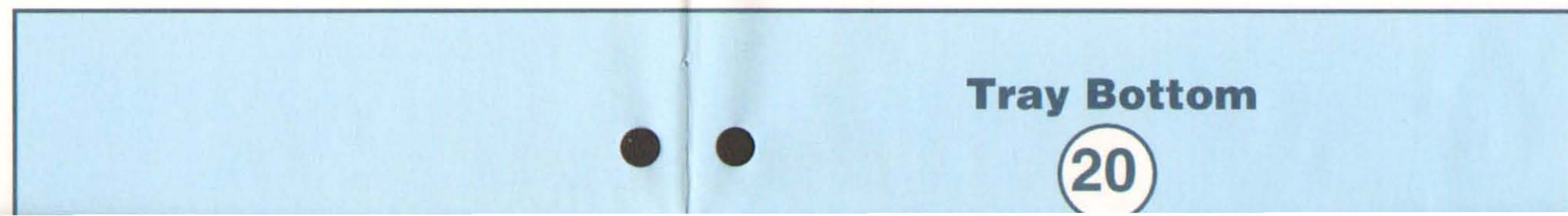
1

Side View



Follow the sequence described on page 21 for shaping the cab.

Jewelry Box



Upper Smokestack

7

Drill 1/8" hole for upper smokestack.

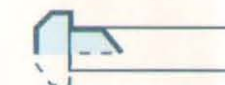


6

Lower Smokestack

Running Lights

13



Grill

12

Front View



Top View



Shape an oversize piece of maple for the grill.

Top View

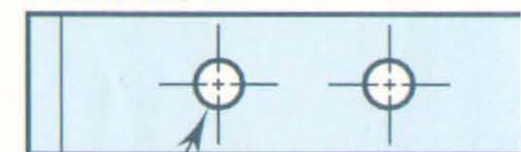


Roundover ends

Bumper

9

Front View



Drill 1/4" holes for bumper pins (pieces 10).



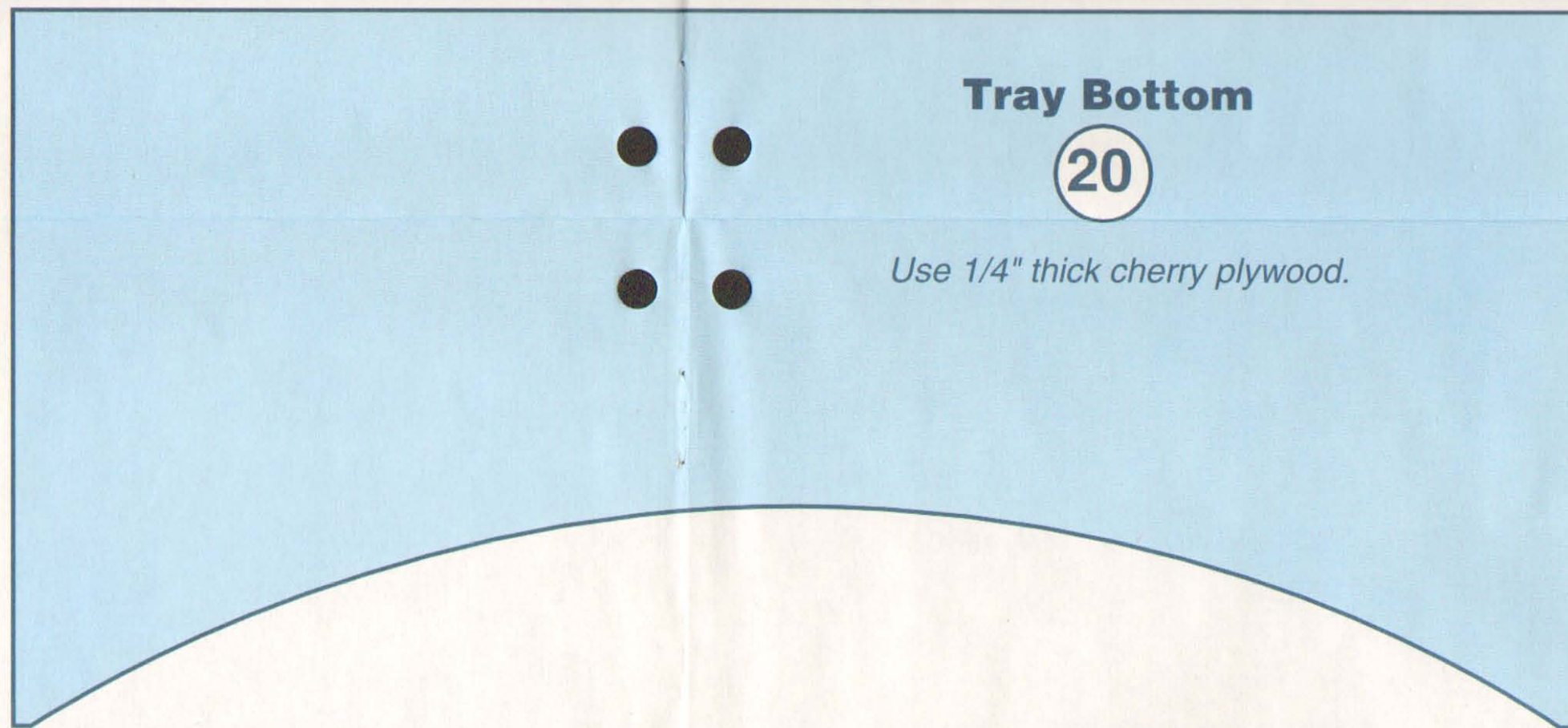
9

10

Side Views

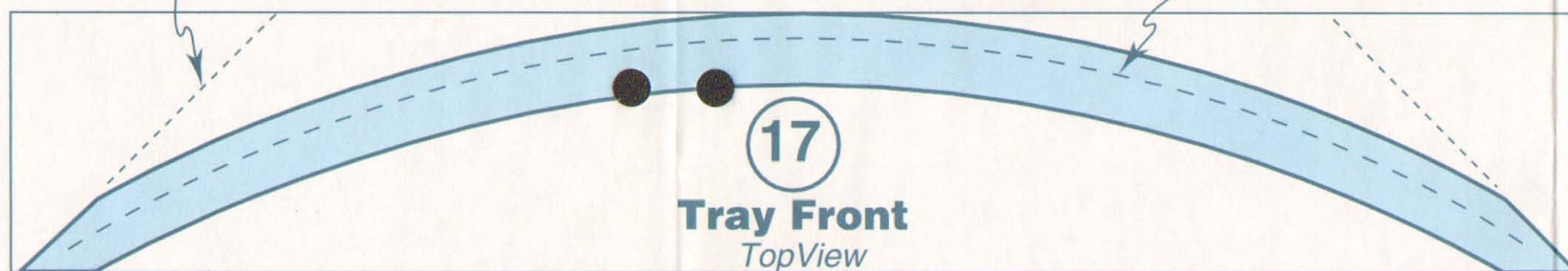


7

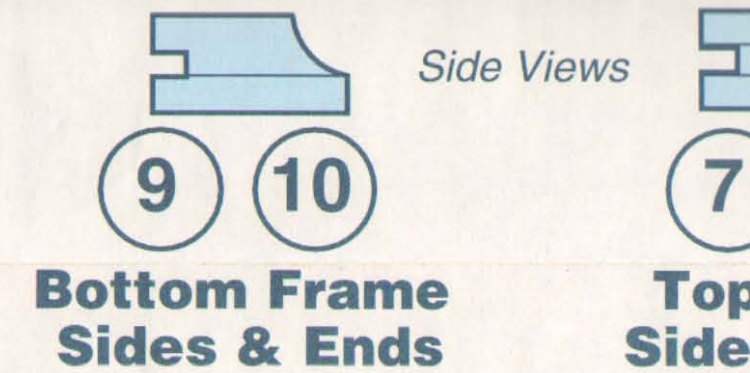


Miter block to length
before cutting front to shape.

Rout a 1/4" wide x 1/4" deep groove for the bottom
(piece 20) using a slot cutting router bit.



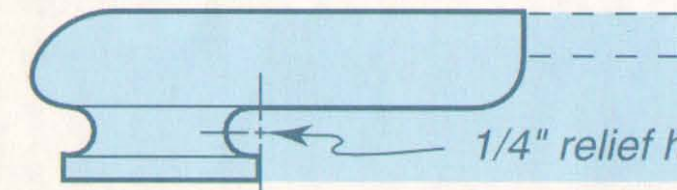
Bandsaw front from thick stock.



After shaping stock
long sections and m



Trace front profile on 6" pieces of stock
bandsaw each pair of feet. Leave a b



(14) Feet
Front View

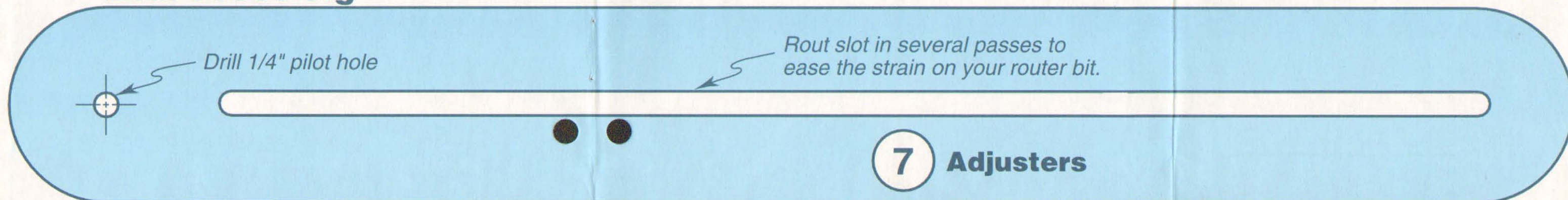
Front,



Remove waste
with table saw.

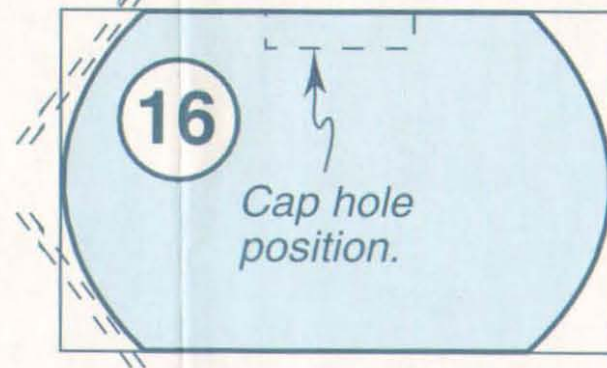
Shape stock for the
then rip the mouldin

Drill Press Jig



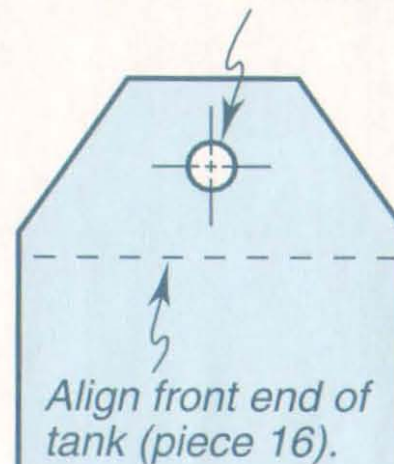
Chamfer block to remove the bulk of the waste, then shape block with a hand plane and sandpaper.

End View



Toddler's Tanker

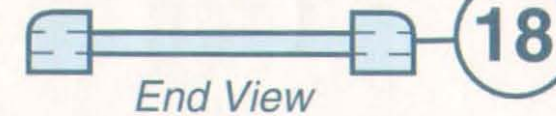
Drill a 1/4" hole for the hitch (piece 8), then enlarge the hole a little with a rattail file.



Platform

15

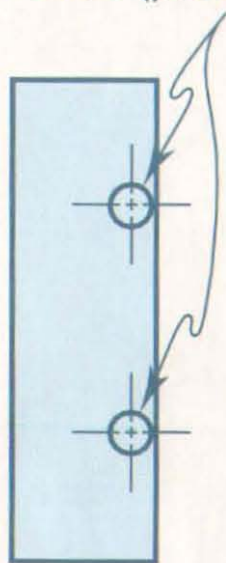
Roundover top outside edges of catwalk and ladder with sandpaper.



End View

18

Drill 7/32" diameter holes for axles (pieces 5).



Trailer Base
Side View

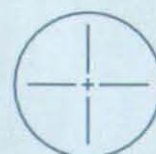
14

Drill 3/4" diameter x 3/8" deep holes for caps (pieces 17).



Tank
Top View

16



Rungs

19

Cut 1/4" off assembly prior to mitering the back end.



Standard
Side View

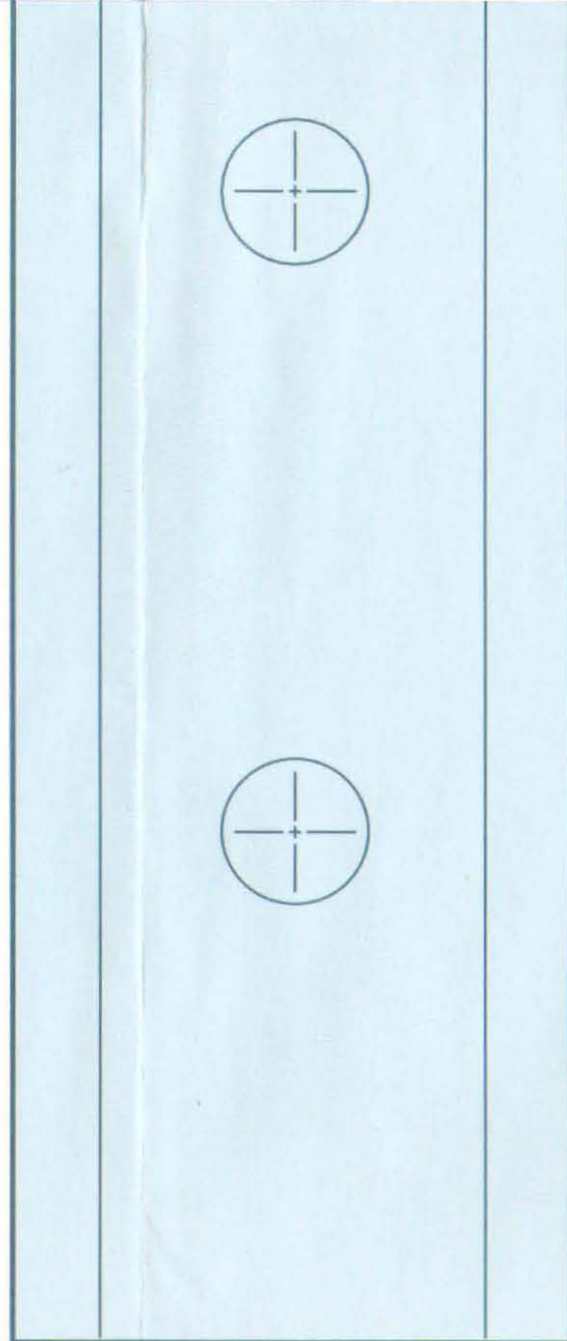
18

18

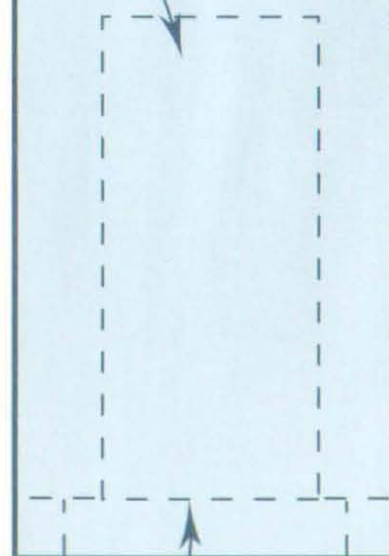
Standard

Trailer Base
Side View

14



Position trailer
base (piece 14)
here.



Align back end of
tank (piece 16).

**Upper
Smokestack**

7

Drill 1/8" hole for
upper smokestack.



6

**Lower
Smokestack**

**Running
Lights**

13

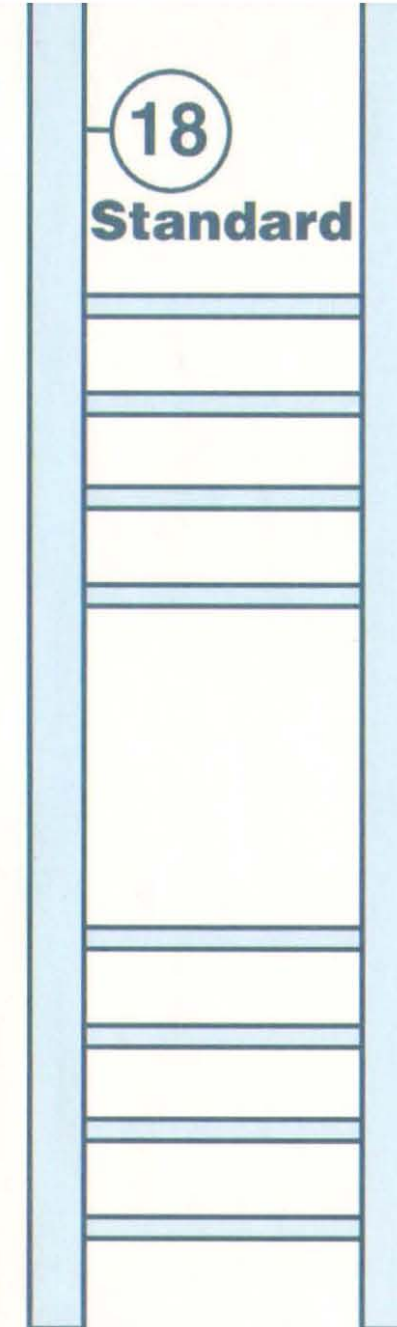
Front View



Standard
Side View

18

18
Standard



Miter catwalk and ladder
to length to fit on tank.



Drill 1/4" diameter holes
for lower smokestacks (pieces 6).



**Running
Lights**

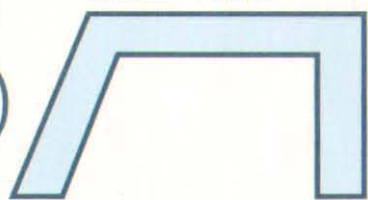
13



Cab

1

Side View



described
the cab.

Jewelry Box

Tray Bottom

20

4" thick cherry plywood.

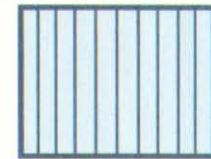


6
**Lower
Smokestack**

Grill

12

Front View



Top View



*Shape an oversize piece
of maple for the grill.*

Top View

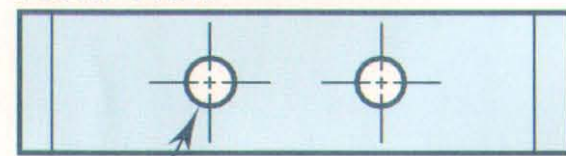


Roundover ends

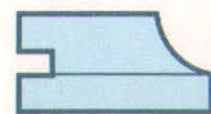
Bumper

9

Front View



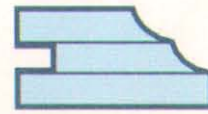
*Drill 1/4" holes for
bumper pins (pieces 10).*



9 **10**

**Bottom Frame
Sides & Ends**

Side Views



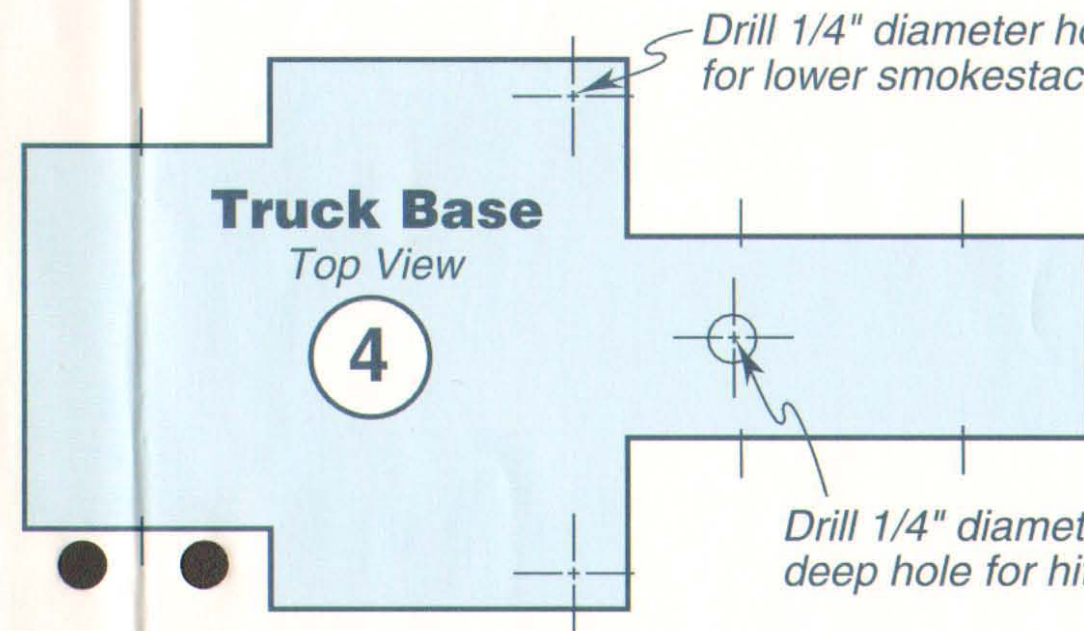
7 **8**

**Top Frame
Sides & Ends**

*After shaping stock for feet, cut 6"
long sections and miter the ends.*



14 **Feet** *Top View*



Truck Base

Top View

4

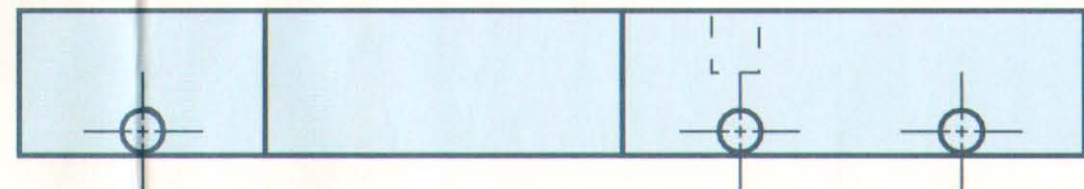
*Drill 1/4" diameter holes
for lower smokestacks (pieces 6).*

*Drill 1/4" diameter x 3/8"
deep hole for hitch (piece 8).*

4

Truck Base

Side View



Drill 7/32" diameter holes for axles (pieces 5).

Full-Size Patterns

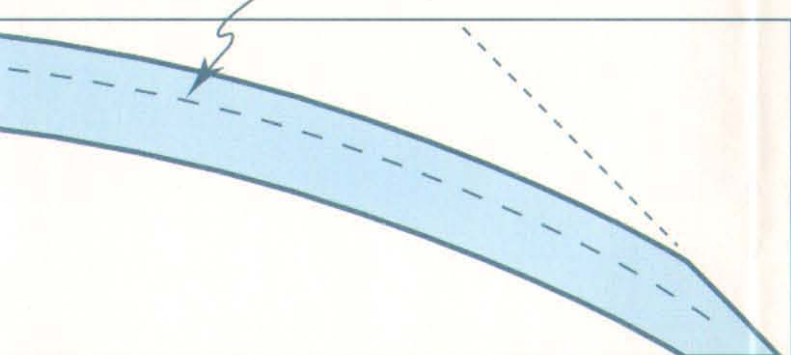
- Open staples carefully, remove pattern and fold staples back in place.
- Use graphite paper (available at most art supply stores) or cut and trace the pattern onto your stock.

Jewelry Box

20

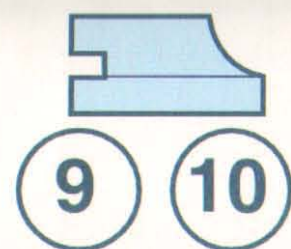
1/4" thick cherry plywood.

1/4" wide x 1/4" deep groove for the bottom (20) using a slot cutting router bit.

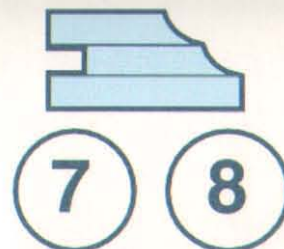


Route slot in several passes to ease the strain on your router bit.

7 Adjusters



**Bottom Frame
Sides & Ends**



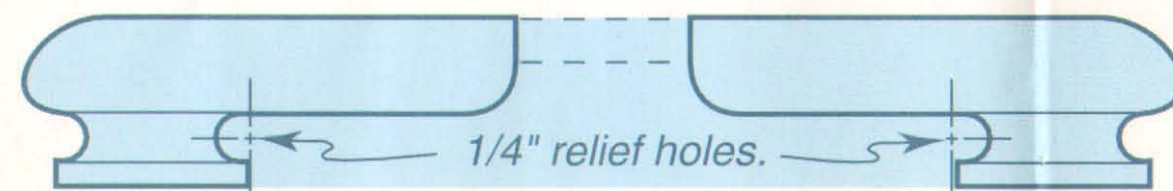
**Top Frame
Sides & Ends**

After shaping stock for feet, cut 6" long sections and miter the ends.



14 Feet Top View

Trace front profile on 6" pieces of stock, drill 1/4" relief holes and bandsaw each pair of feet. Leave a bridge until glue-up is completed.



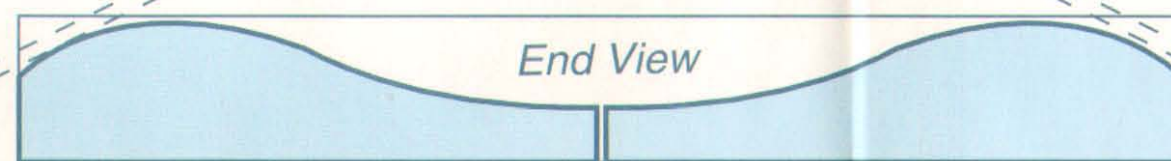
14 Feet
Front View



End View

1 2

Front, Back and Sides



End View

Remove waste with table saw.

Shape stock for the jewelry box with your table saw, then rip the moulding in half for the walls.

Full-Size Patterns

- Open staples carefully, remove pattern and fold staples back in place.
- Use graphite paper (available at most art supply stores) or cut and trace the pattern onto your stock.



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The adjuster pattern.

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