

Built-to-last Workcenter

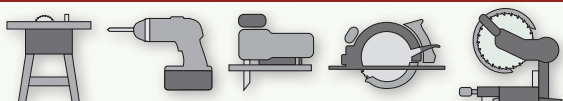
Inexpensive and simple to construct, these shop essentials will provide years of service.



BASIC-BUILT

GREAT PROJECTS MADE SIMPLE.

TOOLS NEEDED

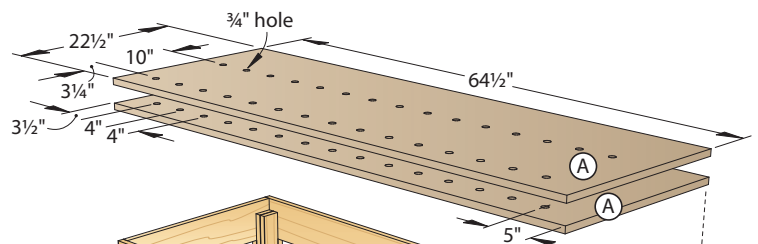


Overall dimensions:
Workbench: 66"W x 24"D x 34½"H
Wall storage unit: 72"W x 9"D x 83¾"H
Approximate materials cost:
Workbench \$100; Wall storage unit \$50

EASY VISELIKE WORKHOLDING WITH A COMMON CLAMP



Clamp a board in place against a bench dog (Shop Tip, page 28) for easy face-planing, chiseling, or sanding. See page 27 for details on the clamping blocks, mounted beneath the benchtop.



1 BENCHTOP EXPLODED VIEW

Two easy-to-build components—a sturdy workbench and a versatile tool-storage wall complete with custom tool racks—will make your workspace the envy of your friends. The durable MDF benchtop provides a solid, stable work surface, and an ingenious set of blocks behind the rails turns an ordinary one-hand clamp into a vise, as shown right.

Laminate the bench's top

1 Cut the tops (A) from $\frac{3}{4}$ " MDF, making them 1" longer and wider than specified in **Drawing 1**. From $\frac{3}{4}$ " pine, cut sixteen $2\frac{1}{4}\times 34$ " blanks. These will later become the leg components (B, C, D, E), but will first be used as clamping cauls to laminate the top.

2 Place one of the tops (A) on sawhorses and use a glue spreader (a cardboard scrap or an old credit card) to evenly distribute glue over its surface. Set the other top panel onto the first, clamp the panels together [**Photo A**], and allow to dry. Move quickly during this step so the glue doesn't set up before you get the assembly clamped.

3 Use a circular saw and straightedge to trim one edge of the laminated top straight and smooth [**Photo B**]; then, use the same setup to rip the top to final width. Next, trim one end square to the edge, and then cut the top to final length.

Build the legs and rails

1 From the pine blanks used earlier, cut each of the leg components (B–E) to length [**Drawing 2, Materials List**] on the miter saw. Also, cut a spacer at least 4" long from a 5"-wide scrap piece.

2 Begin assembling a leg by covering the top (A) with kraft paper; this keeps glue-ups from sticking to the top. Next, stand an inner leg face (E) on edge on the paper. Glue and clamp an upper leg core (C) and lower leg core (D) to the inner leg with a spacer between them to create the mortise that will hold the end rails [**Photo C**]. Remove the spacer when the leg has been securely clamped, and wipe away any glue squeeze-out with a damp rag. After about 30 minutes, the glue-up can be removed from the clamps and set aside. Repeat the process for the remaining legs.

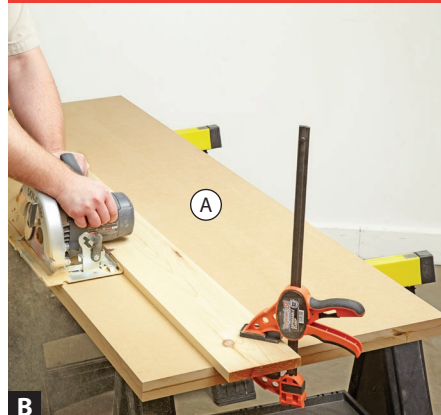
3 When all leg assemblies (C/D/E) have dried, glue and clamp the outside leg faces (B) to them, again using the

LEG BLANKS DOUBLE AS CAULS



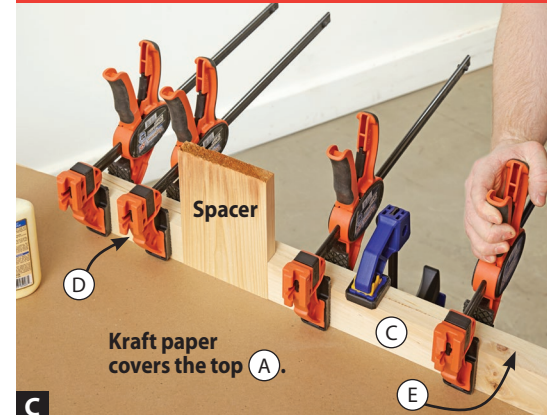
Distribute clamping force evenly across the tops (A) by clamping pairs of leg blanks side by side and spaced evenly along the MDF panels.

CUT THE TOP TO ITS FINAL WIDTH



A straight board guides your circular saw when trimming the top (A) to width. Clamp the board firmly to the top to prevent it from slipping.

USE THE TOP AS AN ASSEMBLY TABLE



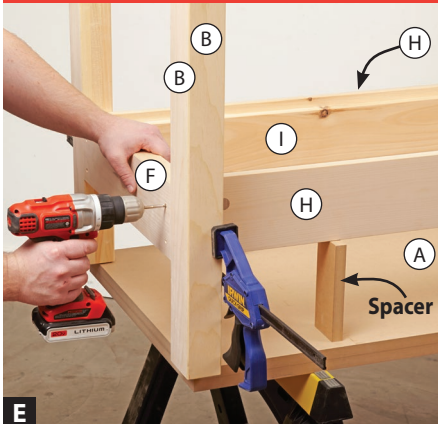
Assembling the leg pieces (C, D, E) on edge keeps one edge aligned. Clamp the parts to the top (A) and to each other.

CHAMFER THE DOWELS



D To make the dowels easier to insert, use sandpaper to slightly chamfer their edges before inserting them into the holes in the stretchers (H/I).

PILOT HOLES PREVENT SPLITTING



E When drilling the pilot holes, extend a $\frac{3}{16}$ " drill bit as far as possible from the drill chuck while still maintaining a solid grip.

SCRIBING ENSURES ACCURACY



F By allowing 1" extra in length at each end of the upper front/back aprons (K), you can set them in position and scribe their final dimensions.

top (A) to keep edges and faces aligned. Be sure to make two mirrored pairs [Drawing 2].

4 Cut the outer and inner end rails (F, G) to size [Drawing 2]; then, glue the rails together to make two assemblies.

5 Cut the outer and inner stretchers (H, I) to width, but 2" longer than specified [Drawing 3]. Glue and clamp these parts together with the bottom edges flush, wiping away any glue squeeze-out. Cut these stretchers to finished length when dry. Discard the kraft paper.

6 Use a $\frac{3}{4}$ " spade bit to drill two holes where shown in each end of the stretchers (H/I) [Drawing 3]. Cut a $\frac{3}{4}$ "-diameter hardwood dowel into eight $1\frac{1}{2}$ " lengths and chamfer one end of each [Photo D]. Apply glue in the holes and insert the dowels, tapping them flush with a mallet.

Bring the bench together

1 Glue and clamp one end-rail assembly (F/G) into the mortises of two leg assemblies (B-E) [Drawing 2]. Repeat for the other end.

2 Use $6\frac{1}{2}$ "-long spacer blocks to position the stretchers (H/I) against the leg assemblies (B-G) and flush with the top edge of the end rails (F/G) [Photo E]; clamp the stretchers in place. Transfer the locations of the dowels installed in the stretchers (H/I) onto the end rails. Drill $\frac{3}{16}$ " pilot holes through the end rails, centered on the dowels. The cross grain of the dowels gives the screws better purchase than the end grain of the stretchers. Next, drive $4\frac{1}{2}$ " structural wood screws [Source] through the pilot holes to secure the base assembly together.

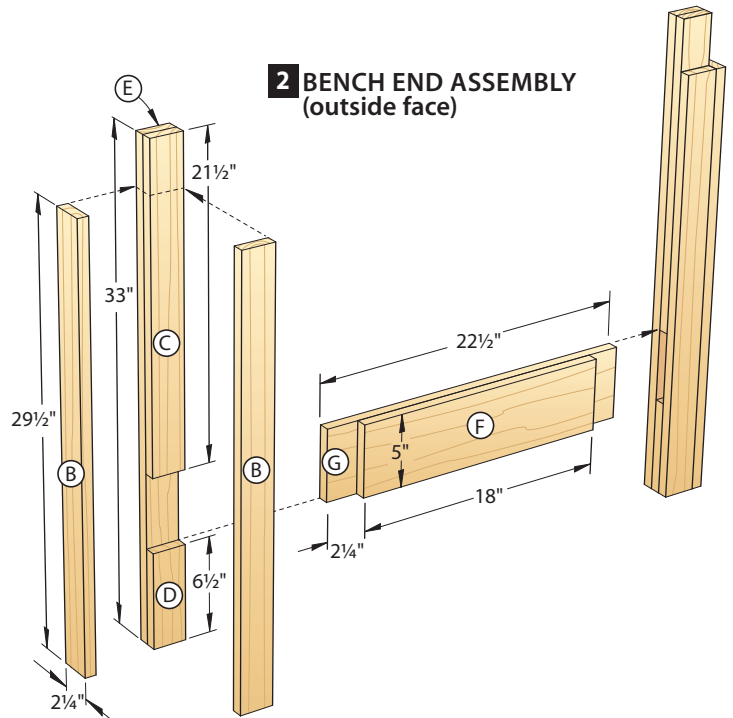
3 Cut the end aprons (J) to size, and glue them to the ends of the top (A) flush with the top face. After the glue dries, set the top assembly (A/J) on the base.

4 Cut the front/back aprons (K) to final width but 2" longer than shown [Drawing 3]. Rest them in place on the base, scribe the ends [Photo F], and cut the front/back aprons to final length. Glue the aprons to the top, and glue and screw the aprons (J, K) to each other and the base.

5 Lay out the dog-hole locations on the top (A) [Drawing 1], and use a $\frac{3}{4}$ " spade or Forstner bit to drill the holes.

Quick Tip: Use two squares as visual guides to keep the drill perpendicular as you drill [Photo G]. Mark the $\frac{7}{8}$ " hole locations on one end apron (J) and the front apron (K) [Drawing 3] and drill them with a spade bit.

2 BENCH END ASSEMBLY (outside face)



Add the clamp blocks

1 From $\frac{3}{4}$ "-thick hard maple, cut one $2\frac{3}{16}\times 14$ " blank for the front clamp blocks (L) and a $1\frac{5}{8}\times 10$ " blank for the end clamp blocks (M). **Note:** Avoid using pine here because the slots you cut for the clamps will wear out in softer woods.

Rip a $\frac{1}{4}$ " centered groove 1" deep along one edge of both blanks [Drawing 4].

2 Lay out three front clamp blocks (L) on the wider blank and two end clamp blocks (M) on the narrow one [Drawing 4]. Mark the location of the $\frac{1}{4}$ " dado on each of the five blocks. Clamp an auxiliary fence to your table saw's miter gauge, line up a dado layout line with the blade, and crosscut the dados with two or three passes. Repeat for each clamp block.

3 Cut the taper on each clamp block (L, M) with a jigsaw. Then, crosscut the clamp blocks to final length.

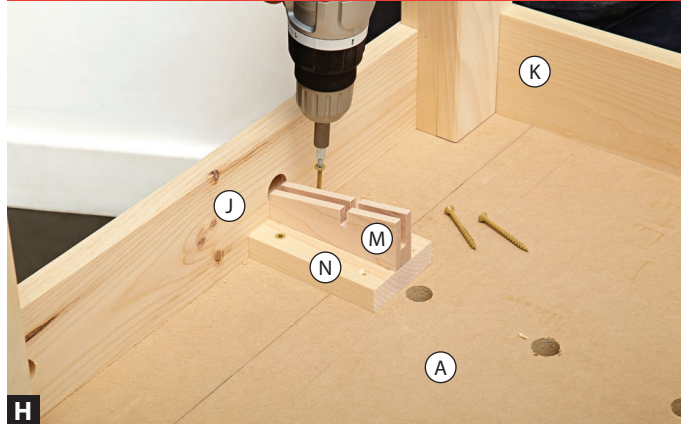
4 Cut the clamp block mounting cleats (N) to size [Drawing 4] and glue and screw them to the clamp blocks (L, M).

BORE STRAIGHT BENCH-DOG HOLES



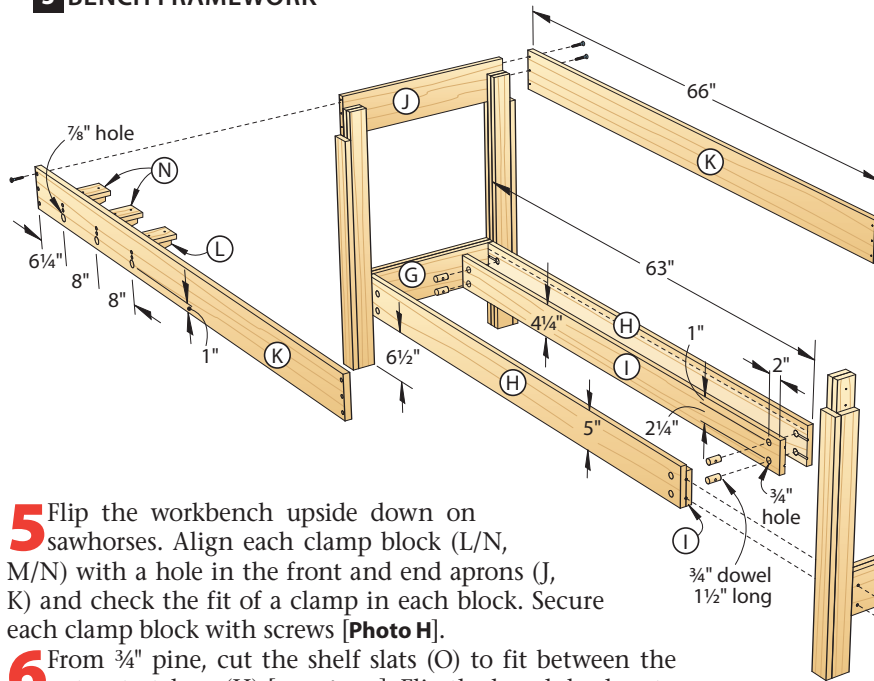
G To drill perpendicular bench-dog holes in the top (A), have a helper assist you in keeping the drill aligned with one square while you watch the other.

INSTALL CLAMP BLOCKS



H Center a clamp block (M/N) to a hole in the upper end apron (J), then attach the block to the underside of the benchtop (A).

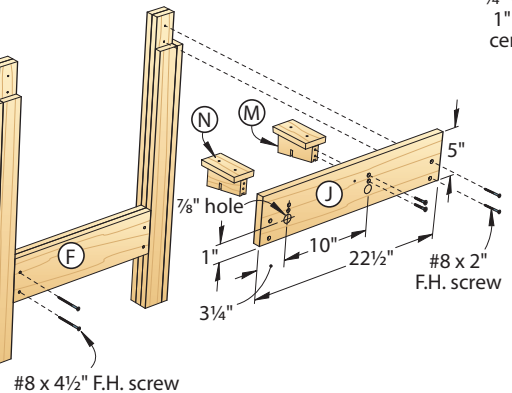
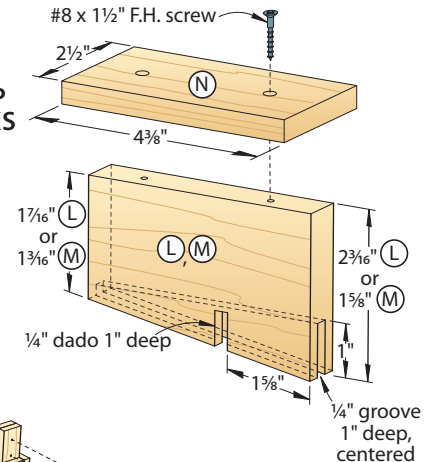
3 BENCH FRAMEWORK



5 Flip the workbench upside down on sawhorses. Align each clamp block (L/N, M/N) with a hole in the front and end aprons (J, K) and check the fit of a clamp in each block. Secure each clamp block with screws [Photo H].

6 From $\frac{3}{4}$ " pine, cut the shelf slats (O) to fit between the outer stretchers (H) [Drawing 1]. Flip the bench back onto its legs; then glue the slats to the inner stretchers (I).

4 CLAMP BLOCKS

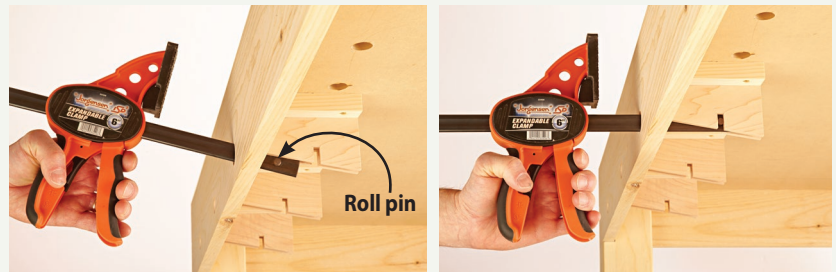


SHOP TIP

Turn a bar clamp into a vise

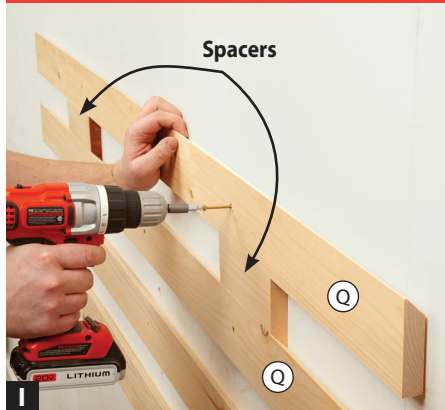
Instead of a pricey vise, this bench uses shop-made clamp blocks that hold typical one-hand ratcheting bar clamps inserted through holes in the bench's front and end aprons, *right*. After removing the fixed jaw, the bar fits into the groove of the clamp block, and the bar's roll pin holds the clamp in place once inserted, *far right*.

These clamp blocks are designed to work with Irwin SL300 and Jorgensen ISD 3 expandable bar clamps. If you have a different clamp, test its fit in the blocks and make modifications to the grooves as needed, or install a larger roll pin in the clamp bar.



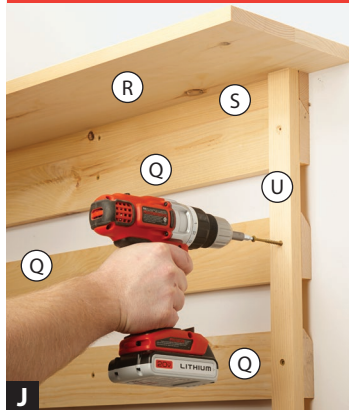
By anchoring a ratcheting bar clamp's roll pin in the clamp block, you can then squeeze a workpiece between the moving jaw and a bench dog.

SPACERS ENSURE PROPER PLACEMENT



Beveled $3/4$ "-wide spacers ripped from scrap cleat material consistently space each subsequent wall cleat (Q) as you screw it to the wall.

ATTACH THE BRACE CLEATS



Drive $\#8 \times 3$ " screws through the brace cleat (U) and the ends of the wall cleats (Q) and into the underlying wall stud.

Now build some tool storage

1 From $3/4$ " pine, cut to size the base wall support (P), wall cleats (Q), shelf (R), shelf cleat (S), shelf braces (T), and brace cleats (U) [Materials List and Drawing 5]. Tilt your tablesaw blade to 45° and rip bevels along the top edge of each wall cleat (Q) and along the bottom edge of the shelf cleat (S).

2 Locate the studs in the wall where you want to attach your wall unit, making sure each end lands on a stud. Then, place the base wall support (P) flush against the floor and screw it to the studs; do not drive screws at the ends yet, as these will be fastened when you install the brace cleats (U).

3 Position the bottom edge of the first wall cleat (Q) 30" off the floor. Check for level; then screw it to the studs. Again, do not drive screws at the ends of the cleats. Then, attach the remaining wall cleats [Photo I].

4 Glue the shelf cleat (S) to the shelf (R) flush with the shelf's rear edge [Drawing 5a]. After the glue dries, hang the shelf assembly on the topmost wall cleat and screw the shelf cleat to the studs.

5 Hold the brace cleats (U) flush with the ends of the wall cleats (Q) and screw through them to the wall studs [Photo J, Drawing 5]. Screw the shelf braces (T) to the brace cleats, and then drive screws through the shelf (R) from above and into the shelf braces.

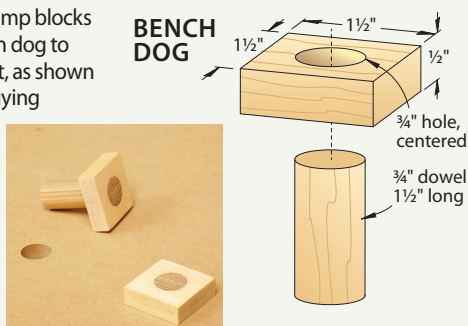
Create custom tool holders

Now that you've built the workbench and wall-hung tool rack, build individual organizers customizable for your tools. Use Drawings 6, 7, and 8 as the basis for constructing these racks, using beveled cleats to hang them from the mating wall cleats. Find more tool racks in the WOOD Patterns® insert on page 42. 🌲

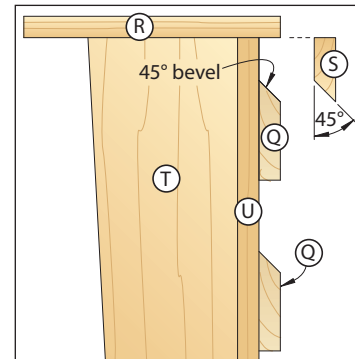
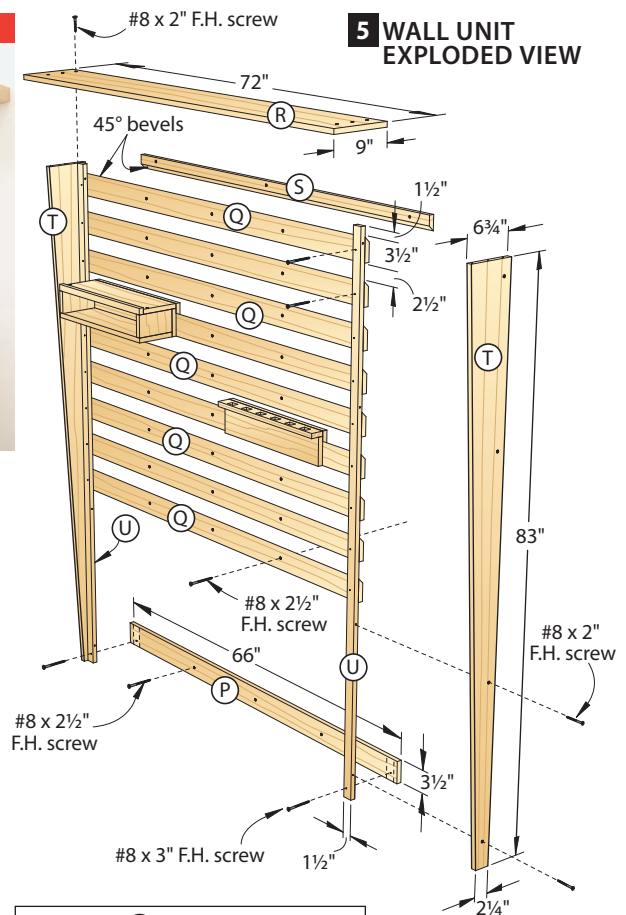
SHOP TIP

To use the clamp in the clamp blocks as a vise, you need a bench dog to trap the workpiece against, as shown on page 27. Rather than buying bench dogs, consider making your own, as shown. If the dowels fit too snugly in the dog holes in the top (A), simply sand them until they slip in and out easily.

BENCH DOG

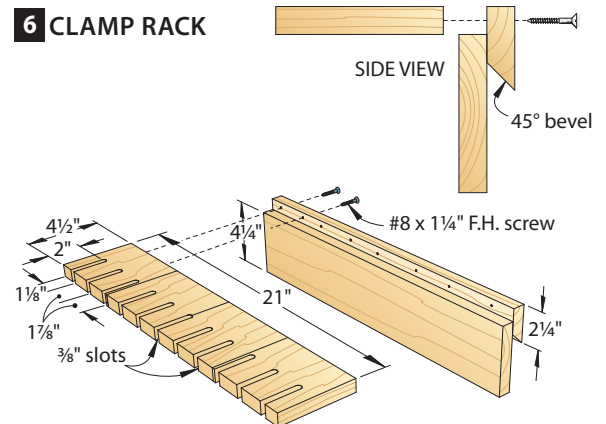


5 WALL UNIT EXPLODED VIEW



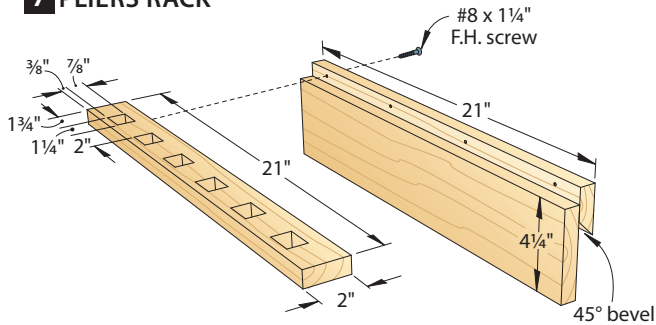
5a SIDE SECTION VIEW

6 CLAMP RACK



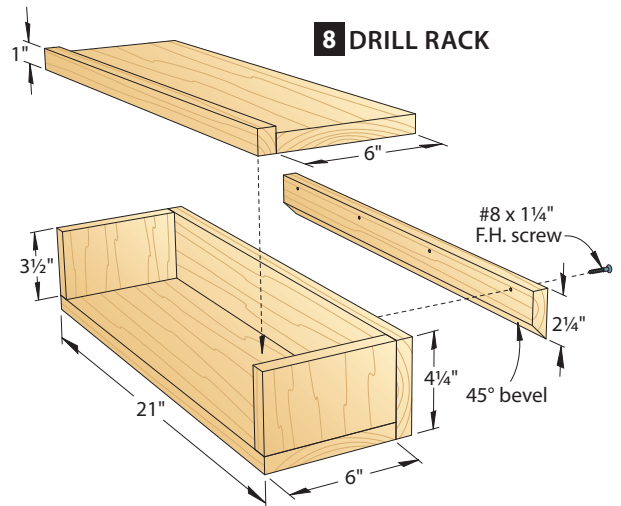
NOTE: If using pine (or any other softwood) for this clamp rack, glue together four $5/4 \times 4 1/2$ " segments edge to edge, so the grain runs front to back for maximum strength. When dry, sand it smooth, then drill $3/8$ " holes at the back of the slots. Cut the slots with a jigsaw, then glue and screw together as shown.

7 PLIERS RACK



NOTE: Create the mortises for the pliers handles by first drilling $\frac{7}{8}$ " holes, and then jigsawing them to rectangular shape. Adapt the spacing to suit your tools.

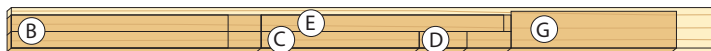
8 DRILL RACK



Cutting Diagram



$\frac{3}{4}$ x 48 x 96" Medium-density fiberboard



$\frac{3}{4}$ x 5 1/2 x 96" Pine (4 bd. ft.) (2 needed)



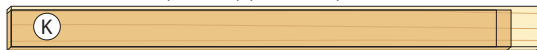
$\frac{3}{4}$ x 5 1/2 x 96" Pine (4 bd. ft.) (2 needed)



$\frac{3}{4}$ x 5 1/2 x 96" Pine (4 bd. ft.) (2 needed)



$\frac{3}{4}$ x 5 1/2 x 72" Pine (3 bd. ft.) (2 needed)



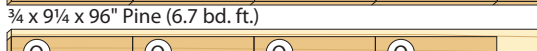
$\frac{3}{4}$ x 5 1/2 x 72" Pine (3 bd. ft.) (2 needed)



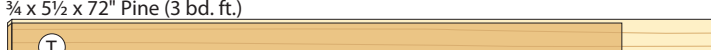
$\frac{3}{4}$ x 7 1/4 x 96" Pine (5.3 bd. ft.)



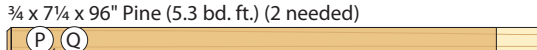
$\frac{3}{4}$ x 9 1/4 x 96" Pine (6.7 bd. ft.)



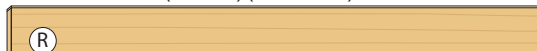
$\frac{3}{4}$ x 5 1/2 x 72" Pine (3 bd. ft.)



$\frac{3}{4}$ x 7 1/4 x 96" Pine (5.3 bd. ft.) (2 needed)



$\frac{3}{4}$ x 3 1/2 x 72" Pine (2 bd. ft.) (10 needed)



$\frac{3}{4}$ x 9 1/4 x 72" Pine (5 bd. ft.)



$\frac{3}{4}$ x 3 1/2 x 24" Maple (.7 bd. ft.)

Materials List

| Part | FINISHED SIZE | | | Matl. | Qty. |
|-----------------------|-----------------|---------|---------|-------|------|
| | T | W | L | | |
| Bench | | | | | |
| A* tops | $\frac{3}{4}$ " | 22 1/2" | 64 1/2" | MDF | 2 |
| B outer leg faces | $\frac{3}{4}$ " | 2 1/4" | 29 1/2" | P | 8 |
| C upper leg cores | $\frac{3}{4}$ " | 2 1/4" | 21 1/2" | P | 4 |
| D lower leg cores | $\frac{3}{4}$ " | 2 1/4" | 6 1/2" | P | 4 |
| E inner leg faces | $\frac{3}{4}$ " | 2 1/4" | 33" | P | 4 |
| F outer end rails | $\frac{3}{4}$ " | 5" | 18" | P | 2 |
| G inner end rails | $\frac{3}{4}$ " | 5" | 22 1/2" | P | 2 |
| H* outer stretchers | $\frac{3}{4}$ " | 5" | 63" | P | 2 |
| I* inner stretchers | $\frac{3}{4}$ " | 4 1/4" | 63" | P | 2 |
| J end aprons | $\frac{3}{4}$ " | 5" | 22 1/2" | P | 2 |
| K* front/back aprons | $\frac{3}{4}$ " | 5" | 66" | P | 2 |
| L* front clamp blocks | $\frac{3}{4}$ " | 2 3/16" | 4 3/8" | M | 3 |
| M* end clamp blocks | $\frac{3}{4}$ " | 1 5/8" | 4 3/8" | M | 2 |
| N clamp block cleats | $\frac{3}{4}$ " | 2 1/2" | 4 3/8" | P | 5 |
| O shelf slats | $\frac{3}{4}$ " | 4 1/2" | 16 1/2" | P | 14 |
| Wall Unit | | | | | |
| P base wall support | $\frac{3}{4}$ " | 3 1/2" | 66" | P | 1 |
| Q wall cleats | $\frac{3}{4}$ " | 3 1/2" | 66" | P | 9 |
| R shelf | $\frac{3}{4}$ " | 9" | 72" | P | 1 |
| S shelf cleat | $\frac{3}{4}$ " | 2 1/4" | 66" | P | 1 |
| T shelf braces | $\frac{3}{4}$ " | 6 3/4" | 83" | P | 2 |
| U brace cleats | $\frac{3}{4}$ " | 1 1/2" | 83" | P | 2 |

*Parts initially cut oversize. See the instructions.

Materials key: MDF—medium-density fiberboard, P—pine, M—maple.

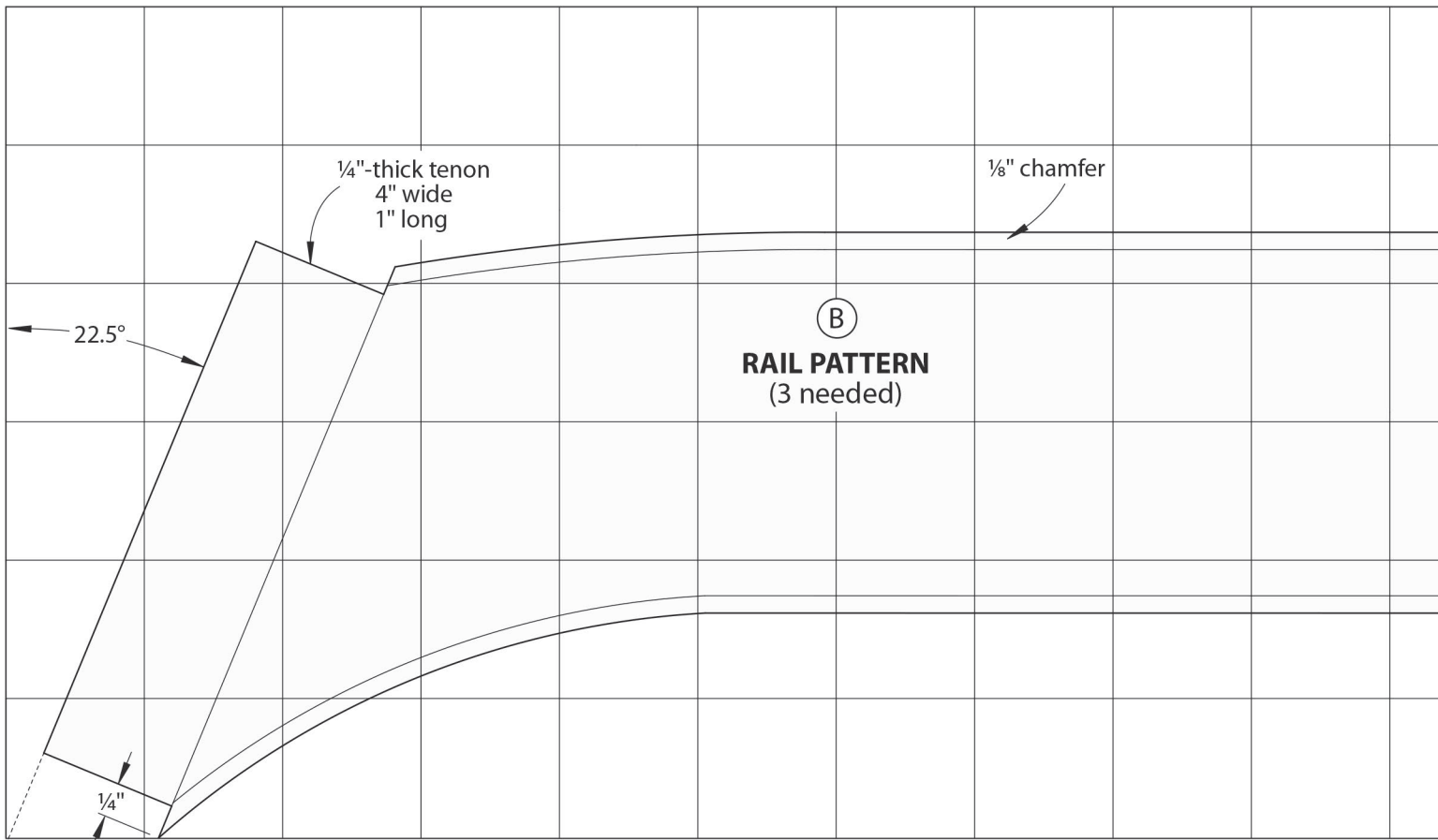
Supplies: #8x1 1/2" F.H. screws (10), #8x2" F.H. screws (54), #8x2 1/2" F.H. screws (33), #8x3" F.H. screws (20), 3/4" dowel 36" long.

Bits: 3/4" spade bit, 7/8" spade bit, 3/16" brad-point bit.

Source

Fasteners: FastenMaster 4 1/2" structural wood screws (lowes.com, no. 194827, 12 per pack, driver bit included).

Written by **Mike Berger**
Produced by **Bob Hunter** with **John Olson**
Project design: **John Olson**
Illustrations: **Roxanne LeMoine;**
Lorna Johnson

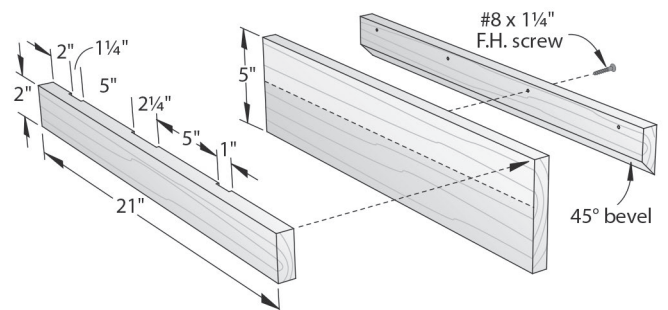


Accent Table
Page 30

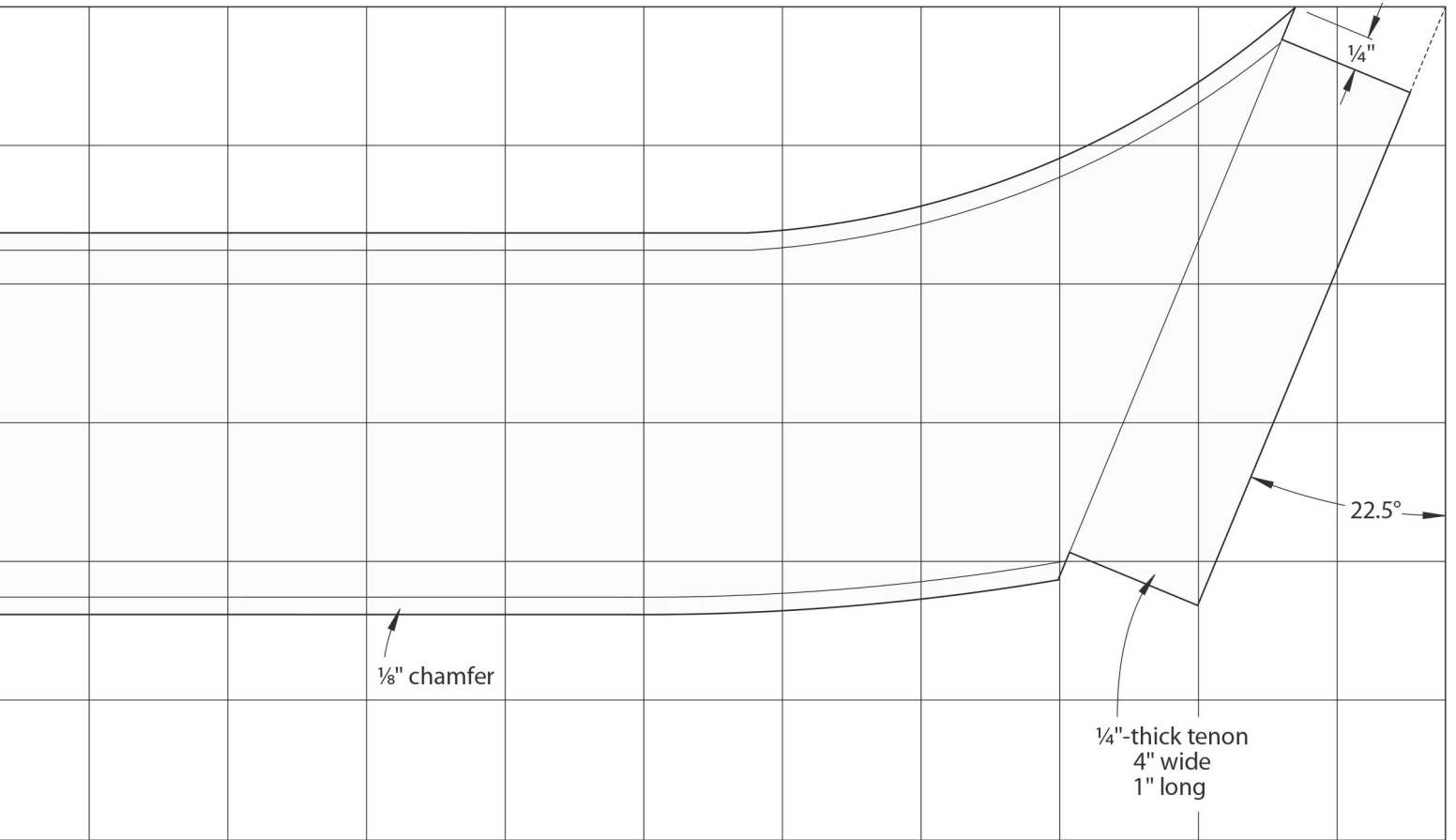


**Additional Tool Rack Plans
for the Workcenter**

SQUARE RACK

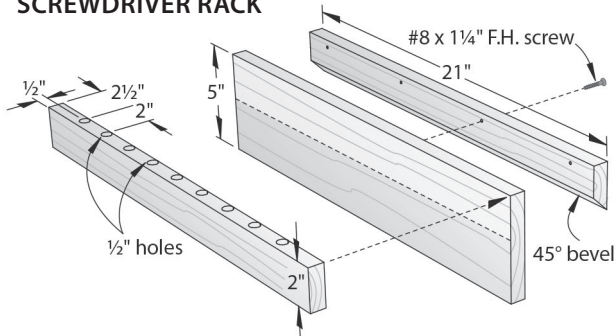


NOTE: Cut the square-holding dadoes on your tablesaw before gluing the parts together. Vary the dado width and spacing to suit your squares.



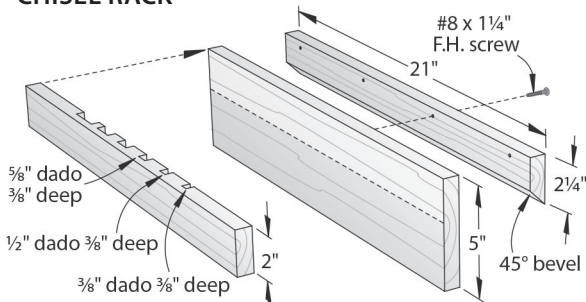
Square=1"
Scale 130% for
Full-Size Pattern.

SCREWDRIVER RACK

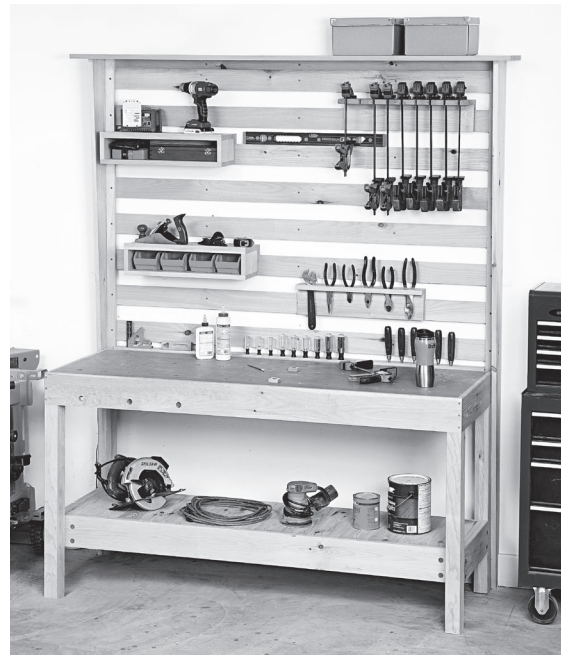


NOTE: Drill the holes for the screwdriver shanks after gluing up the three boards. Vary the hole size and spacing to suit your screwdrivers.

CHISEL RACK



NOTE: Cut the chisel-holder dadoes on your tablesaw before gluing the parts together. Vary the dado width and spacing to suit your chisels.



Built-to-last Workcenter
Page 24