

Modified Roubo Is

Most woodworkers build only one workbench. I've had the luxury of building seven so far. Why so many? Partly because I need extra benches in my shop for teaching classes. But also because I love having benches that excel at holding different kinds of work.

With all the different benches and vises in my shop, I thought I'd experienced about everything in the realm of workbenches. But a year ago I built a small bench to test out two new vises from BenchCrafted that had caught my eye—one a leg vise and the other a wagon vise (see *Tools & Materials*, *FWW* #225). Both are based on traditional designs but updated with wheel-style handles and acme threads, and built to exceptional standards of quality. For all-around work-holding, these vises were a revelation. They held more securely and were easier to adjust than any other vises I've used. Spin the wheel with one finger and the vises closed on a workpiece with a convincing thunk. They were also easier to install than many other vises. Before I'd had the use of the new bench for a month, it had become my favorite, and I decided that I needed to make a full-size version using BenchCrafted vise hardware.

Powerhouse vises left and right

The bench I built is a modified Roubo-style with a very heavy top and a beefy base. What makes it a Roubo (André Jacob Roubo was a French cabinetmaker in the 1700s who wrote an influential treatise on woodworking) is the massive size, the blocky legs flush to the front edge of the benchtop, and the leg vise, a centuries-old style with a huge jaw that offers superb clamping pressure and lots of space for the

State-of-the-art vises take it to another level

BY JEFF MILLER

workpiece. To function properly, a leg vise requires that the front edge of the benchtop be in the same plane with the front face of the leg.

The vise screw is 8 in. below the surface of the bench, allowing the vise to accommodate very large workpieces, with the vise jaw, leg, and edge of the bench



the Ultimate Workbench



WAGON VISE

Strong vise, solid benchtop. Based on a traditional design, the BenchCrafted wagon vise provides benchdog clamping without a large movable jaw to compromise the integrity of the top. The vise can also be used to clamp boards vertically (right).



LEG VISE



A leg vise with leverage. Another take on an old design, BenchCrafted's new leg vise is versatile, powerful, and silky smooth in use. To keep the jaw parallel to a workpiece, you place a pin in one of a series of holes in the parallel guide (left).



 **SEE IT IN MOTION**



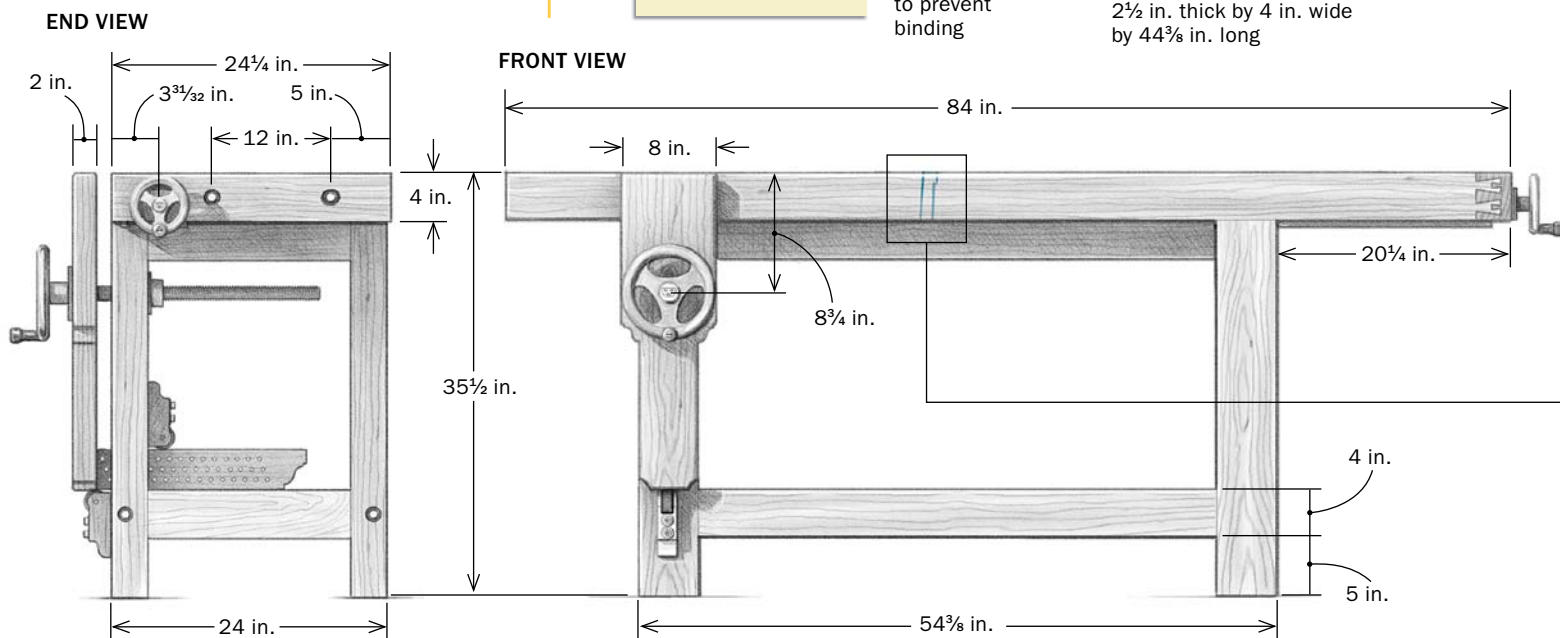
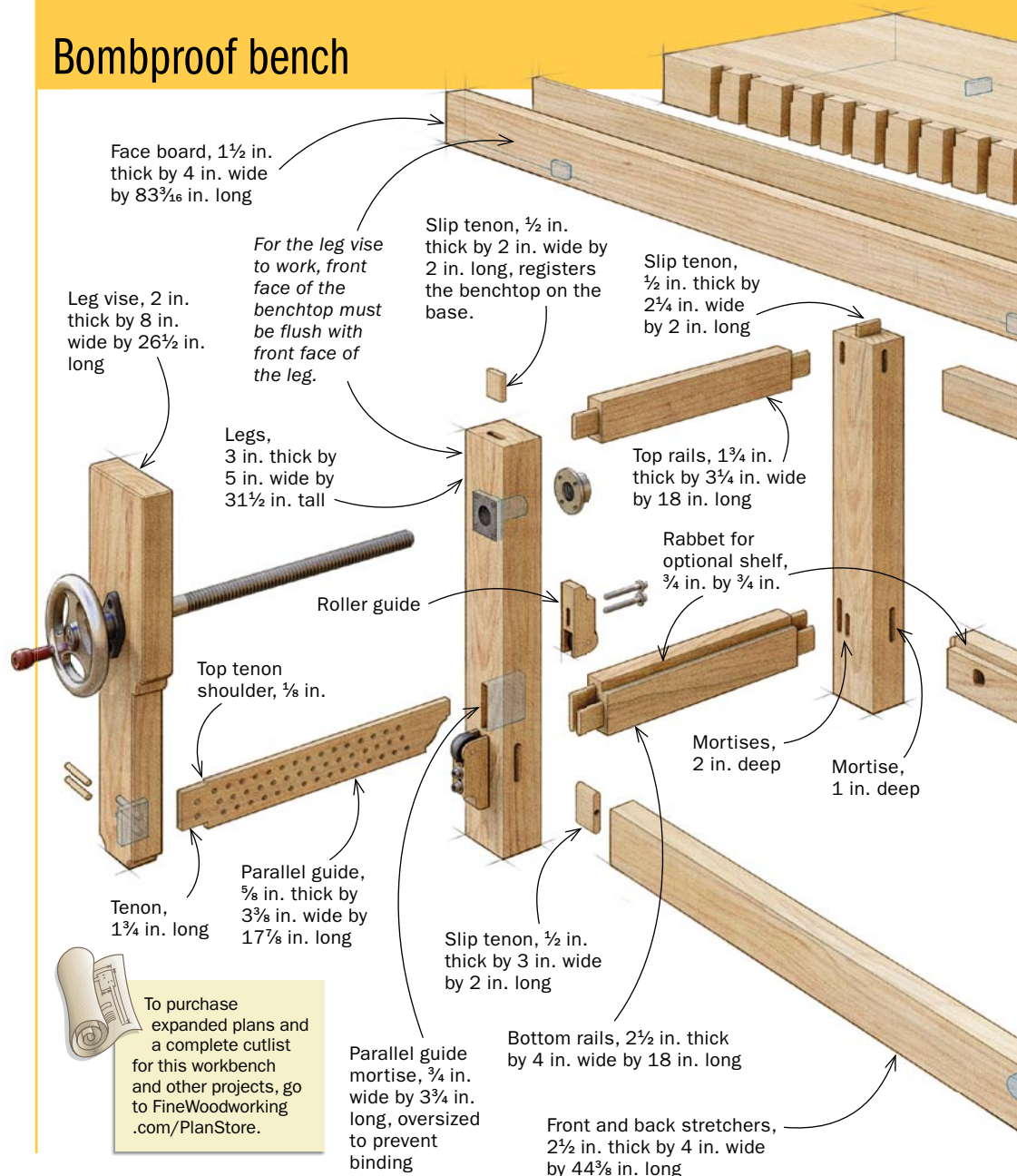
providing a solid grip unmatched by other vises. However, to do so, the leg vise incorporates an adjustable “parallel guide” at the bottom that must be set to roughly the thickness of the workpiece with a removable pin. The extra step takes a little getting used to, but the results are well worth it. BenchCrafted will soon have a new version of the leg vise available, at a higher price, with a scissor mechanism that will eliminate this step.

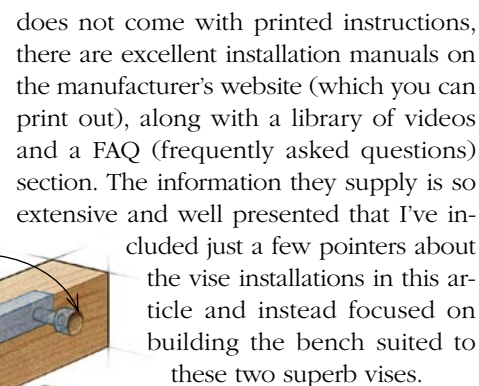
At the right end, in place of a standard tail vise, is the wagon vise—basically a sliding block with a benchdog that rides in a slot in the top. The huge advantage of this style of vise is that while providing tenacious clamping action for workpieces on the benchtop, the wagon vise has no tail that can loosen up, sag, or vibrate. This makes a big difference in how secure your work feels on the bench. Also, when you’ve used a wagon vise for a while, you will no longer avoid using the front right section of your workbench—it will be just as firm and flat as the rest of the top. Suddenly, you have the whole bench at your disposal.

One thing you give up when you install a wagon vise is the ability to clamp very large and thick workpieces, such as bedposts, in the vertical position, the way you can with a traditional tail vise. The wagon vise gives you something in return, however: a slot in the benchtop where you can clamp tall boards up to 4 in. wide and 1¾ in. thick, for dovetailing, for example.

Although the BenchCrafted vise hardware

Bombproof bench





Weight is the key to a stable bench, especially one that will be used frequently for handplaning and chisel work, and in keeping with the uncompromising nature of the vises, I decided to make the top of the bench a solid slab 4 in. thick by 24 in. wide by 84 in. long—about 165 lb. of ash. After milling flatsawn 8/4 stock, I ripped boards a bit over 4 in. wide and stood them on edge to glue them together, giving me a very stable, quartersawn slab.

You could save some wood and make a portion of the top thinner. You can even hide that fact if you add an end cap to the leg vise end of the bench. But the weight and thickness are an advantage, helping keep the bench very stable even during aggressive work. And having a top of consistent thickness makes clamping down workpieces simpler.

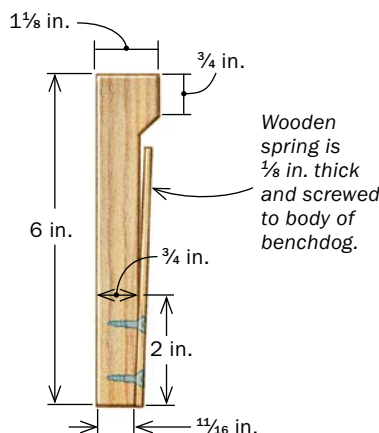
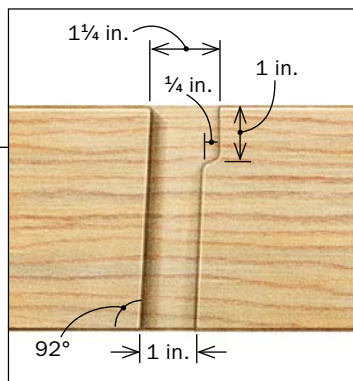
The top has four main components: the main section, the dog-hole board, the face board, and the end cap. I started with the main section. At 4 in. thick by 21 in. wide by 7 ft. long, it is a beast. I decided to glue it up in three 7-in.-wide subassemblies to make the glue-ups more manageable.

Even so, it helps to work with a glue that has an extended open time, so you have more than a few minutes to get each section assembled. To keep the boards in alignment during the glue-up, I used hand-screw clamps at either end, working from one side to the other and tweaking as necessary. I get a very flat result with this method, but if you're inclined you can cut biscuit joints to keep the boards in register—don't glue the biscuits, since they are just serving to ensure good alignment.

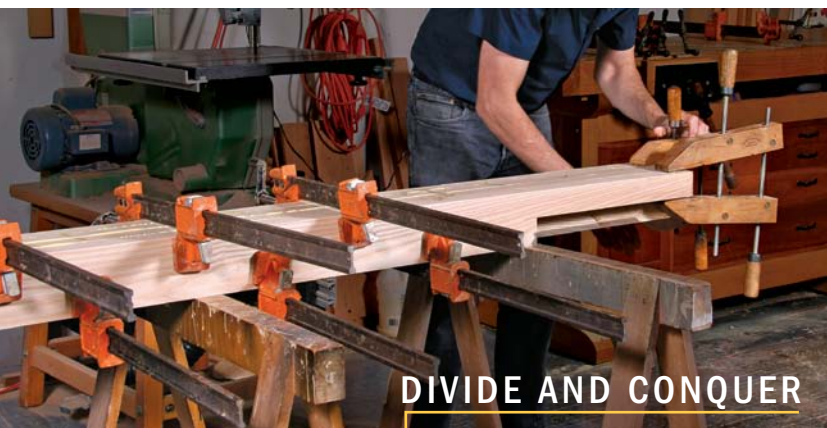
After the glue cured, I ran the three sub-assemblies through the jointer and planer

**BENCHCRAFTED
GLIDE LEG VISE AND
TAIL VISE**
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DOG HOLE DETAIL



How to tame a massive top



DIVIDE AND CONQUER

Three stage glue-up. Miller made the 21-in.-wide main section of the benchtop in three 7-in. subassemblies, giving him better control of the glue-ups. He used hand-screw clamps to keep the boards aligned (above).

Machining a major workpiece. Before gluing the three subassemblies together, Miller jointed them flat and square. He used infeed and outfeed supports to aid the process (right).

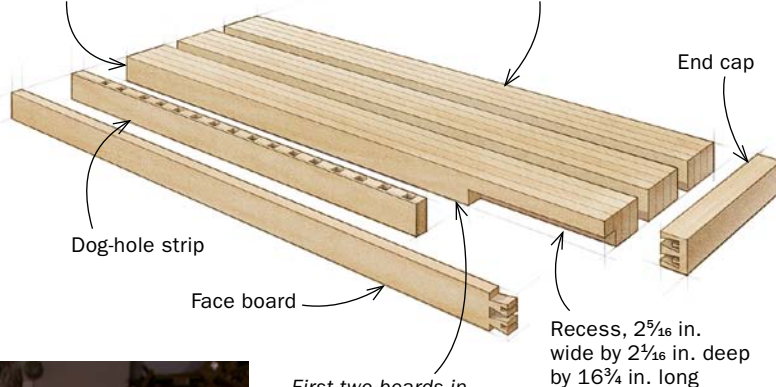
It's a cinch. The three subassemblies came together in the final glue-up of the main section of the benchtop (below). Clamps top and bottom evened out the pressure. Clamps on the ends aligned the sections.



PARTS OF THE BENCHTOP

Main section comprises three subassemblies.

Flatsawn boards glued face-to-face create a very stable quartersawn slab.



Dog-hole strip

Face board

End cap

Recess, $2\frac{5}{16}$ in. wide by $2\frac{1}{16}$ in. deep by $16\frac{3}{4}$ in. long

First two boards in front subassembly are notched before glue-up to create recess for wagon vise.

and glued up the complete main section of the top. Again I used hand-screw clamps during the glue-up to bring the three sections into the same plane, but a few biscuits could perform the same function.

Creating the rest of the benchtop

The best way to make square dog holes is by routing slots across one board and gluing a thinner board to it. Before cutting the slots with a router jig, I wasted away most of the wood with a dado set on the tablesaw. Because the dog holes were to be 2° off vertical, I tacked a slightly angled temporary fence to the bed of a crosscut sled to make the dado cuts.

Gluing the slotted board to its facing piece is a little tricky. The boards are floppy, and should be glued against a flat surface—I used the main section of the top. Spread the glue carefully to avoid squeeze-out inside the dog holes. The end cap has a large mortise to accept the tenon on the right end of the benchtop. It's easy to rout the slot for the mortise using a plunge router and an auxiliary fence. To support the router throughout the cut, I left the end cap a few inches overlong on both ends.

Trim and tenon the top

I made a simple cuff jig that works both for cutting the bench to length with a circular saw and for milling the big tenon that will mate with the end cap. The jig provides fences across the top and bottom that are

exactly in register. If you need to adjust the alignment of the fences after screwing the jig together, give it a pass over the jointer.

After cutting the bench to length, I used the cuff jig and a straight bit to rout the large tenon on the end of the top. I cut back both tenon ends with a handsaw and cleaned up the shoulder with a shoulder plane.

Then I put the end cap in place and marked and cut the back end of it flush to the back edge of the benchtop. To see where to cut the end cap at the front, I slid the face board in place and marked along its outside face.

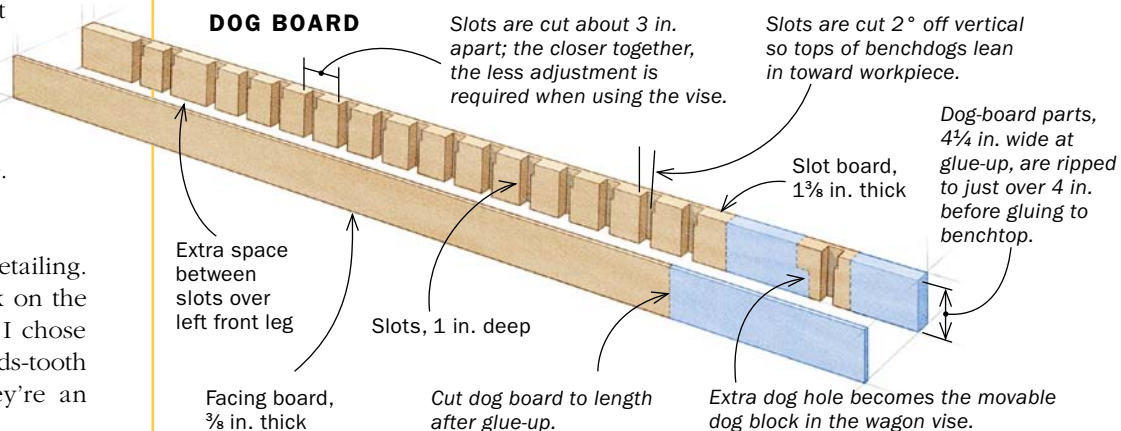
Do the dovetails

Now I was ready to do the dovetailing. It's the signature bit of handwork on the bench, and for a little extra flair I chose to use double-dovetails—or hounds-tooth dovetails as they're called. They're an

SQUARE DOG HOLES MADE EASY



Dado and rout. After plowing out most of the waste with a dado set, Miller used a jig and router with a rub collar to create the benchdog slots. Then he added a facing board to close off the holes.

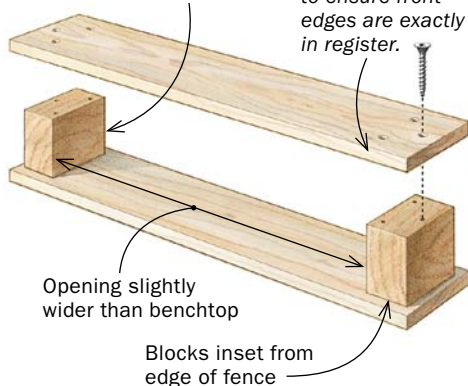


Save the extra dog hole. When the glue was dry, Miller cut the dog board to length. He used the extra dog hole (above) to make the moveable dog block for the wagon vise. Then he glued the dog board to the benchtop and planed it flush.

CUFF JIG

Spacer blocks, same thickness as benchtop

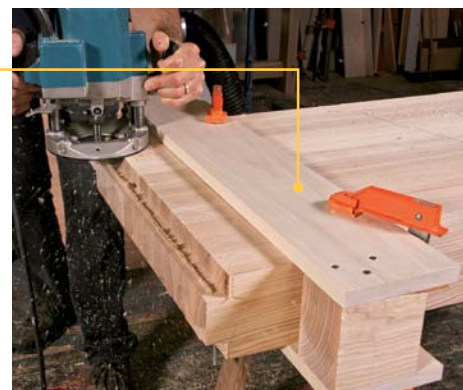
After assembly, jig can be passed over the jointer to ensure front edges are exactly in register.



ONE JIG, TWO USES



Big crosscut, big tenon. Miller's cuff jig gives him perfectly aligned fences above and below. He used it to cut the benchtop to length with a circular saw (left), cutting halfway through from each face. Then he moved the jig and used it with a router (right) to cut the massive tenon that will mate with the end cap.



Face board and end cap go on together



Tails first. Miller used the bandsaw (with a support stand to keep the long workpiece level) to cut the tails in the face board. The rabbet visible below the tails (above) provided better registration (right) when Miller marked the pins on the end cap from the tails.



A lot of chopping. Although Miller started excavating the pins with a trim router, most of the wood had to be removed by hand.



Dry-fit the end cap. The end cap is fitted to the tenon and bolted in place through oval clearance holes (above) to allow for seasonal movement of the top. With the cap in place, Miller used the Bench-Crafted template to mark it for the wagon vise handle hardware (right); then he removed the end cap and took it to the drill press.



Online Extra

After assembly, Miller flattened this benchtop with handplanes. To see how, go to FineWoodworking.com/extras.

added challenge, but they provide more strength plus pizzazz. I cut the tails in the face board at the bandsaw with a support behind me to keep the 7-ft.-long board flat on the table. Using the bandsaw (vs. a handsaw) makes it easy to keep the sides of the tails square. I used the bandsaw to nibble away the waste between the tails, then cleaned up to the scribed base lines with a chisel. I cut away the waste to the outside of the tails on the tablesaw.

With the tails finished, I scribed the pins from them with a knife. I used a combination of hand sawing, routing, and chiseling to cut the half-blind pins. To clean out the waste, I worked the chisels in all directions—with the grain, against it, and across it.

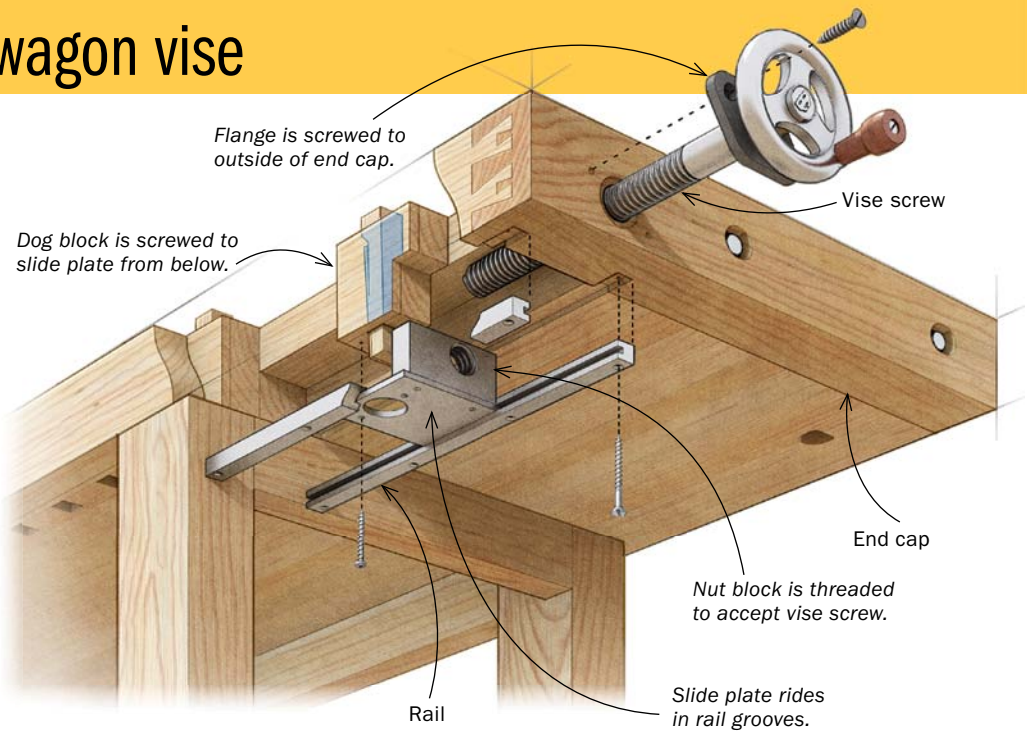
Don't assemble yet

Its best to mark and drill the end cap for the wagon vise screw hardware before

Tips for installing the wagon vise



Bridge the gap. A wide sub-base screwed to the router provided the support so Miller could rout accurate grooves for the two wagon vise rails, working with the benchtop upside down.



final assembly of the top. With the end cap bolted in place, I used the paper template provided by BenchCrafted to locate the holes, then unbolted the end cap and took it to the drill press.

Similarly, it's much easier and more accurate to drill the holes and rout the mortises in the left front leg and the leg vise's jaw before the base is assembled. All the holes are better cut at the drill press, and cutting the through-mortise for the parallel guide in the left front leg (which is 3 in. thick), if done with a router, requires working from both the inside and outside faces of the leg.

Mating the base to the benchtop

Because the leg vise relies on having the benchtop flush with the front face of the legs, the precise location of the benchtop on the base is essential. I used slip tenons in the tops of the legs to keep the base and top in register. I glued the tenons into the legs but left them dry in the top. Once the base was glued up, I inverted it on the underside of the benchtop and used squares and straightedges to locate it exactly. Then I scribed around the tenons and routed mating mortises in the underside of the top. I made the rear mortises oversize in length by $\frac{1}{4}$ in. to permit the top to expand and contract.

Final flattening

When it comes time to level and smooth the top of a bench, I do the job with

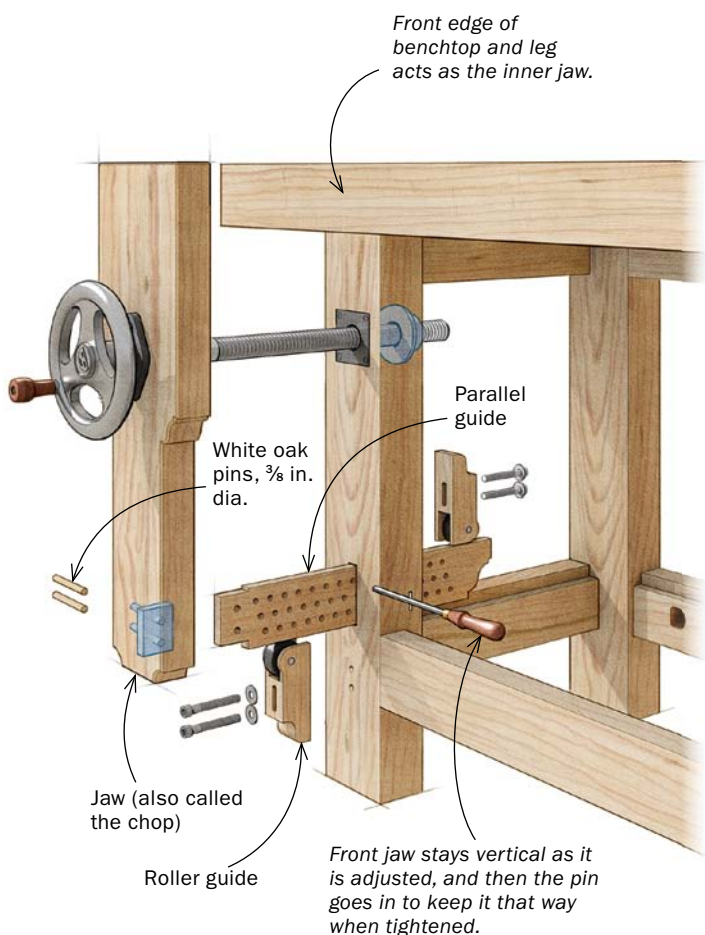


Two rails in one plane. To ensure that the wagon vise operates smoothly, its rails must be perfectly parallel and lie in the same plane.



Drop in the dog block. With the benchtop flipped right side up, Miller fitted the dog block into its slot and fastened it to the moving plate with a screw from below. The nut block reinforces it well in use.

Keys to a solid leg vise



handplanes. It takes some elbow grease, but it's not terribly difficult. If you're not inclined for the workout, you could always outsource the flattening to a shop with a thickness sander. Either way, it's an important step in the process. The flatter the benchtop, the better you'll like your bench, knowing that you can count on it as a reference surface.

I start by planing directly across the top at 90° to the grain direction. You could use winding sticks and straightedges to check your progress, but the planing itself gives plenty of indication of where the low and high spots are.

Then I switch to working the top at a 45° angle. I cover the top completely, then work it at 45° the other way. Lastly, I switch to planing with the grain, taking much lighter shavings for these final passes.

I want it dead flat, but I don't fuss about getting a furniture-quality surface. It's a workbench, after all, and I want to hurry up and put it and those two new vises to use. □

Jeff Miller works wood in a converted post office in Chicago. He teaches woodworking there and around the country.



Drill before assembling the base. After using a Forstner bit to drill a hole through the leg-vise jaw for the vise screw, Miller used the same bit as a transfer punch to mark the front leg for drilling.



Base and top must be flush. For the leg vise to work properly, the front leg must be flush with the front of the benchtop. With the base aligned, Miller marked the position of the slip tenons in the leg tops so he could rout mating mortises in the benchtop.



Correcting overbite. With the top flattened and the bench fully assembled, Miller marked the vise jaw so he could remove it and cut it flush with the benchtop.