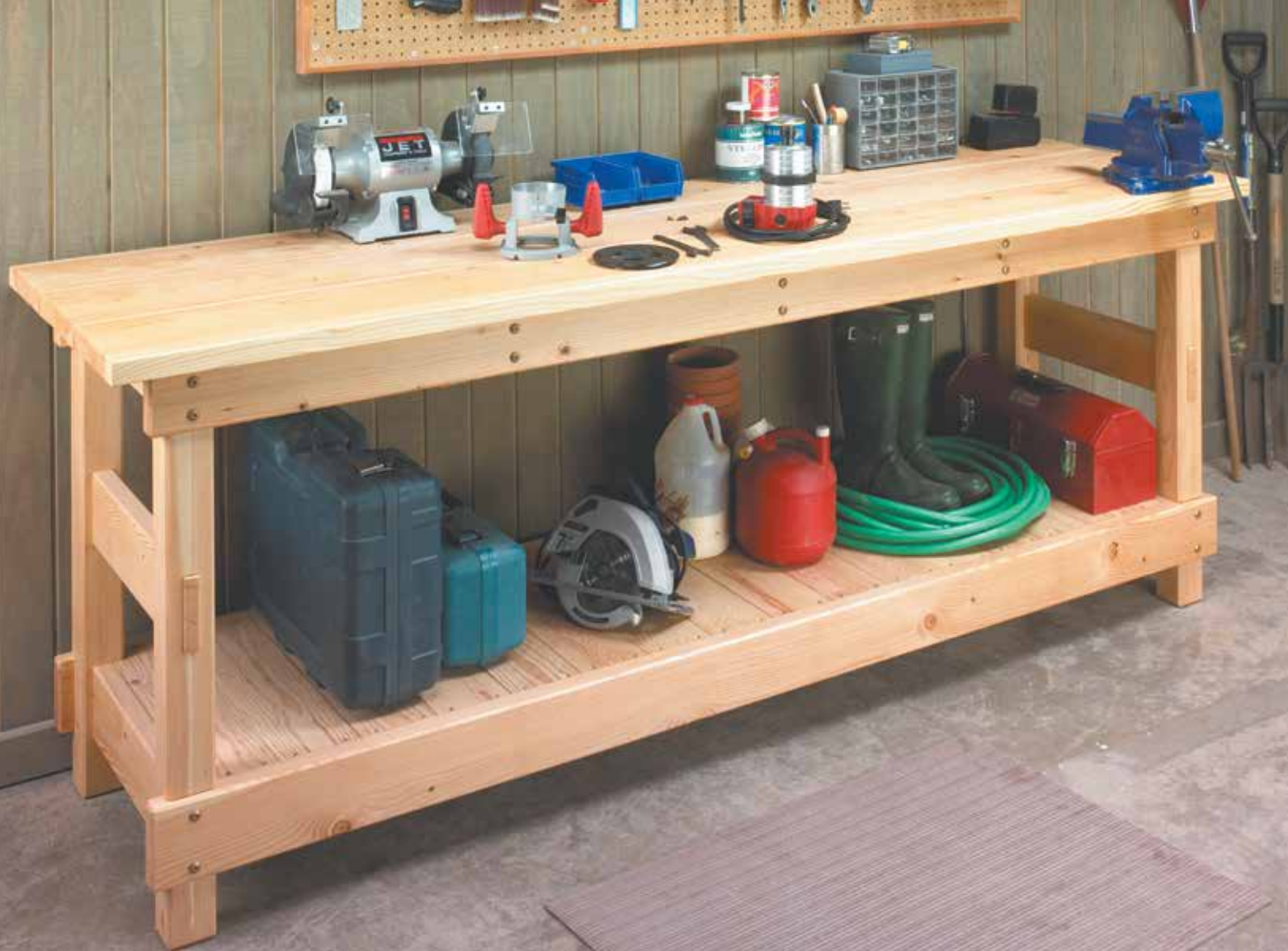


PLANK-TOP BENCH





Plank-Top Workbench

This heavy-duty bench is at home in any shop or garage. And while it only takes a weekend to build, it's guaranteed to give you a lifetime of use.

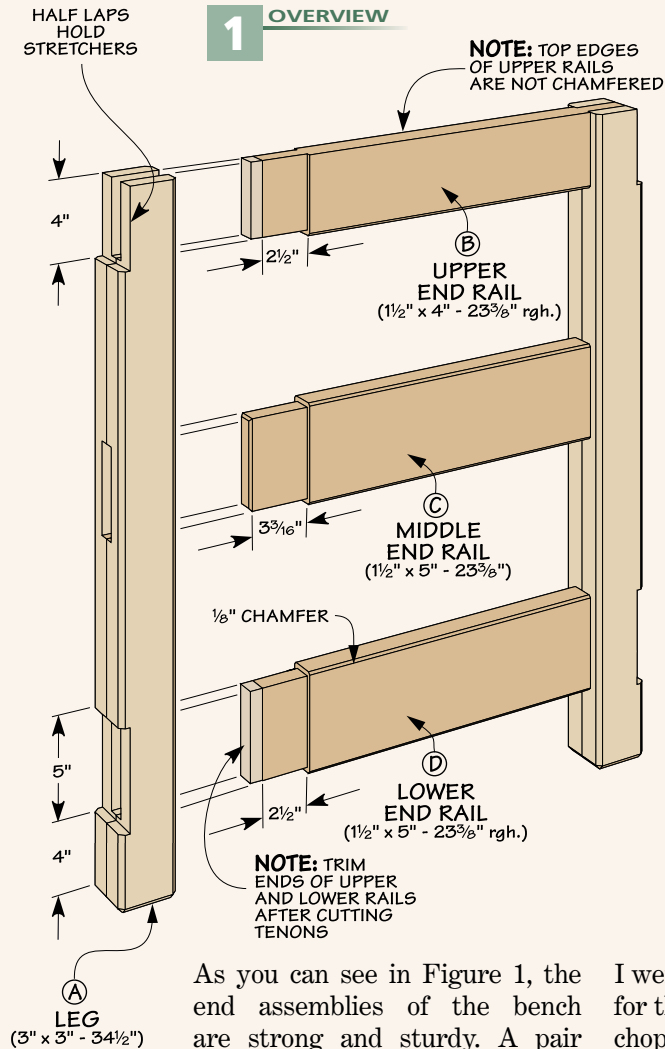
A workbench you can build in a weekend: that was my main goal when I started designing the bench you see here. And it turned out a success.

But a bench that can be built in a weekend isn't much use if it doesn't hold up over the long haul. So as you can see, I made sure to design this one to be rugged enough to stand up to heavy-duty hammering, sawing, grinding, pounding, and

just about any other form of punishment you can dish out to a bench.

Cost – One of the best things about this bench is that building it won't break the bank. I used inexpensive, commonly available construction lumber for the entire bench, including the top. Then with the money I saved, I bought a nice machinist's vise to install on the top.

Ends



As you can see in Figure 1, the end assemblies of the bench are strong and sturdy. A pair of large, square legs are joined to three rails with mortise and tenon joints. But apart from the solid construction, the interesting thing about this bench is the way

I went about making the mortises for the rails. Instead of drilling or chopping out the mortises, I cut them out on the table saw. Sounds impossible? Let me explain.

Each leg is glued up out of two separate pieces. But instead of making the mortises after the

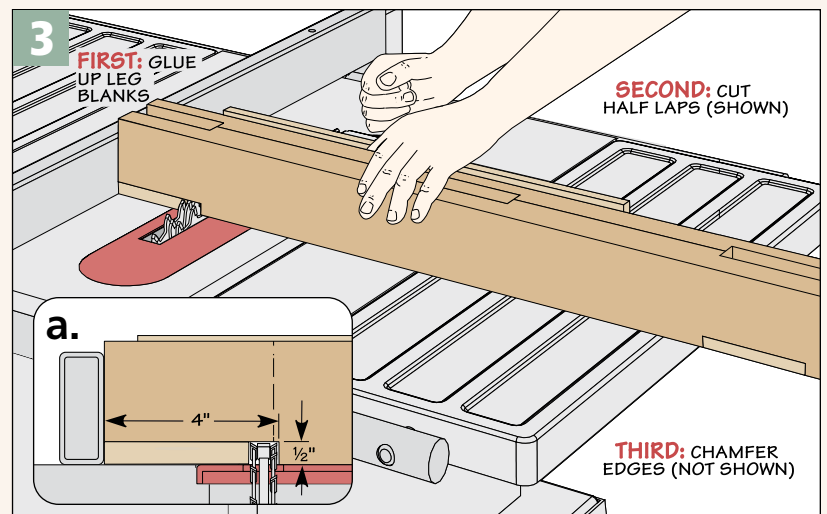
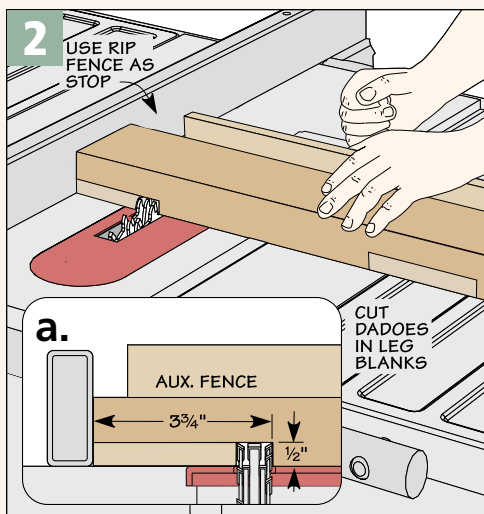


▲ Through Tenons. A few cuts on the table saw are all it takes to make perfectly sized mortises for the through tenons of the bench.

legs were glued up, I cut dadoes on the inside face of both halves of the leg beforehand. This way, you end up with perfectly sized mortises once the legs are glued up.

Legs - To make the legs, you can start by cutting out eight blanks from 1 1/2"-thick stock for the leg halves. I cut these blanks to exact length, but I made them a little wider than necessary so that I could plane the legs down to finished width (3") after they were glued up.

Once you've finished cutting all the blanks, cut the dadoes that will make up the mortises (Figures 2 and 2a). I used the rip fence as a stop when cutting the dadoes to ensure that each pair of dadoes would line up when gluing the leg blanks together.

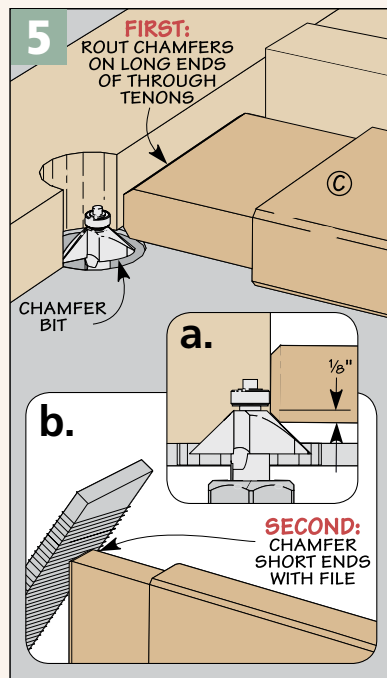
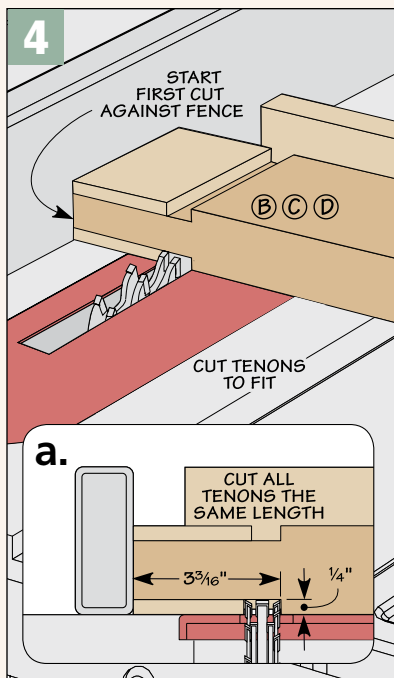


When it comes to gluing up the leg halves, the trick is keeping all the dados aligned while you're clamping the pieces together. To do this, I used some wood "keys." (Take a look at the box below to see what I'm talking about.) I simply cut some blocks of hardwood to fit in the mortises in the legs. Then I chamfered the edges and rubbed paraffin wax on the surfaces of the keys so they wouldn't get glued to the legs.

After the glue is dry, you can remove the clamps and the keys and square up the legs by planing them down to their finished width.

Half Laps – Before moving on to making the end rails, there are a couple of things left to do on the legs. First, you'll need to cut a couple of half laps on one face of each leg to hold the stretchers that will be added later. As you see in Figures 3 and 3a on page 2, the rip fence can be used as a stop to position these half laps, just as you did when cutting the dados for the mortises. Next I routed a chamfer on the edges and the bottom of each leg.

Rails – With the legs complete, the next step is to add the



end rails. At first glance, these rails look identical. But if you take a closer look at Figure 1 on page 2, you'll see that there are some slight differences. For one thing, the upper rails are slightly narrower than the lower and middle rails. And the middle rails have through tenons that stand proud of the legs while the tenons on the upper and lower rails are shorter so they end up flush with the half laps.

Don't let all this confuse you though. To make things a little simpler, I started off by cutting all the blanks for the rails to the same length (23³/₈"). This allowed me to cut identical *length* tenons on the ends of the rails (Figures 4 and 4a).

Before assembling the rails and legs, I chamfered the ends of the tenons on the middle rails using a router and a file (Figure 5). Then you can trim the tenons on the upper and lower rails to length (Figure 1). Once this is done, all you have to do is rout a chamfer on the edges of the rails (except for the top edges of the upper rails). Now you can glue up the end assemblies, making sure to check each one for square.

Glueup Tip



Waxed hardwood "keys" keep the two halves of the leg aligned during glueup. Chamfer the edges of the keys to make removal easier.

Materials & Hardware

A Legs (4)	3 x 3 - 34 ¹ / ₂
B Upper End Rails (2)	1 ¹ / ₂ x 4 - 22
C Middle End Rails (2)	1 ¹ / ₂ x 5 - 23 ³ / ₈
D Lower End Rails (2)	1 ¹ / ₂ x 5 - 22
E Upper Stretchers (2)	1 ¹ / ₂ x 4 - 90
F Lower Stretchers (2)	1 ¹ / ₂ x 5 - 90
G Cross Rails (3)	1 ¹ / ₂ x 4 - 21
H Front/Back Cleats (2)	3 ¹ / ₄ x 1 ¹ / ₂ - 82
I End Cleats (2)	3 ¹ / ₄ x 1 ¹ / ₂ - 17
J Slats (15)	3 ¹ / ₄ x 5 ¹ / ₂ - 21
K Top Planks (3)	1 ¹ / ₂ x 9 - 95

- (74) #8 x 2" Fh Woodscrews
- (30) #8 x 3" Fh Woodscrews
- (28) 5¹/₁₆" x 4" Construction Lag Screws

Plank Top & Shelf

6 FIGURE

NOTE: TOP EDGES OF UPPER STRETCHERS ARE NOT CHAMFERED

UPPER STRETCHER
(1½" x 4" - 90")

NOTE: SIZE HALF LAPS IN STRETCHERS TO FIT OVER LEGS OF BENCH

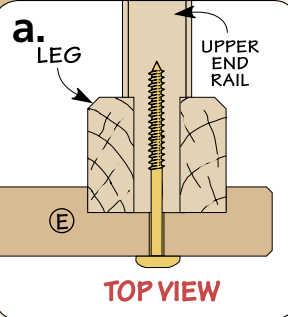
LOWER STRETCHER
(1½" x 5" - 90")

5/16" x 4" LAG SCREW

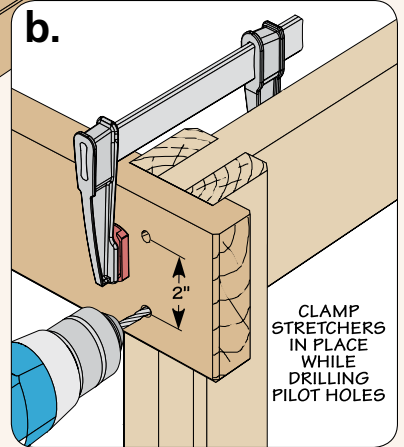
CROSS RAIL
(1½" x 4" - 21")

NOTE: TOP INSIDE EDGES OF LOWER STRETCHERS ARE NOT CHAMFERED

1/8" CHAMFER



TOP VIEW



▲ Lag Screws.
These heavy-duty construction lag screws are used to attach the stretchers to the ends and cross rails.

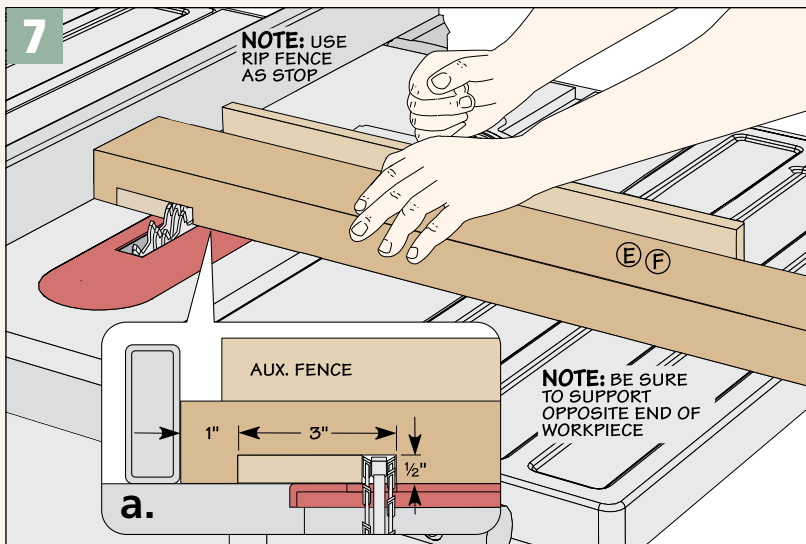
Once you have the two end assemblies complete, building the rest of the workbench goes along pretty quickly. The ends are connected with two pairs of stretchers — one at the top and one near the bottom of the legs. These serve a dual purpose. The upper stretchers help to support the top of the bench and the lower stretchers support a shelf.

Stretchers – If you take a look at Figure 6 above, you'll see that the stretchers fit into the half laps that you cut earlier on the legs. Half laps are also cut in the stretchers, creating a solid, interlocking joint. In order to get a good fit, start by sizing the width of the upper and lower stretchers to match the half laps in the legs of the bench.

Once the stretchers are cut to size, you can cut the half laps. I did this with a dado blade on the table saw, using the rip fence as a stop to position the ends of the half laps (Figures 7 and 7a). The stretchers are fairly long, so you may want to use an outrigger stand next to the table saw to help support them.

After chamfering the edges and ends of the stretchers as shown in Figure 6, you can clamp the stretchers to the ends of the bench and drill pilot holes for the screws (Figure 6b). I used some large, construction lag screws for attaching the stretchers (left margin photo). These screws are not only strong, but they have a tough, rugged appearance that matches the overall look of the bench.

Cross Rails – To help support the top of the bench, I added three cross rails between the two upper stretchers (Figure 6).



These cross rails are simply cut to length and then screwed in place between the stretchers, using the same construction lag screws.

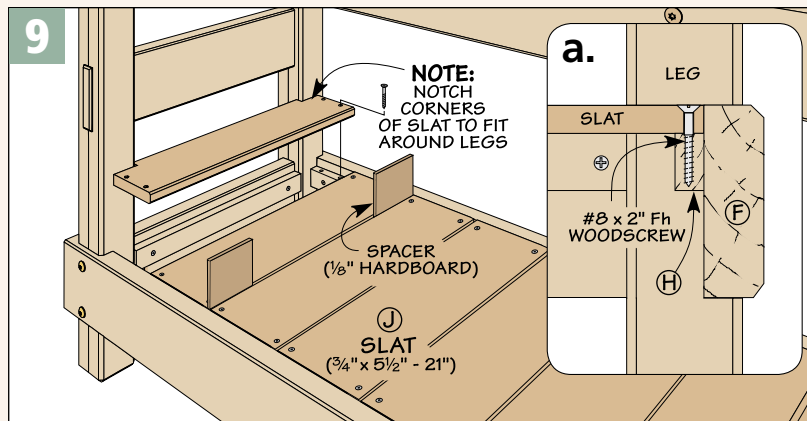
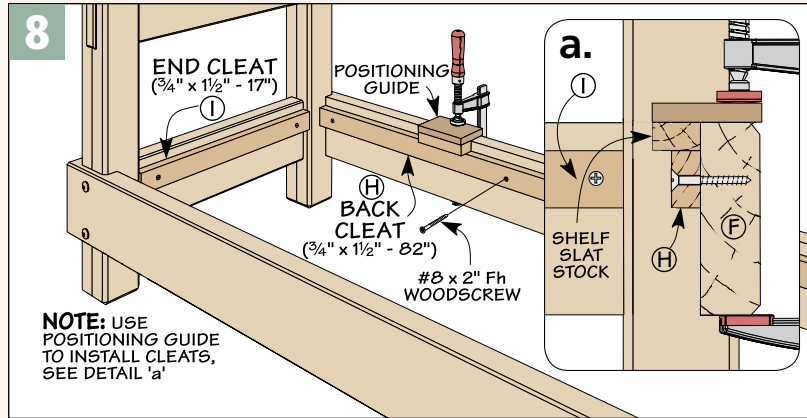
Shelf – To create some storage space under the benchtop, I added a shelf to the lower stretchers and rails. The shelf is really just a series of slats that are supported by cleats attached to the inside faces of the lower stretchers and rails.

Start by cutting the cleats to size and screwing them in place. The goal here is to position the cleats so the slats will end up flush with the top edges of the lower stretchers and rails. To make this easier, I built a quick positioning guide for installing the cleats.

I cut a small block from the same stock that I used for the shelf slats. Then I fastened this to a wider piece of wood. With the guide clamped in place, all you have to do is butt the cleat up to the bottom of the guide and screw it in place. Figures 8 and 8a show you what I'm talking about.

Once the cleats are in place, you can cut the 15 shelf slats to identical size. After chamfering the edges of the slats, I set them in place on the cleats. Start at the center of the bench and work your way out to the ends, leaving a $\frac{1}{8}$ " gap between each slat (Figure 9).

When you reach the ends,



you'll have to trim the end slats to width and notch the corners so they fit around the legs of the bench. Once this is done and the slats are fitted into position, you can go ahead and screw each slat in place.

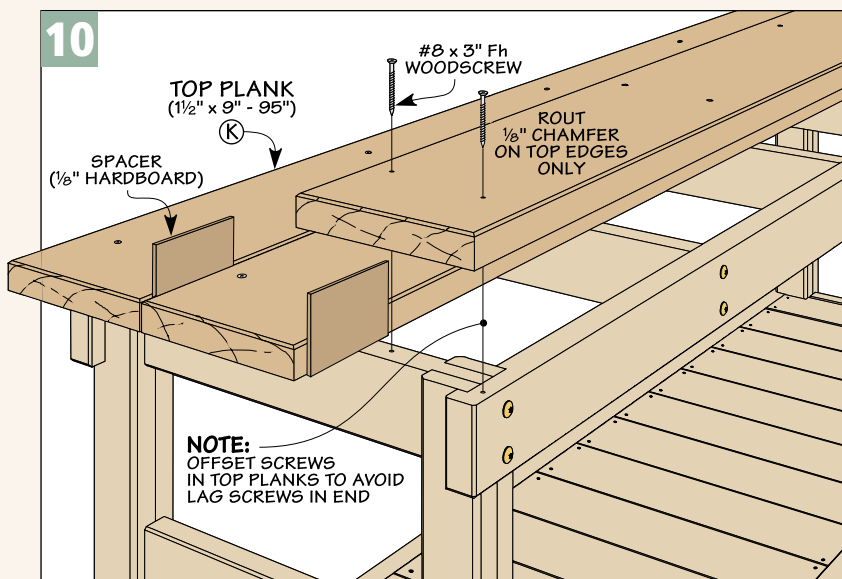
Top – At this point, the only thing left to do to complete the bench is to add the top. To avoid the time and hassle involved in

making a glued-up top, I used three separate planks. These are just cut to size and then the top edges are chamfered.

As you can see below, the planks are simply screwed in place, leaving a $\frac{1}{8}$ " gap in between each one. The only thing worth mentioning here is that in order to avoid hitting the large lag screws that connect the stretchers and rails, I offset the screws that fasten down the top planks (Figure 10).

Finally, you can apply a finish to the bench and then add a vise of your choice.

Plank Top. With a top made up of three separate planks, this bench is rugged enough to stand up to anything.



Making a Longer Plank-top Workbench

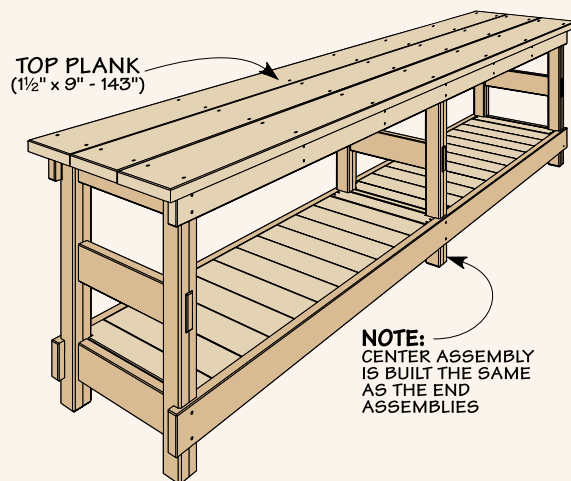
The plank-top workbench will work fine in most workshops. If you need something smaller, all you have to do is shorten up the stretchers and cleats.

A Longer Workbench – But if you'd like a longer workbench, you'll want to consider some additional support for the top, like you see in the drawing below, for a 12'-long plank-top workbench.

The additional support is provided by adding a center assembly. The nice thing is this center assembly is identical to the end assemblies. So you don't have to worry about any different parts or measurements.

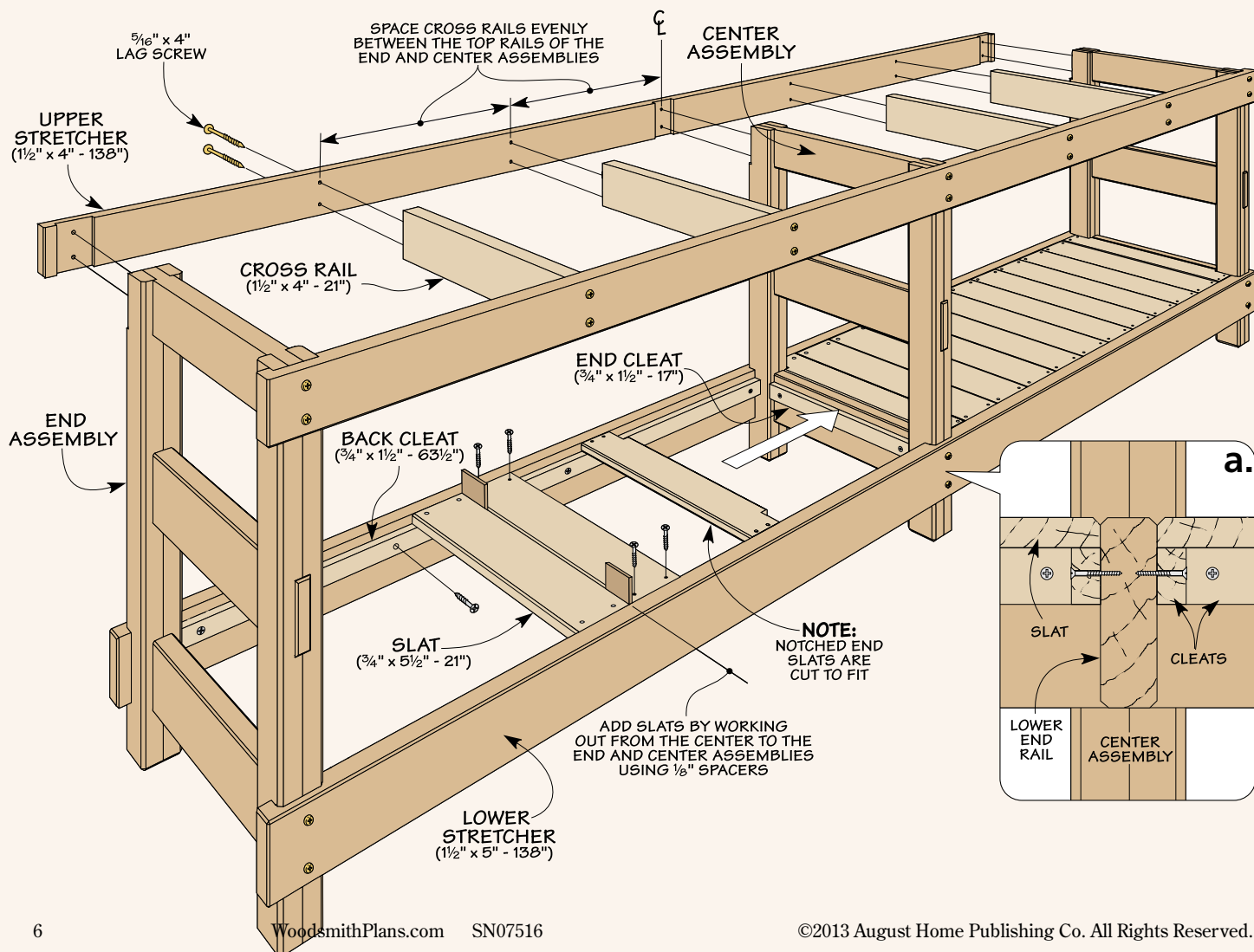
Work on the Stretchers – Once you have the end and center assemblies complete, you can work on the longer stretchers. What's different here is that to fit the center assembly in place, you'll need to cut a centered half lap on the inside face of each of the stretchers (see drawing below). After completing the half laps, you can assemble the workbench.

Add the Cross Rails – Next, add the cross rails that support the top. How many you need to add depends on the overall length of the workbench. But it's best to add enough cross rails between the end and center assemblies so



the rails are spaced evenly and they're no more than 22" apart.

Cleats & Slats – Finally, after sizing the cleats to fit between the end and center assemblies, you can add the slats. For the even number of slats shown between the end and center assemblies, work out from the center of the opening and cut the end slats to fit.



**MAIL
ORDER
SOURCES**

Woodsmith Store
800-444-7527

The Hillman Group
800-800-4900
hillmangroup.com

Project Sources

Other than some ordinary wood-screws, the only other supplies you'll need for the plank-top bench are some construction lag screws. The ones we used are manufactured by *Hillman* and have a bronze ceramic coating and a large truss head with a star drive (47877). *Hillman* screws and fasteners are carried by several major home centers.

If you have trouble finding these particular lag screws, ordinary lag bolts and washers will work equally well. (They just won't look as cool.)