Supporting Shelves *Five methods for installing*

by Stephen Winchester

I earn my living by making cabinetry—not cookie-cutter kitchens, but one-of-a-kind pieces and custom built-ins. Every cabinet I build has at least one shelf. And some—hutches and book cabinets, for example-have many. As both designer and fabricator in most cases, I try to balance style, function and cost when figuring out how to support shelves in a cabinet.

Over the years, I have come to favor several techniques that achieve that happy balance between elegance and efficiency (the five methods I use most often are described below and on the following four pages). My methods aren't as crude as using stamped-steel brackets but neither are they as fussy as routing tapered sliding dovetails.

Fixed or adjustable shelving

Style of cabinetry is the most important factor in determining which of the methods of shelving support I use. The next most important factor is cost. For cabinets in kitchens, pantries and utility rooms, fixed shelves are generally fine (see the story below). But for most of my work, clients want adjustable shelves. Shelf standards,

BLIND-NAILED DADO

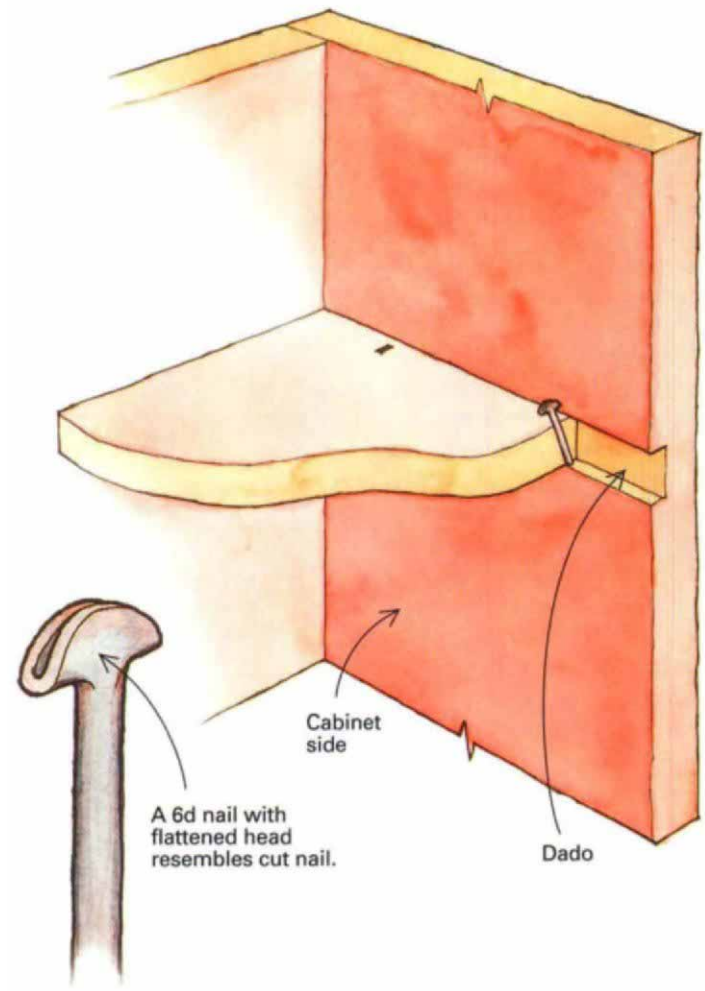
For fixed shelving, there's only one choice

Here in New Hampshire, painted pine cupboards are popular. They're a frequent choice for kitchen cabinets, where one or two shelves are all that's necessary. These shelves can be fixed at standard intervals to allow for stacks of plates and glasses. For these shelves, I use a blind-nailed dado (see the drawing at right). It's quick, and the shelves are strong and look neat.

Because my clients like the look of handplaned boards, I plane the sides, top, bottom and shelves of the cupboards after taking them to thickness with my planer. Then I cut the shelf stock ¾ in. longer than the inside measurement of the cabinet (this allows for a ⅜-in. dado in each upright) and mark the dadoes directly from the ends of the shelves, using a sharp knife. I also number everything so that if the shelves vary slightly in thickness, they will still fit their dadoes snugly.

I remove the waste with the radial-arm saw, using a dado set that's slightly smaller than the width of the finished slot. I take two passes and cut just to the scored line on each side. Shelves are installed as the case is assembled. Then I drill for the nails to avoid splitting the stock. I use 6d box or finish nails and take care not to drive one through the side of the cabinet. With the box nails, I hammer the heads flat on the sides, so they look more like a cut nail.

These cabinets are of a traditional style, so I usually attach a face frame to their front edges. If you want a frameless, more contemporary-looking cabinet, you could stop the dadoes shy of the front of the cabinet, square them up and have blind dadoes.



Drawings: Jim Richey

long vertical tracks that go into a case's sides, are the most visible and utilitarian-looking, but they're also the quickest to install (see the story below). Drilling holes in the side of the case for shelf pins is the next quickest (see the story on p. 76). Another technique employs what I call invisible wires that slip into thin kerfs in the ends of the shelves (see the story on p. 77). And there are sawtooth supports, which are quite elegant, but relatively time-consuming (see the story on p. 78). The more complicated the method, the more I have to charge.

As far as function goes, any of these supports will hold a reasonable load: 3 ft. of books shouldn't be a problem. Even the thin, invisible wires have a tremendous amount of shear strength.

In the rare instances I've made shelves longer than 36 in., I've used a strongback, which is a wooden reinforcing bar either beneath or at the front of a shelf. Even with a strongback, though, I wouldn't plan to stack 4 ft. of encyclopedias on an otherwise unsupported shelf. □

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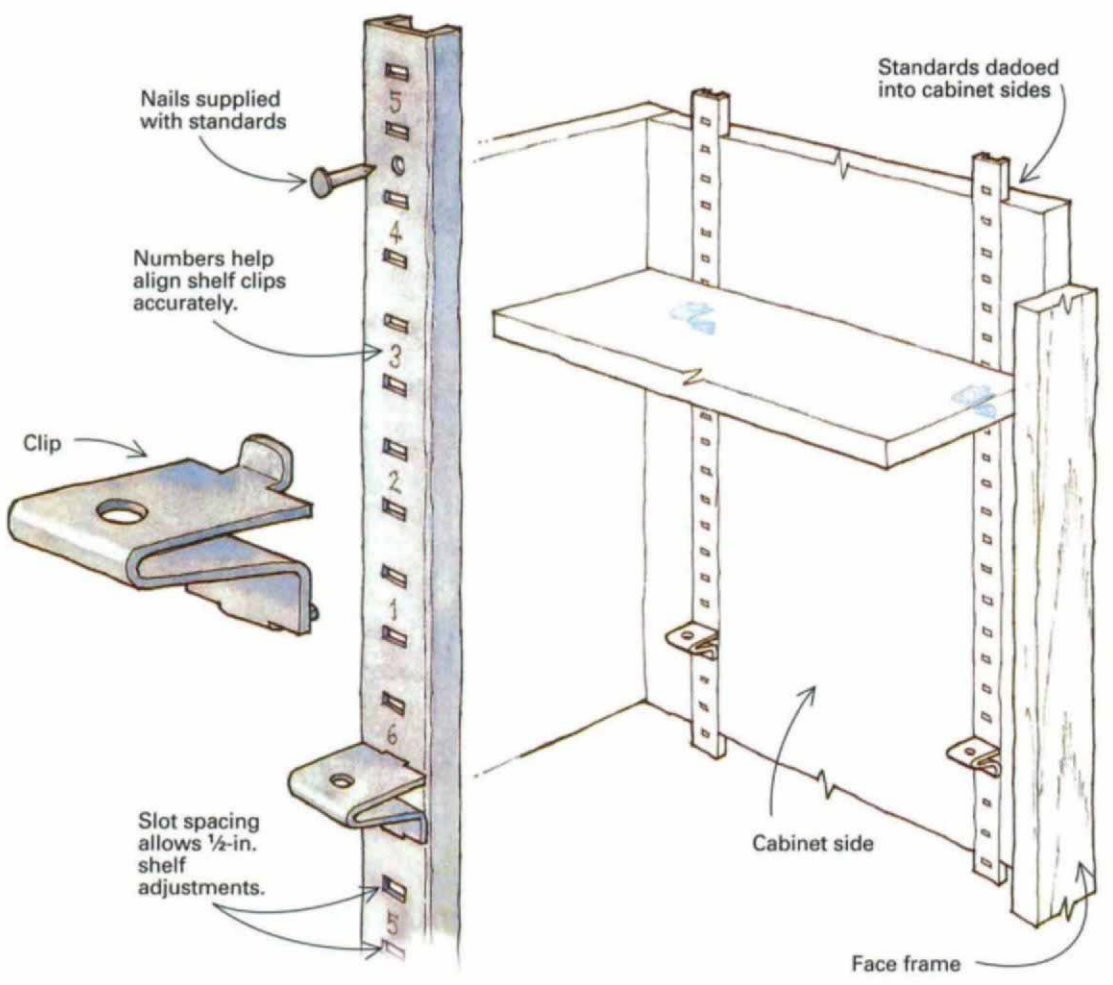
SHELF STANDARDS

Utility player: quick and simple

Shelf standards are the quickest, simplest way of installing adjustable shelving (see the drawing at right). They're not, however, the most attractive. Still, there are situations where they're the perfect solution, and they can be painted to match the cabinet. The spacing between holes for the clips is ½ in., so standards are the most adjustable of the methods I use.

To install the standards, I plow a dado ⅝ in. wide and 3/16 in. deep all the way from the top to the bottom of the cabinet sides. Then I assemble the cabinet, finish it and nail the standards in, paying attention to which end of the standard is up.

I nail the standards to the cabinet sides with the special nails that come with the standards. If cabinets are going to be placed next to each other, make sure they don't share a side (each case needs to have its own wall), or the nails will hit each other.



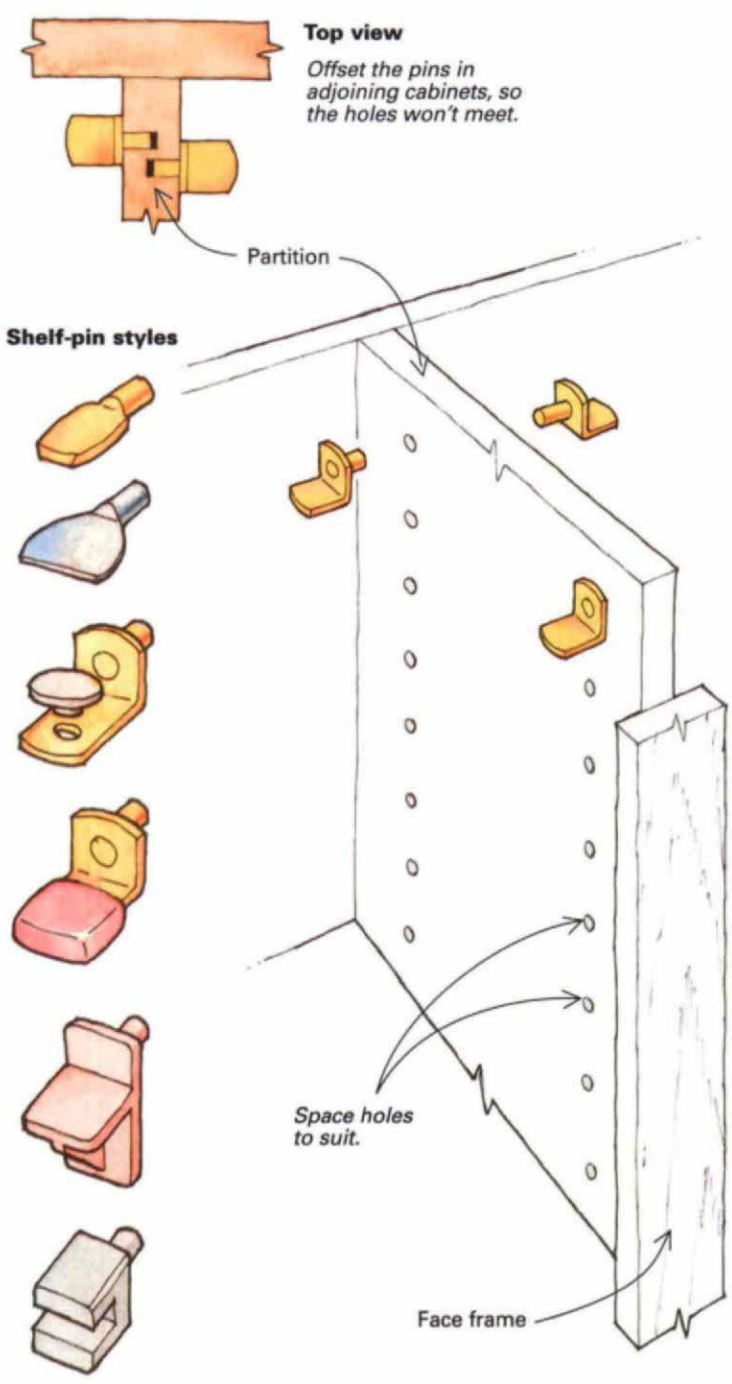
SHELF PINS

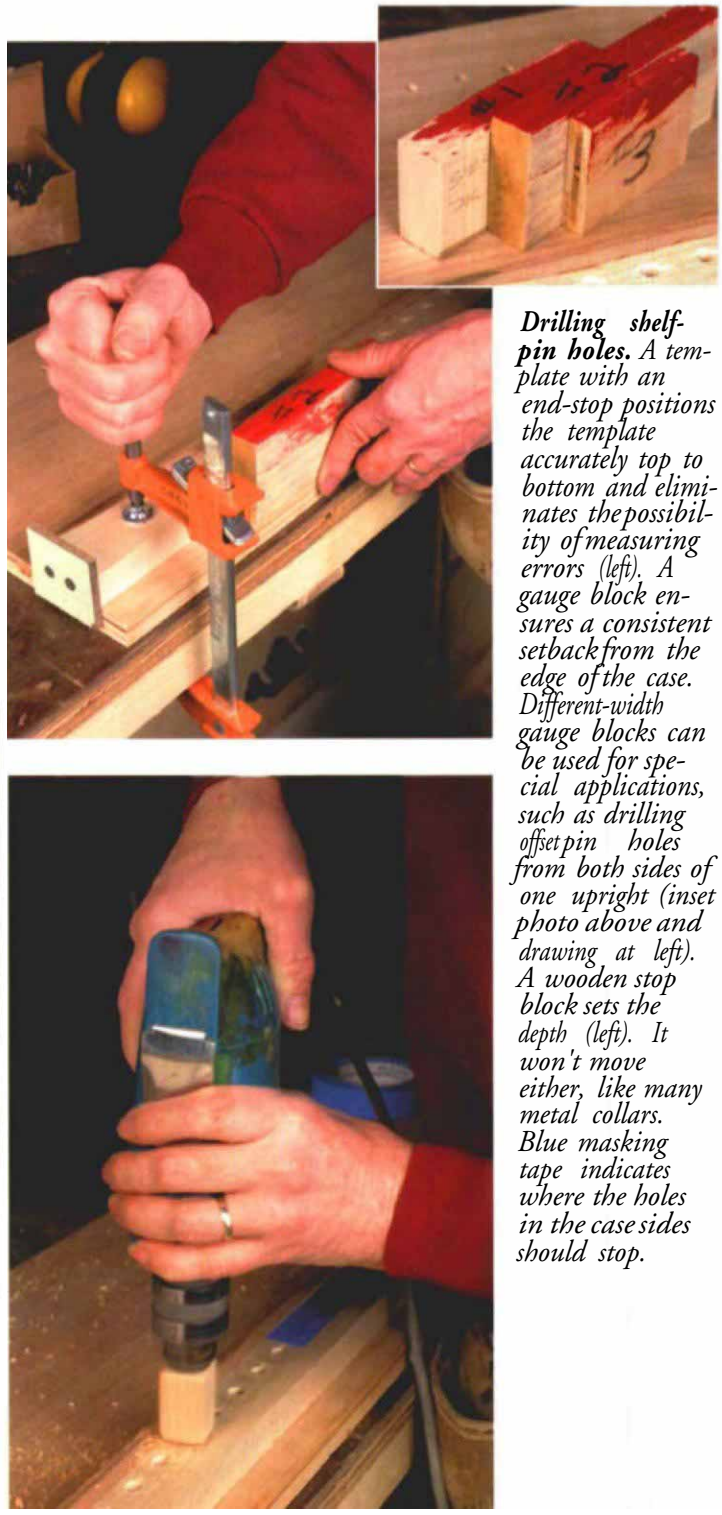
The old standby

I like shelf pins because they're quick and easy to install (see the photos below), very little hardware shows and, depending on how closely the holes are spaced, they're almost infinitely adjustable. Spacing the holes 1 in. on center works out about right. I also set the row of holes 1½ in. from the edges of the case sides. I drill the holes using a shopmade template before assembling the cabinet. I measure for the shelves after assembly.

Pins are available in a number of different shapes, sizes and materials, including plastic, plated steel and brass. You can even get pins with rubber cushions for use with glass shelving. The most common sizes are 5mm and ¼ in. And if you don't like the look of commercial pins, you can always whittle your own (see *FWW* #98, p. 65).

I don't need to drill holes all the way from the top to the bottom of the sides. I figure out the minimum and maximum spacing I'd like between shelves. Then I lay out lines on the case sides reflecting those parameters. For example, I never drill holes closer than 5 in. from the top or bottom of a case because a shelf that close generally wouldn't be useful.





Drilling shelf-pin holes. *A template with an end-stop positions the template accurately top to bottom and eliminates the possibility of measuring errors (left). A gauge block ensures a consistent setback from the edge of the case. Different-width gauge blocks can be used for special applications, such as drilling offset pin holes from both sides of one upright (inset photo above and drawing at left). A wooden stop block sets the depth (left). It won't move either, like many metal collars. Blue masking tape indicates where the holes in the case sides should stop.*

INVISIBLE WIRES

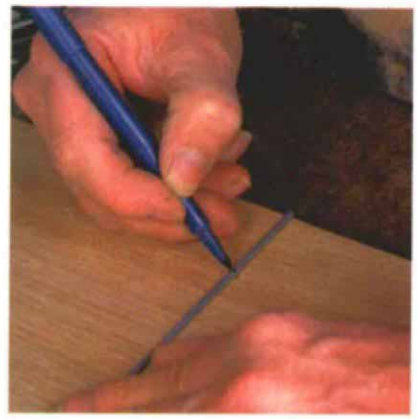
Great for contemporary cabinets

This method is pretty slick and looks great on more contemporary, frameless cabinetry. The only thing that will show on a cabinet with shelves supported by these "invisible" wires is a series of ⅛-in. holes. No hardware is visible at all. But because the shelves slide onto the wires, you can't use them on cabinets that have face frames (see the drawing below).

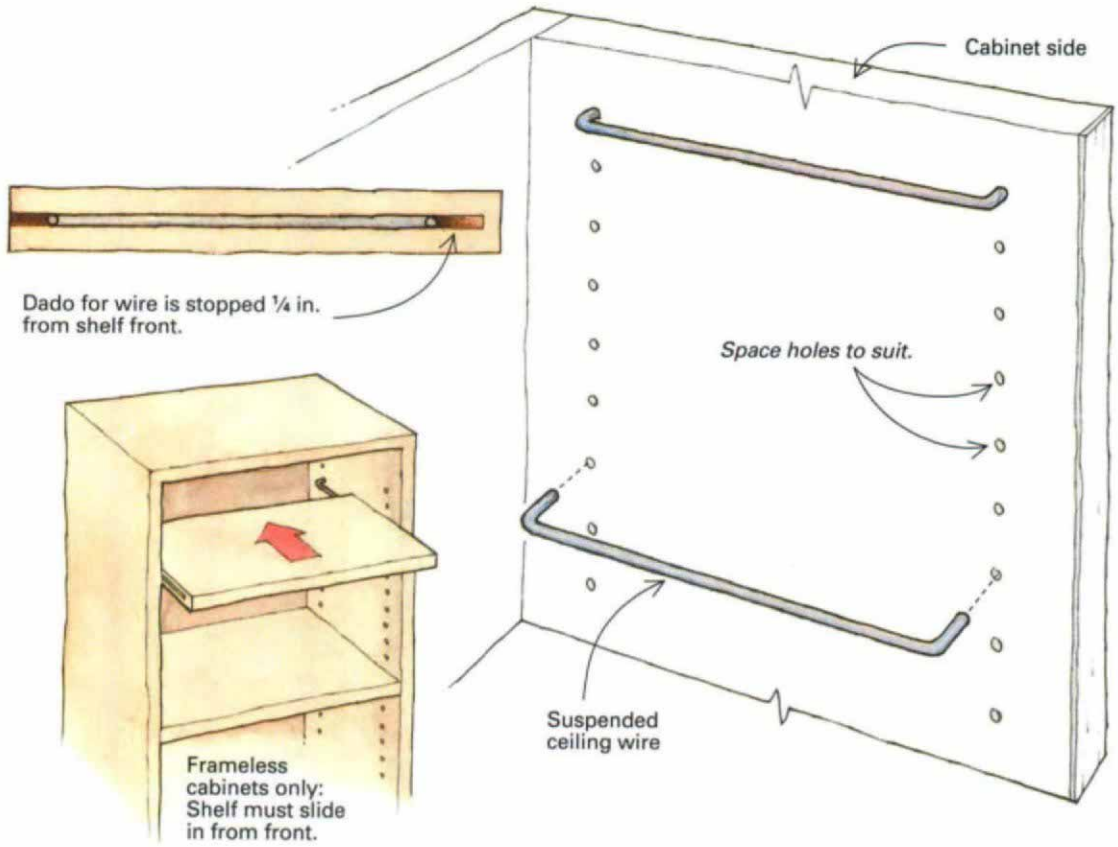
It's nearly as easy to cut, bend and install invisible wires as it is to install shelf pins. If I have a bunch of cabinets to do, I make a template, just as I do for shelf pins. If I only have a few to do, I use a marking gauge and a tape measure to lay out the hole centers.

I use suspended-ceiling wire (available from most home centers and large lumberyards) for the supports. It's about ⅛ in. dia., and a 10 ft. length costs less than $2. In a pinch, coat-hanger wire could be used. I measure the diameter of the wire with a caliper and then choose a bit to match. I also drill a test hole to make sure the wire fits snugly but not so tightly that it has to be pounded in.

I snip the wire to length with a pair of lineman's pliers and bend the wires in a vise. To get the wire to bend in the right place, I position it so the mark indicating the bend is just above the vise jaws. I bend it by hand first and then tap the corner flat with a hammer. Blind slots for the wires are cut in the ends of each shelf on the tablesaw but are stopped ¼ in. shy of the front edge of each shelf. I use a standard-kerf blade, but if you use a thin-kerf blade, just make two passes. The slots are centered on the ends of the shelves.



Installing wire supports. *Drill the holes about ⅝ in. deep (top left). Masking tape is an effective depth gauge. Cut the wire to length, and mark it for bending (top right). The wire should be as long as the distance between the holes plus 2½ in.—twice the depth of the holes and twice the amount of wire sticking out before it bends. To bend the wire, put it in the vise, push it over by hand and tap it flat with a hammer (bottom left). Check for consistency (bottom right). Wires should protrude about ⅝ in. from each hole. Trim if necessary.*



Photos: Vincent Laurence

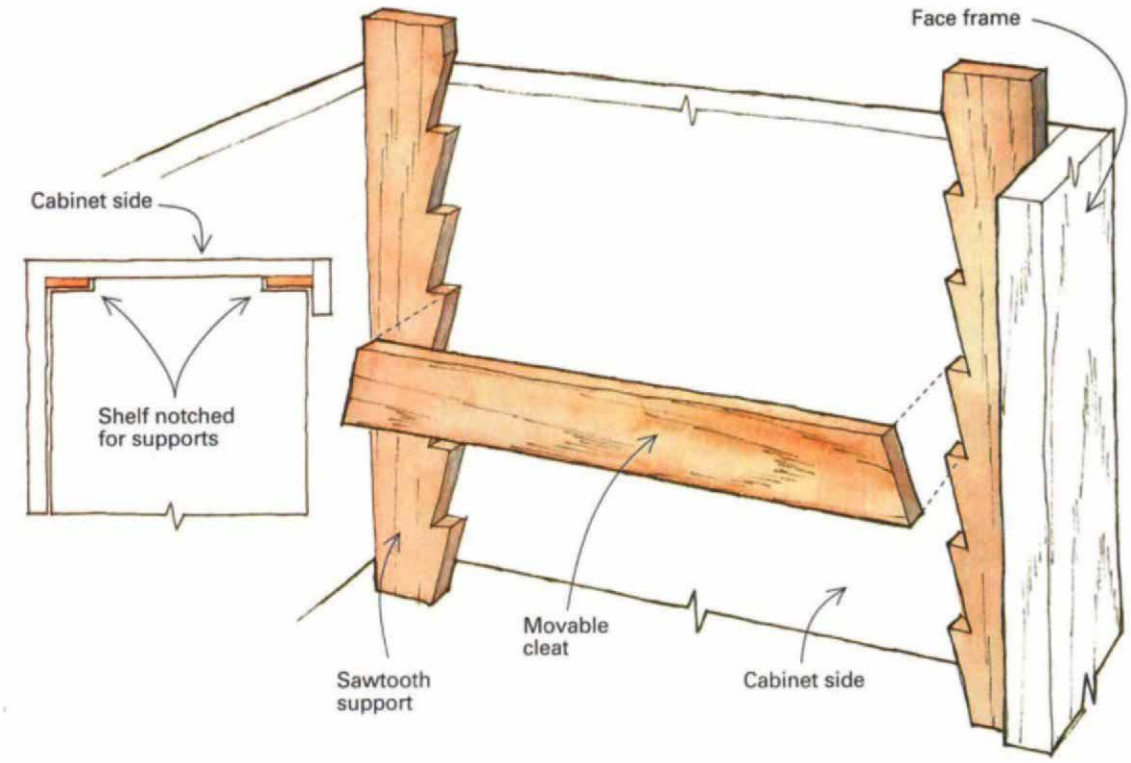
SAWTOOTH SUPPORTS

The most elegant supports

I've saved the best-looking shelf supports for last. They're not difficult to make—just a little time-consuming (see the photos below).

After milling stock for the sawtooth supports and the cleats that go between them (both are the same dimensions, about ⅜ in. to ½ in. thick and 1¼ in. wide), I mark the four uprights from a sawtooth pattern. Then I saw them out together on the radial-arm saw and the bandsaw.

I clean up sawmarks with a chisel and glue and nail the sawtoothed strips to the carcase sides at the front and rear. Cleats span the distance between supports; the shelves are notched around them.



Making sawtooth supports. *Mark out sawtooth patterns on the dimensioned stock (top left). A pattern made from ¼-in. hardboard speeds layout. Tape the four uprights together, and then tape the pattern to the stack to keep the pattern in place. Cut the straight part of the sawtooth on the radial-arm saw or tablesaw (top right). Bandsaw the angled part of the sawtooth (bottom left). Then pare the faces of the sawteeth smooth, and clean out the corners (bottom right).*