

Curved Doors

A design with a circular closet in the center of the house calls for some special techniques

by Thomas Duffy

Several years ago, I was hired to redesign a small, single-story house to accommodate a family of three. The bungalow had been chopped up into a number of little rooms, and the new owners wanted more convenience and openness. It was obvious from the start that storage was going to be a big problem in this 24-ft. by 28-ft. space, and I wanted to make use of spots that might otherwise be wasted.

I began by dividing the floor plan into quarters and drawing in corner cabinets, as shown in the drawing, below right. Then I sketched in the bathroom and a short hall to get to it, a process that transformed the four corner cabinets into a single discrete structure at the center of the house. This pushed me out on a limb. Putting major storage dead center in a house plan isn't exactly a standard design solution. But it occurred to me to play with the idea of round storage space in place of the square closets or shelves, and I liked the result. With the rest of the house still laid out with straight walls, curves at the center would give it a sense of depth and spaciousness that might be surprising and delightful in such a small space.

Getting down to design details, I decided that the closet would be 7 ft. in diameter, containing kitchen storage, a linen closet and a bedroom closet, a sliding door pocket and a bookcase. A short section of curved wall in the bathroom hall would be the arc of a 14-ft. dia. circle swung from the same center. I'd recently found a quantity of butternut at a good price. I had never worked with this wood; and was eager to give it a try. My clients liked the way it looked, so we decided that all of the woodwork in the

house would be butternut. As it turned out, the wood worked beautifully, and hand tools left it with a lovely, bright surface.

My crew's first job was to remove the existing partitions. Then, using trammel points, we traced the curve for the rough frame onto 2x12s. We bandsawed our top and bottom plates from this stock, and installed the top plate first, dropping plumb lines to locate the

position of the bottom plate. We toenailed in the radial 2x4 studs of the closet's exterior walls, and installed door headers and cripples.

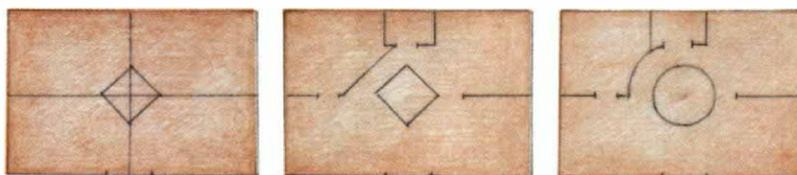
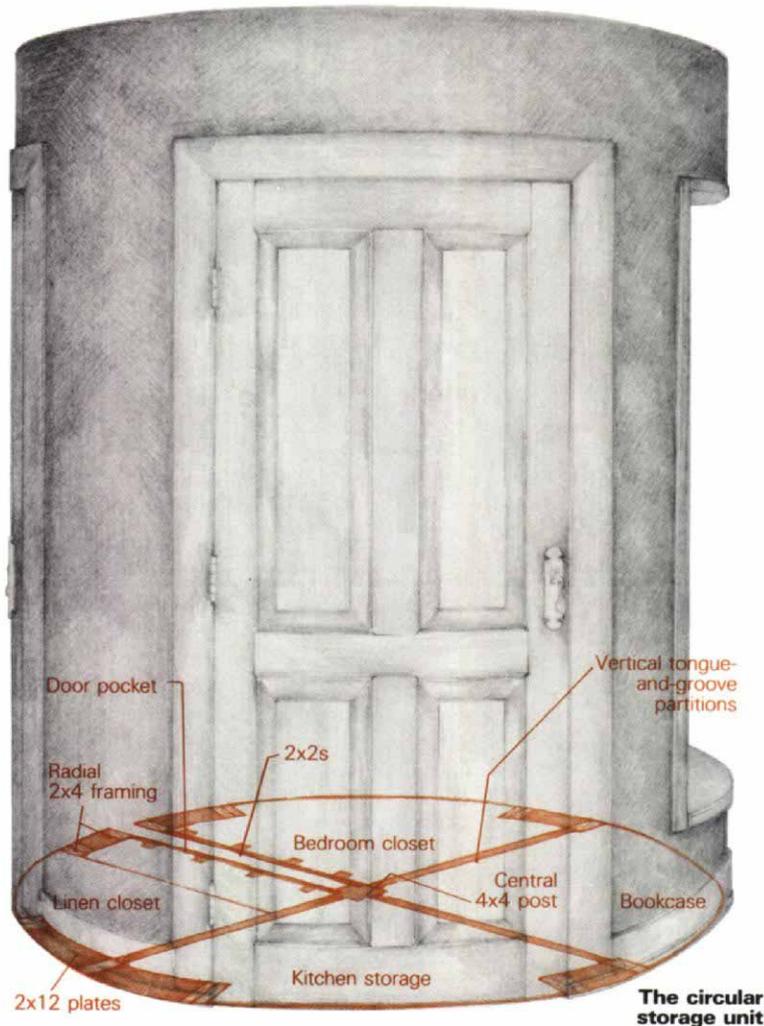
The door pocket was framed up out of 2x2s. Because of the curving surfaces, we decided to use plaster instead of drywall, so once the framing was done, we installed plaster grounds. These are 5-in. wide strips of wood that are nailed around the rough openings to be flush with the finished plaster surface. They look somewhat like casings, but are meant to act as guides or screeds while the wall is being plastered. They were removed and replaced with the actual casing after the plasterers and painters had finished their work.

Next, I installed the 4x4 center post, toenailing it to the subfloor below and to a nailer between the joists above. If the center post were taken out of the closet today, it might look like a crisp piece of sculpture, with all of the mortises, rabbets, notches and chamfers that were cut into it to accommodate the shelves, partitions and nailers.

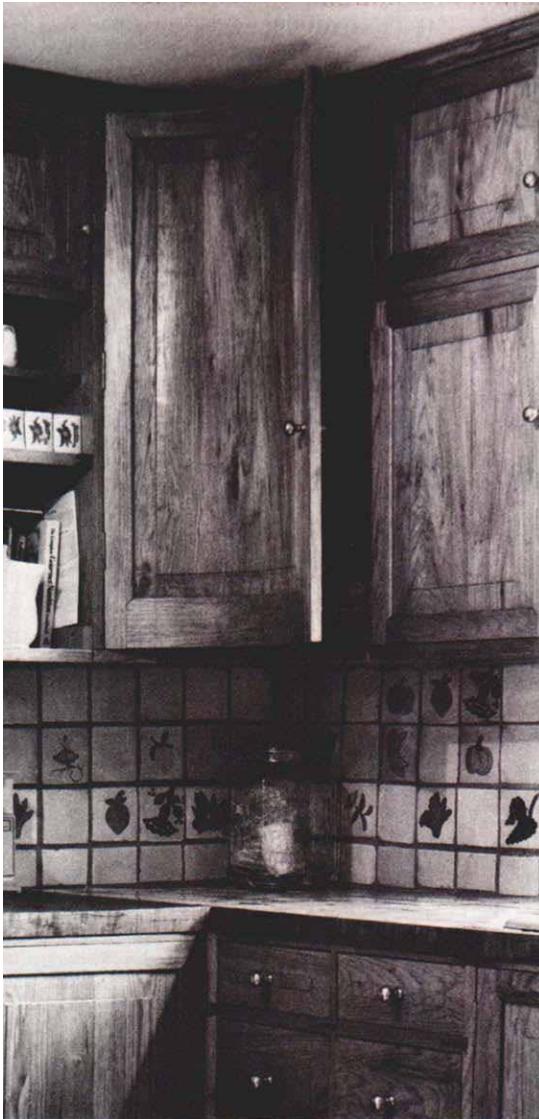
I used interlocking joinery for two reasons. The first is philosophical: I like to make a piece of wood do as much as it can. I'd rather cut mortises than apply more wood to do the job. The second reason is practical: Unglued

interlocking joints—dovetails, for example—can be taken apart and put back together again if any adjustments have to be made as the project unfolds.

I mortised horizontal shelf supports of 5/4 pine into the post, and toenailed their other ends to framing members. Then I nailed up vertical tongue-and-groove pine partitions between storage areas, and screwed cleats to the



Evolving the design. The author divided the bungalow into quadrants, with corner cabinets for storage (above left). Next, he sketched in the bathroom and a short hall (center). This left an unattractive freestanding closet in the center of the house. Duffy refined the idea of central storage to a circular closet and a curved hall (right).



partitions for the shelves, parts of which also had to be mated with the central post.

Making these doors was surprisingly easy. The three rails are the only bent sections, and the only differences from straightforward door-building are that you have to bend the rails, feather the flat panels slightly and adjust the layout so you can worry the joints between rails and stiles closed. These operations are shown in the drawings on the facing page.

The top and center rails of these doors are 5 in. wide, while the bottom rail is 7 in. wide. I made each rail of three ½-in. thick plies of butternut, each of which was steamed for an hour in a box and then bent over a form that I glued up out of boards cut to the proper curve. I used winding sticks to make sure that the form curved smoothly without any twist (drawing A).

I left the middle ply a couple of inches long on each end so I would have ready-made tenons. I also cut the center ply ½ in. narrower than the outside plies on the top and bottom rails. When the rails are glued in place, its narrow width forms a groove to hold the panels. The center rail needs grooves to accept panels on both sides, so I left the middle ply a full inch narrower than the outer ones. In the center of each middle ply, I also cut a notch 1 ½ in. deep and big enough to accept a stile. When the rails were glued up, this notch became a mortise for the center stile (drawing B). The butternut was roughsawn, so I cleaned up the field of the panels and roughed out the bevels with a scrub plane, a plane with a convex iron that will remove a lot of stock very fast. Then I jack-planed the field, which left a lovely surface, and finished raising the panels with a panel plane. The doors' stiles were cut slightly thicker and wider than their finished dimensions would be so that I could properly locate their grooves and then plane them to conform to the curve of the rails, and to fit the jamb exactly. I built the jambs in my shop and prehung the doors there.

More curves—There were two other curved elements in the woodwork I did for the house: the concave corner cabinet in the kitchen and the circular bathroom vanity (photos at left). Both of them required tighter bends than the doors, and no amount of feathering would have made flat panels fit. I had to fabricate curved panels as well as curved rails. To do this, I built a cradle out of ¾-in. plywood and 2x2s that established the right curvature (drawing C). Then I laid up 1x3 strips of butternut, after determining the appropriate bevel angle for their edges, as the drawing shows. I cut the bevels on the table saw. The bevel on each strip needed some work with a plane so that it would fit tightly next to its neighbor, stave-fashion. Once the curve looked smooth, I glued the strips together. This work took a lot of time and pa-

More curved built-ins. The curve became a unifying element in the remodeled bungalow. The kitchen corner cabinet (above left) and the bathroom vanity (left) are variations on the theme. Unlike the doors of the large circular closet, which have curved rails and flat panels, the corner cabinet and vanity have curved panels as well, because of their small radius.

Making and joining the rails and panels. The rails of the curved doors are glued up from three ½-in. plies, steamed and bent over a form (drawing A, facing page). The middle plies are cut long, leaving ready-made tenons for joining the rails to the stiles. They are also ripped narrower than the outer plies, and are positioned to form grooves for the panels to ride in. The middle ply of the center rail is ripped extra narrow to accommodate both top and bottom panels. Notches in the middle plies create mortises for the center stiles (B).

Gently curving doors don't require curved panels. Flat panels are simply feathered to fit their grooves. The curved panels of tightly curving doors were assembled on a specially fabricated cradle (C).

tience, and I did a lot of dry-fitting before I got everything to mate. I cleaned up the surfaces of the curved panels with scrub and compass planes, and raised the panels, which were still in the cradle, with the panel plane along the grain, and a small-radius gouge and chisels on the curved ends.

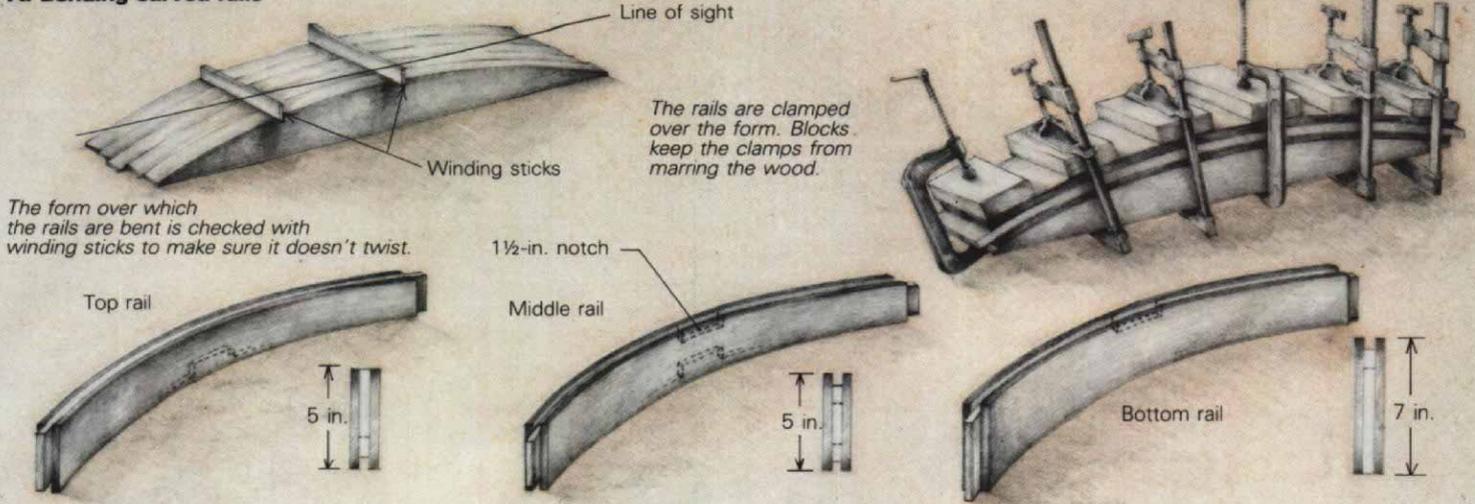
While I was working on this house with its beautiful wood and admittedly unusual design, I felt a strong pull toward what I call quirky work, the eccentric tour de force that all too often has no practical purpose. My temptations led to some reflection on the role of craftsmanship. I began to take a fresh look at my ideas about moldings. I have no formal training in either design or woodworking, but it was clear to me that changes in plan or elevation are not to be taken lightly. I began to wonder about all this graceful static that Chippendale and his friends were so fond of. Was there something to hide? Did the wealthy need a performance every time a horizontal met a vertical? Did they need to avoid recognition of a change? What is this blur in the corners?

I concluded that the best work shows tasteful restraint. Consider the Gamble house by Greene and Greene. For my money, its magnificence is diminished by the extreme amount of thought and action devoted to every feature. No surface was left alone, no plane unaltered. Even rafter ends and door stiles make powerful statements. The house is loved for its honesty, and rightly so, but it is a bullying honesty. I decided on subtle, spare decoration where I wanted any decoration at all. For instance, along the edges of the doors' stiles and rails, I cut a simple bead, which I think makes each panel look less like a picture in a frame, and also results in a gentle play of light and shadow that adds to the warmth of the house.

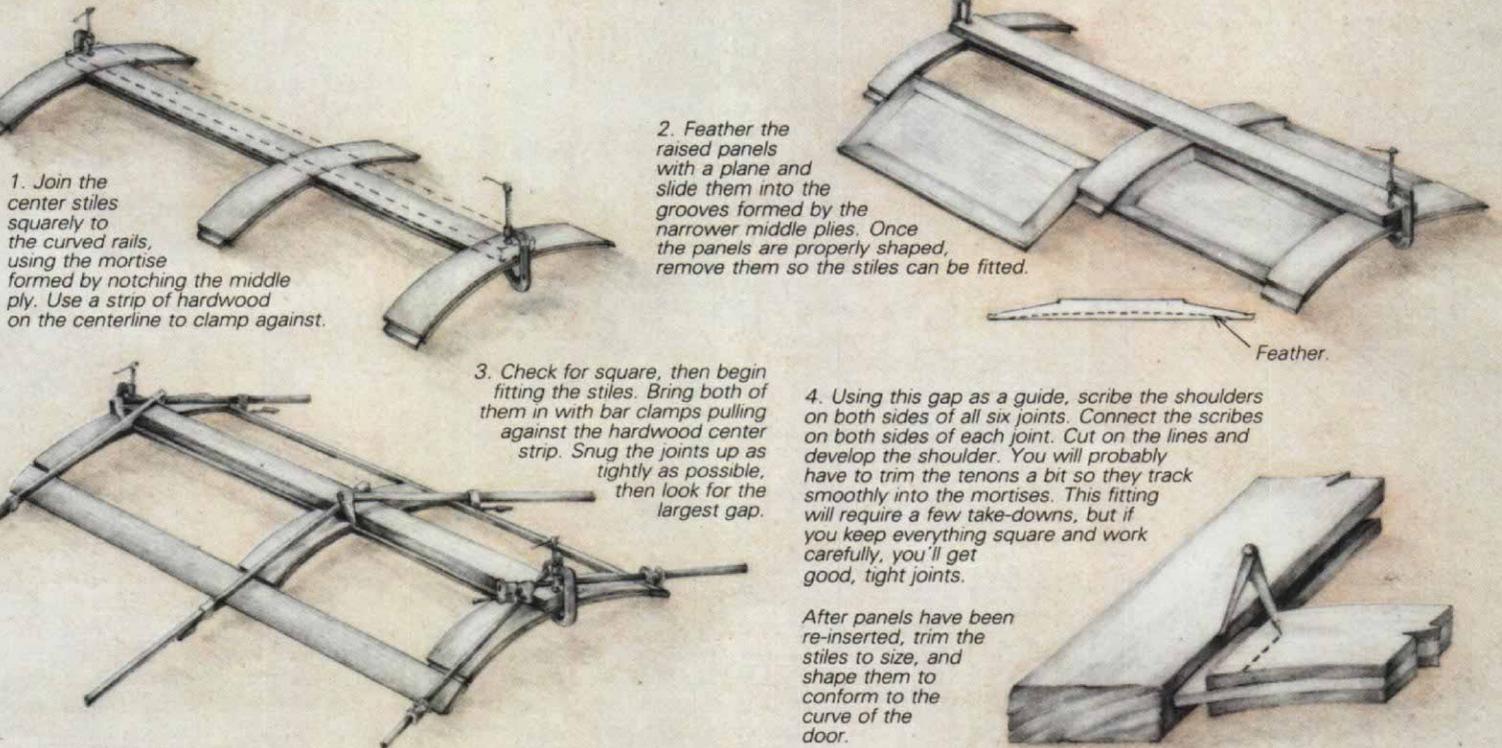
This job also taught me that you don't need vast spaces to create an interesting design. In fact, I think that a small room or house offers greater possibilities for good design, because there's no space to waste. By introducing angles or curves and by paying attention to details and craftsmanship, you can create a jewel-like richness and a space that feels much larger than it really is. I'm happy that the very center of this little house turned out to be the best place for storage. □

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A. Bending curved rails



B. Assembling a curved door with flat panels



C. Assembling a curved panel

