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Outdoor Projects

Step-by-step plans for the yard and garden

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Outdoor Projects – Spring 2021
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introduction

TIME FOR A LITTLE FRESH AIR

If the events of the past year have taught us anything, it's the value of spending time outdoors with family and friends. And where better to do that than in your own yard? *Outdoor Projects* is a collection of tables, chairs, benches, garden projects, and container gardening how-to that is guaranteed to enhance your time spent outside.

We've gathered the best outdoor projects from the pages of *Fine Woodworking*, *Fine Homebuilding*, and *Fine Gardening* magazines and put them together here. Whether you're looking to make raised garden beds to make your vegetable garden more accessible, a potting bench to provide a great surface on which to work on your plants, an arbor to sit under, or a beautiful garden gate, you'll find it here.

In addition, there's a collection of excellent projects for those who aspire to make their own outdoor furniture: a fresh take on the classic Adirondack chair, an easy modern chair, several attractive benches, and a rustic table decorated with twigs. You can make a doormat, or combine seating with gardening in a planter/bench combo.

When you've filled your outdoor space with plenty of great furnishings and garden enhancements, you can add a finishing touch: beautiful containers full of plants. The experts from *Fine Gardening* show you how to put together a variety of container gardens, with tips on what plants work best in each situation.

We hope *Outdoor Projects* brings you enjoyment, and that you use it to turn your backyard into a space for entertainment, gardening, and simple relaxation.

Fine WoodWorking®

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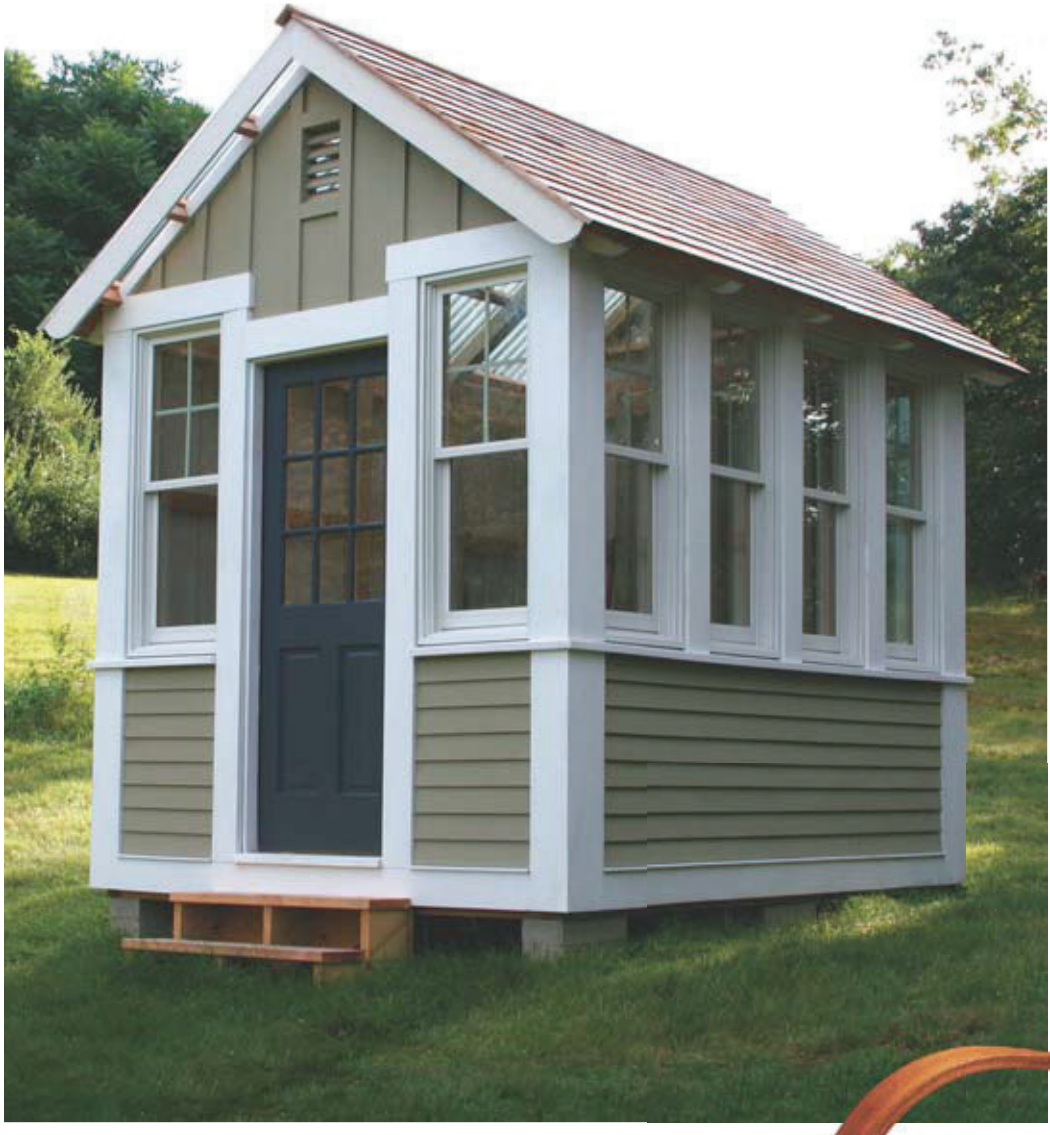


VIDEO

A different kind of shed

Fine Gardening asked the experts at Fine Homebuilding to design and build a garden shed that was a little different. In this multi-part video series, we demonstrate the phases of construction for a unique backyard shed project.

VIDEO

Footings for decks

From digging to forming to pouring, this video shows that deck footings can be mastered in a minute.

VIDEO

Why I build: Jane DeWitt

What inspires this mason to make beautiful things that last? It's the contrast of a hard day's effort and an evening's rest. It's working outside amid the unfolding of the seasons. It's both the process and the people.

VIDEO WORKSHOP

Graceful curves for your garden

Wood-bending wizard Michael Fortune deconstructs the classic Adirondack chair to deliver an updated design full of beautiful curves. In this eight-part, members-only Fine Woodworking series, Fortune demonstrates a variety of techniques, including how to:

- Build strong forms for bent laminations
- Resaw thin plies for bending
- Trim and shape tricky curved components

quick tips

An easy, inexpensive birdbath

We had lost too many ceramic birdbath bowls to curious squirrels and thirsty raccoons, so I wanted to figure out a more stable solution. The first experiment was a success—a large clay pot base with a matching plastic saucer that fits snugly inside the top edge of the pot. It blends well with all the other clay pots filled with flowers throughout the garden. I could have stacked two pots if I wanted it to be taller. I could upgrade to a nicer ceramic pot and a fancier clay saucer, but the birds seem quite happy with this arrangement.

— BARBARA DOWNING OWEN, Wellesley, Mass.

Revive rusty tools

Old or neglected tools can be brought back to life with proper care. To remove rust from my garage or estate-sale finds, I use a pliable rubber sanding block that securely holds a strip of sandpaper. The 3M sanding block that I use is sturdy and comfortable to hold, and it can be found in the automotive section of your local hardware store or in any marine-supply store.

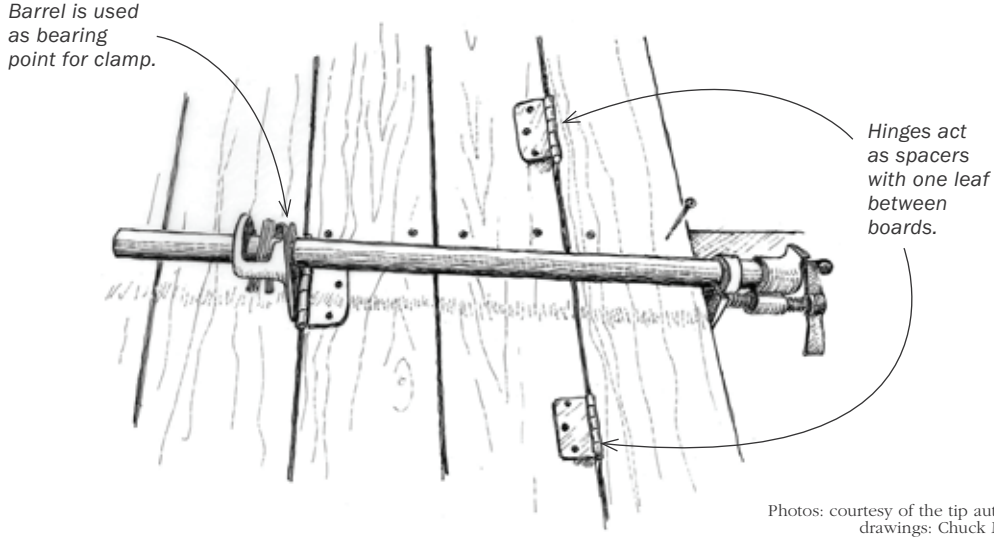
Most old tools need only a gentle scour to reveal the original steel and a quick wipe of linseed oil for future protection.

—LESLIE NIIYA, Beaverton, Ore.

Deck spacers

When installing new deck boards, we used 3½-in. door hinges as spacers. We inserted one leaf of the hinge between boards to gap them, and used the barrel of another hinge as a bearing point to pull things tight with a pipe clamp. For wider spacing, we could have just inserted both leaves.

—PETER OQVIST, San Rafael, Calif.



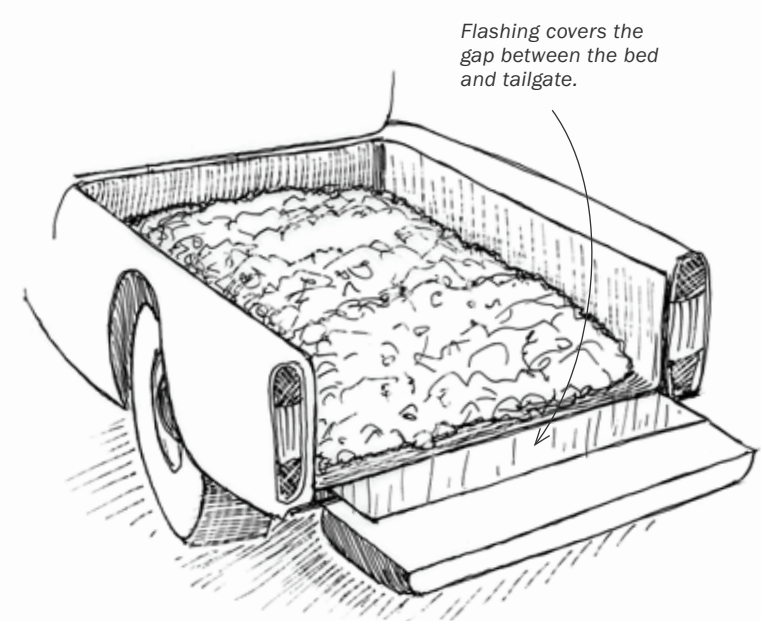
Photos: courtesy of the tip authors; drawings: Chuck Miller

Tailgate gravel shield

I occasionally need to haul a load of gravel in my pickup, and when it's time to unload the stuff, some of it inevitably gets caught in the gap between the open tailgate and the truck bed. If I'm not careful to clean it out, the stuck bits of gravel eventually chip the paint and even dent the metal.

As shown in the drawing, I minimize the trapped-gravel problem with a length of aluminum coil-stock flashing. I store the flashing under the bed liner until needed.

—CLYDE KENNEDY, Rushville, Ohio



Mount your hose hanger higher

When I had to reinstall a hose hanger recently, I decided to raise the bar. I doubled the original height (see old screw holes in photo), attaching it at chest level. This new hose-hanging height makes a big difference. It is very ergonomic—no more stooping! And there are half as many loops and fewer kinks when it's time to put the hose away.

—LYNNE NATHAN, New Paltz, N.Y.

How does your garden glow?

CREATIVE USE OF CANDLES PUTS YOUR OUTDOOR SPACE IN A DIFFERENT LIGHT

BY MICHELLE GERVAIS

I once arrived at a friend's house for an outdoor garden party to find a large, frosted glass globe balanced on three rocks at the entrance to the walkway. A tea candle placed inside the globe set it aglow. The effect was spectacular and added to the evening's charm. Since that night, I've experimented with a number of ways to add candlelight to my garden. Many materials from around the house can be turned into receptacles for candles. With the addition of the subtle effects that candlelight can add to your garden, you'll discover that your garden's beauty can be enjoyed long after the sun has set.

Michelle Gervais is a former senior editor at Fine Gardening.

MILK GLASS GLOWS WITH SUBTLE CHARM

Milk-glass vases, which once commonly came with flowers from the florist, are now inexpensive finds at tag sales and thrift stores. With votive candles inside, they provide beautiful, diffused light. Milk-glass teacups are great, too. Perfect for little spots of light in out-of-the-way nooks, these charmers add an understated glow to the evening.

LEAF-WRAPPED GLASSES ARE TEMPORARY BUT FUN

Take a broad leaf, like one from a sycamore or hosta, and embellish it with a few smaller leaves, such as those from a Japanese maple or yew. Then tie the arrangement with raffia twine around a straight-sided glass. A lighted tea candle inside will show off the structure of the leaves. They'll dry out in a few hours but will still look beautiful.

ICE CANDLES ARE PERFECT FOR SUMMER EVENINGS

For a cool glow on a hot summer night, make an "ice bucket" by nesting a small, plastic container into a larger container filled with water, securing it with tape, and leaving it in the freezer overnight. Remove the containers and place a votive candle inside. The slowly melting ice changes the intensity and pattern of the light throughout the evening.

Photos: staff

HANGING JARS GLISTEN FROM ABOVE

Instead of recycling your glass jars, reuse them by hanging them from arbors and branches. Knot some twine tightly under the edge of the rim of a jar, leaving long, trailing ends on either side to tie the jar to a beam, tree branch, or other support. Then pop in a tea candle. This is an inexpensive way to create a canopy of lights in a large area. After you blow out the candles, put the lids back on to keep the jars from filling with rainwater.

PAPER-WRAPPED CANDLES CREATE PILLARS OF LIGHT

To construct glowing towers that can guide visitors down a path, tape vellum paper around pillar candles. Plain paper works, too, but vellum paper (available at stationery or craft stores) is stiffer and more translucent. Although it looks as if the paper could catch fire, I've burned these candles for up to five hours in a light breeze without a flicker.

LAMP GLOBES GENERATE A SPHERE OF SOFT LIGHT

The globes from old light fixtures can be balanced on pedestals or rocks to create a soft, glowing ball of light. Face the opening out of sight, and slide in a lighted tea candle. You can also hang small globes from low-lying branches for a more polished look than a canopy of jars.

One Pot, One Plant

These bold, simple pots of Dragon Wing® Red begonias accent, rather than distract from, the matching front door.

Photos, except where noted: staff

Proportion, color, and shape are all important when highlighting a solo performer

BY JUNE HUTSON

Contrary to the reliable strategy of using a plethora of plants in a single container, one plant in a pot can really shine. Placing just one plant in an urn or container enables it to achieve its full potential in size and vigor, which would be compromised if it were competing with other plants for space, light, and nutrients. Many plants with unique attributes can attract attention when standing alone. Consider the structure of shrubs like hydrangeas, which enjoy stretching out their branches in every direction, or plants like New Guinea impatiens with their tightly rounded habits. Planted singly in a container, these plants can impart a dramatic impact wherever they are displayed.

Choose plants for maximum impact

In a container that has many different plants, a failure is easy to hide. If one plant doesn't live up to its potential, the other plants can compensate and the container will still look presentable. If the pot has just one member, it had better be a good one. When searching for a perfect plant to fill a pot, look for long-lasting, attractive foliage; exceptional form; and perhaps an added bonus, like a long bloom period.

Cannas (*Canna* spp. and cvs., USDA Hardiness Zones 8–11) are a good example of plants to grow on their own. Beautiful but needy, they do not share water and nutrients well with pot mates. Large cultivars, such as 'Australia' or 'Pretoria', develop their rhizomes quickly, even in a container. They need all of the space a pot has to offer to produce their numerous stems of abundant flowers. Together with their bold leaves, they make a dramatic statement.

Like cannas, most shrubs grown in confined quarters need the entire soil mass of a pot to grow and produce flowers. Vigorous shrubs, such as butterfly bushes (*Buddleia davidii** and cvs., Zones 5–9), are much better grown alone in a pot as they quickly develop a mass of shoots and roots. Hydrangeas (*Hydrangea* spp. and cvs., Zones 4–9) exhibit a rounded form that looks better displayed alone.

The hardiness of a woody plant for a container is an important issue. Unless I know that I can move

The intriguing foliage of this coleus* (Solenostemon scutellarioides *'Fire Dragon', annual) commands full attention when displayed alone in a pot.

**This species may be considered invasive in some areas. For more information, go to invasiveplantatlas.org.*

Matching a plant to its pot

It's easy to get caught up in standard design rules, but the truth is that you can match almost any plant shape with almost any pot shape as long as the scale is balanced. When a container suits its occupant, and vice versa, it just looks right. A plant's size usually dictates the size of the pot, but the shape of the pot is up to you. Experimentation and experience will increase your confidence and enjoyment when choosing just the right container for a cohesive partnership.

A TALL, NARROW POT ▶

If a plant has a strong vertical habit, the look is intensified when put in a tall, narrow pot. A plant with a rounded habit placed in a tall pot may take on the appearance of a cone with a big scoop of ice cream on top.

A SHORT, SQUAT POT ▶

When a short, rounded pot is used for a plant with a strong vertical habit, it looks like it is anchored to the ground.

A MEDIUM-SIZE POT ▶

If the container is about the proportion of the expected mature size of the plant within, the combined shapes take on the look of a balanced composition.

a container into a greenhouse or dig the shrub out of the pot for the winter, I always choose shrubs that are a zone hardier than recommended for my climate. Ideally, shrubs or trees are best moved to a spot close to a house or building, preferably on the east side so that they're sheltered from winter winds. You can pile the area around the pot with straw to provide an even cozier environment. It's also important that the pots you choose are made of materials that are resistant to winter damage, such as concrete, wood, resin, or plastic.

The restricted root area of a pot keeps some plants small, so the range of material for specimen plantings can be broadened to include plants that would grow larger in the ground. This is most evident when using ornamental grasses, shrubs, and trees. Ornamental grasses quickly become spectacular specimens in containers. Their inflorescences add grace and movement to the garden. Grasses such as 'Northwind' switchgrass, with its tall, blue foliage, mature to a smaller height when in pots. Fountain grasses perform well when confined, and they can remain outdoors for fall and into winter, giving you three seasons of interest. Shrubs such as 'Red Sprite' winterberry (*Ilex verticillata* 'Red Sprite', Zones 5–8), redtwig dogwoods (*Cornus alba* and cvs., Zones 2–8), and red osier dogwoods fill out a container nicely. They take a back seat to more colorful specimens during the summer, but in winter, they light up dreary days with colorful berries or stems.

Many annuals and perennials are good to grow singularly in pots, as well. Annual impatiens quickly form a nicely rounded mound, bloom nonstop all summer, and

When planted in their own pots, plants can be moved around and arranged on a whim. This sedum and fountain grass make a pleasing pair in a courtyard.

Photo, opposite: Jennifer Brown

*The bold forms and textures of cacti and succulents are a perfect match for one-plant pots. Here, an urn of echeveria (*Echeveria *sp., Zones 10–11) rises above globes of barrel cactus (*Ferocactus *sp., not hardy below Zone 11) and a spiky mescal (*Agave parryi, *Zones 9–11).*

The wide, mounded forms of some plants, such as this 'Sum and Substance' hosta (above) and blue anise sage (below), combine well with large, wide pots.

A cobalt blue pot complements the azure blooms of Cape leadwort.

can be grown in sun or shade. Dragon Wing® Red begonia is one of the ultimate plants for a container. Its shiny foliage fills in quickly, and it blooms nonstop. It gets large by the end of the growing season, so a medium-size to large pot works best. Umbrella plant is great for a pot without a drainage hole because it needs constant moisture; it also adds an exotic look to any location. Perennials like 'Sum and Substance' hosta (top photo, left) and 'Golden Sculpture' hosta add bold drama to a shady patio with their chartreuse foliage.

Things to consider when matching a plant to a pot

Let the colors of both plants and pots help dictate your design. I particularly like the jewel colors of glazed ceramic pots as they can be a contrast to plants or an extension of the same hue. One of my favorite color-harmony combos is Cape leadwort in a blue pot (right photo, above). The plant's exuberant stems reach out in all directions, creating a tumble of blue flowers that mimic the same azure shade of the ceramic container in which it is planted. Cape leadwort's wild form engulfs the pot just enough to create a living sculpture. A similar pairing is a short, dark purple pot planted with purple shamrock (*Oxalis regnellii* var. *atropurpurea*, Zones 7–10). The pairing of the shiny container surface with the sheen of the triangular purple leaves is outstanding. Another example is the reddish hue of a terra-cotta pot that serves as an anchor to the ground but becomes more of a focal point when combined with the rustic colors of 'Autumn Joy' sedum (Zones 3–11). To capitalize on contrast, forest green ceramic containers are stunning when planted with anything orange or red, such as a red-flowering annual tobacco (*Nicotiana alata* 'Nicki Red').

Photo (top right), June Hutson; opposite (center right): Colleen Fitzpatrick

25 GREAT PLANTS for one-plant pots

Here are some of Hutson's favorite specimens for one-plant pots.

ANNUALS AND TENDER PERENNIALS

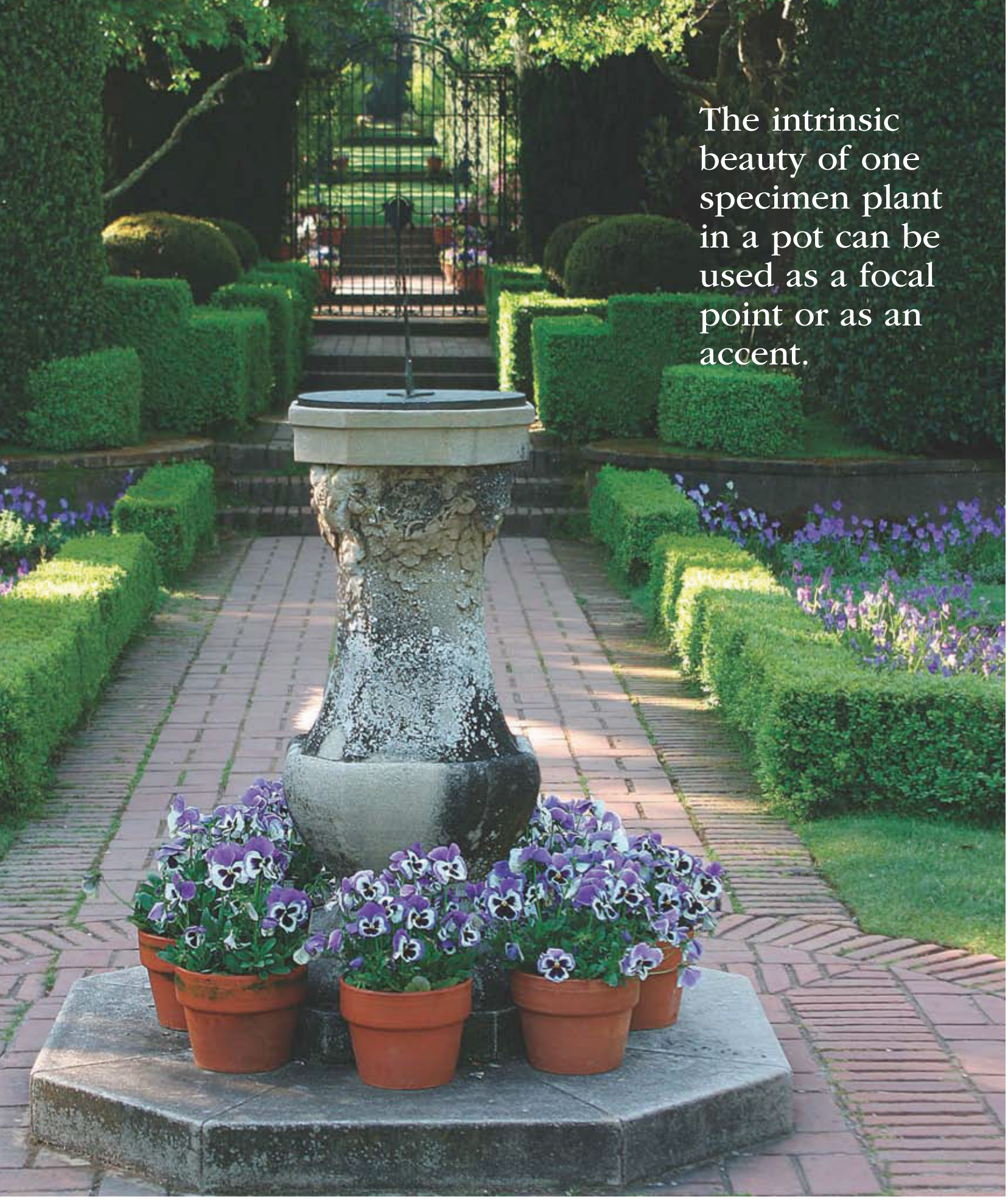
1. Blue anise sage (*Salvia guaranitica* 'Black and Blue', Zones 7–10)
2. Cape leadwort (*Plumbago auriculata*, Z 9–11)
3. Chile pepper (*Capsicum annuum* cvs., annual)
4. Dragon Wing® Red begonia (*Begonia* Dragon Wing® Red, Z 11)
5. Elephant's ear (*Colocasia esculenta** and cvs., Z 8–11)
6. Fiber optic grass (*Isolepis cernua*, Z 8–10)
7. Flowering maple (*Abutilon* spp. and cvs., Z 8–11)
8. Impatiens (*Impatiens* spp. and cvs., annual)
9. Profusion Series zinnia (*Zinnia* Profusion Series, annual)
10. Tropical smoke bush (*Euphorbia cotinifolia*, Z 9–11)
11. Umbrella plant (*Cyperus alternifolius*, Z 9–11)

PERENNIALS AND GRASSES

12. Anise hyssop (*Agastache foeniculum* and cvs., Z 4–11)
13. Black-eyed Susan (*Rudbeckia hirta* and cvs., Z 3–7)
14. Fountain grass (*Pennisetum alopecuroides* and cvs., Z 6–9)
15. 'Gateway' Joe Pye weed (*Eupatorium maculatum* 'Gateway', Z 5–11)
16. Hosta (*Hosta* spp. and cvs., Z 3–9)
17. 'Rozanne' hardy geranium (*Geranium* 'Rozanne', Z 5–8)
18. Sedum (*Sedum* spp. and cvs., Z 3–9)
19. Switchgrass (*Panicum virgatum* and cvs., Z 5–9)

TREES AND SHRUBS

20. Bigleaf hydrangea (*Hydrangea macrophylla* cvs., Z 6–9)
21. Fastigiate hornbeam (*Carpinus betulus* 'Fastigiata', Z 4–8)
22. 'Foxtail' Colorado spruce (*Picea pungens* 'Foxtail', Z 2–8)
23. Mugo pine (*Pinus mugo* and cvs., Z 3–7)
24. Red osier dogwood (*Cornus stolonifera* and cvs., Z 3–8)
25. Small-leaved boxwood (*Buxus microphylla* and cvs., Z 6–9)



The intrinsic beauty of one specimen plant in a pot can be used as a focal point or as an accent.

*One-plant pots can make a bold statement in a garden and, when used in multiples, can frame an entryway or architectural element. Here, matching pots of tulips (*Tulipa *spp. and cvs., Zones 4–8) flank a stately bench in a formal garden (right), while seasonal pots of pansies (*Viola 3 wittrockiana *cv., Zones 8–11) adorn a sundial pedestal (opposite).*

Another factor to consider when designing a one-plant pot is pairing the size and proportion of a plant with a complementary pot. In general, plants with a rounded habit are successfully paired with pots of low, chubby proportions. Blue anise sage, a great hummingbird plant, has an overall rounded form that looks stunning in a squat pot. The vertical effect of a larger, more upright pot can be enhanced by pairing it with a similarly shaped plant, such as a tropical smoke bush, cannas, upright coleus, or grasses. Top a small, narrow pot with a spiky hat by choosing a plant such as fiber optic grass or an agave (*Agave* spp. and cvs., Zones 9–11). The same look can be achieved with a larger narrow pot using a fountain grass. Ornate, flaring urns benefit from the blowsy habit of shrubs such as hydrangeas or flowering maples, which add Victorian charm to a cottage-garden setting. Draping ferns, such as foxtail fern (*Asparagus densiflorus** 'Myersii', Zones 9–11), also work well.

Use one-plant pots in several ways

The intrinsic beauty of one specimen plant in a pot can be used as a focal point or as an accent, leading the eye to a direction or destination wherever the container is placed. For example, a parterre garden with symmetrical beds can be connected into a whole by directing the eye to a single-plant container in the center of the garden. And a series of containers placed by a doorway directs a visitor to the point of entry. Pots placed along a garden walk draw you forward, perhaps to discover that the path continues on to a farther destination.

The design of a one-plant pot can sometimes be determined by the intended placement of the container. Scale is a strong criterion. A large ornamental grass complements an expansive hardscape area, such as a patio. Repetition of that same planting can create a vertical accent along a fence, which moves the eye along like a bouncing ball, giving it direction. Using a matched pair of conifers at a doorway provides symmetry and adds a sense of permanence, with the added benefit of being able to decorate the plants with lights for the holidays. If the entry is not obvious, the containers can help point the way.

Many plants have such strong individual attributes that a true appreciation of them and their singular beauty can only be fully appreciated by featuring them in a pot all their own. Simplicity is often a surefire recipe for success. □

June Hutson is supervisor of the Kemper Home Demonstration Gardens at the Missouri Botanical Garden.

One Pot, Lots of Plants

For a lush look, pick the right plants and don't be afraid to pack 'em in

BY JUANITA NYE

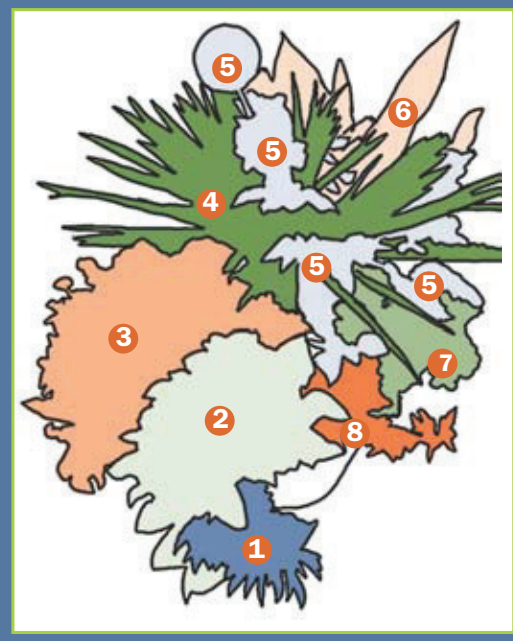
I stood looking at the expanse of decking that surrounds our pool area, and I knew that I had my work cut out for me. My mission was to soften the harsh lines of the hardscape. What better way to do that than with boldly planted pots? With a quick scan of the scene, it was evident that the four existing redwood containers were too small and in bad shape. I'm always up for a gardening challenge, however, so I dove right in.

My first action was to replace the redwood containers with large, sturdy concrete containers. Then, because I like a tropical look, I selected plants with bold, architectural shapes, such as bananas, cannas, and dracaenas, and planted each pot to its maximum capacity. The result was bountiful, dramatic, jam-packed containers that spilled over with color and visual interest.

Planning the extravaganza

I find that the big, bold, leafy plants with various textures, colors, and habits are the most important element of my container gardens. My planting plans are based on successful designs I've used in the past, yet I'm always open to experimentation and serendipity.

Because I like my containers to be abundant, I choose plants that I know will perform well in tight quarters. Color is also a factor in my selection, and I try to select two or three colors of flowering annuals



COMBINATION 1

1 Western mugwort (*Artemisia ludoviciana*, USDA Hardiness Zones 4–9)

2 'Margarita' sweet potato vine (*Ipomoea batatas* 'Margarita', Z 11)

3 'Profusion Orange' zinnia (*Zinnia* 'Profusion Orange', annual)

4 Dracaena (*Dracaena* sp., Z 11)

5 'Snoho Wonder' dahlia (*Dahlia* 'Snoho Wonder', Z 9–11)

6 'Intrigue' canna (*Canna* 'Intrigue', Z 8–11)

7 'Sonata' petunia (*Petunia* 'Sonata', annual)

8 'Rubiginosa' alternanthera (*Alternanthera dentata* 'Rubiginosa', Z 9–11)

Photos, except where noted: Allan Mandell; illustrations: Melissa Lucas

Plants in 4-in.-square pots or larger have more mature root systems and are more likely to flourish in a large, tightly packed container.

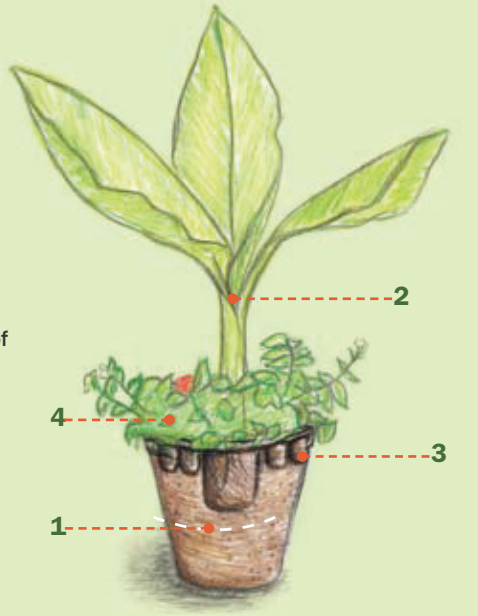
Two planting methods

When I first started container gardening, I brazenly packed each container with 30 plants. After several years, I have found more success using fewer plants, approximately 18 to 20 in each container. Annuals sold in 4-in.-square pots, rather than in cell packs, are more apt to survive in crowded conditions because their root systems are better developed. I arrange the plants so that they are most prominent on the side they will be viewed from. I also pull out any plant that is not behaving. Here are two planting methods that I use when packing my large-size containers. Give both types of arrangements a long, slow soaking once plants are in place; this is especially important when using the alternate method to prevent soil runoff.

STANDARD METHOD

When my design calls for a hefty core plant (combination 3), I simply place the core plant near the center of the pot and pack in as many supporting plants as possible.

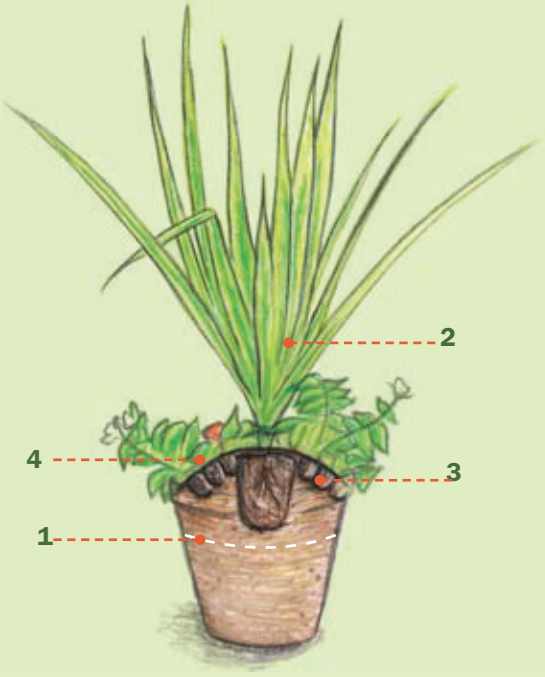
1. Fill the container approximately halfway with fresh, damp soil and time-release fertilizer.
2. Center the core plant slightly toward the back of the pot.
3. Add more soil and time-release fertilizer to within 8 in. of the top of the container.
4. Arrange the filler plants around the core plant, placing them as close together as possible and adding soil to secure each plant in place.



ALTERNATE METHOD

When using a core plant with a smaller base or trunk (combinations 1 and 2), I use a planting method that I've been experimenting with for the past few years. I like this method because it gives the core plant more height and creates more planting area for me to cram plants into.

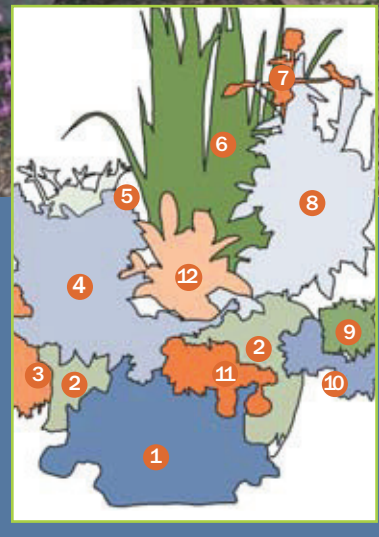
1. Fill the container approximately three-quarters full with fresh, damp soil and time-release fertilizer.
2. Place the core plant in the center of the container, making sure the soil level of the plant sits approximately 2 in. above the top of the container.
3. Add more soil and time-release fertilizer to the container to form a mound.
4. Place filler plants as close together as possible into the mound so that they cascade over the edge of the container.



Photos, this page: Jennifer Benner

COMBINATION 2

1 Lobelia (*Lobelia ricardii*, annual)
2 Blue fescue (*Festuca glauca*, Zones 4–8)
3 'Rocket Red' snapdragon (*Antirrhinum majus* 'Rocket Red', annual)
4 Blue bush sage (*Salvia urica*, Z 9–10)
5 'Nekan' pitcher sage (*Salvia azurea* 'Nekan', Z 4–9)
6 Iris (Iris cv., Z 3–9)
7 'Carmencita' castor bean (*Ricinus communis* 'Carmencita', annual)
8 'Liquorice Blue' giant hyssop (*Agastache scrophulariifolia* 'Liquorice Blue', Z 4–9)
9 'Lady in Red' Texas sage (*Salvia coccinea* 'Lady in Red', annual)
10 'Azure Pearls' petunia (*Petunia* 'Azure Pearls', annual)
11 'Red Madness' petunia (*Petunia* 'Red Madness', annual)
12 'Cabernet' rubber plant (*Ficus elastica** 'Cabernet', Z 11)



**This species may be considered invasive in some areas. For more information, go to invasiveplantatlas.org.*

I find a limited palette to be more harmonious, and it also makes the plant search much easier.

that complement the core architectural plants in each container. I find a limited palette to be more harmonious, and it also makes the plant search much easier. I use hot colors in my tropical designs, and I've had great success with monochromatic color schemes as well as combinations that featured purple and red flowers; apricot and lavender flowers; and orange, yellow, and white flowers. I find the most difficult colors to work with are magenta and blue. I use all hues of the selected colors and choose plants with green, yellow, purple, and gray leaves to use as backdrops.

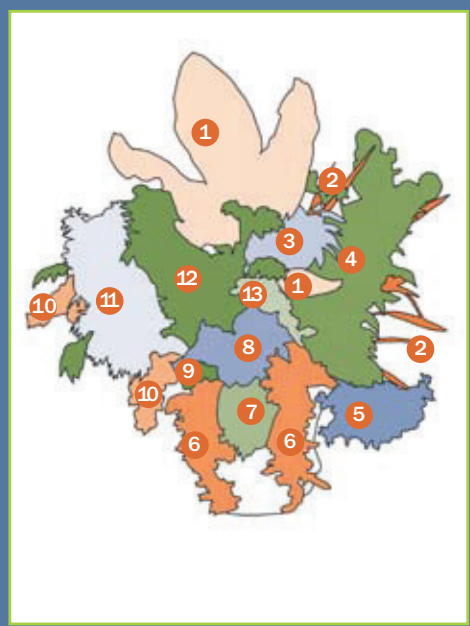
Getting the pots to thrive

For me, the ideal container size is 26 in. high and 30 in. across. I prefer using concrete pots because of their durability and unique sculptural qualities. I recommend drilling two ½-in.-dia. holes on each side of the container, 4 in. up from the base, in addition to a drainage hole in the bottom. These unobtrusive holes, easily created with a masonry bit, not only allow for better drainage but also create a reservoir of water. If these side holes become obstructed, I poke them with a bamboo stake to allow the excess water to drain out.

Because my containers are packed with plants, the soil tends to become root-bound. So I begin each season with new soil: a mixture of compost; perlite; and 14-14-14 granular, slow-release fertilizer. Once the plants are in place, they flourish in their large containers as long as I keep them well watered, either by a dependable automatic irrigation system or an unflagging hose handler. I also provide them with a weekly feeding of liquid fertilizer, and I deadhead them regularly.

I keep a garden journal for each year's container design, devoting one page to each container and using a circle diagram to note the placement and name of each plant. I also attach a digital photo of the container to the page. The record keeping sounds tedious, but in the long run, it provides me with invaluable information. I learn which plants not only make good companions but also are easy to maintain and seasonally strong. It's taken some trial and error to learn which plants work best together, but that's part of the fun of growing plants in pots. □

Juanita Nye surrounds her home in Portland, Ore., with bountifully planted containers.



COMBINATION 3

1 Red Abyssinian banana (*Ensete ventricosum* 'Maurelii', Zones 9–11)
2 Purple New Zealand flax (*Phormium tenax* 'Purpureum', Z 8–11)
3 'Casa Blanca' Oriental lily (*Lilium* 'Casa Blanca', Z 6–9)
4 'Nicky K' dahlia (*Dahlia* 'Nicky K', Z 8–11)
5 Dusty miller (*Senecio viravira*, Z 8–10)
6 English ivy (*Hedera helix** cv., Z 5–11)
7 Blue fescue (*Festuca glauca*, Z 4–8)
8 Red bedding dahlia (*Dahlia* cv., Z 8–11)
9 'Sizzler Burgundy' salvia (*Salvia splendens* 'Sizzler Burgundy', annual)
10 'Coral' bougainvillea (*Bougainvillea* 'Coral', Z 9–11)
11 Lion's ear (*Leonotis leonurus*, Z 10–11)
12 Honey bush (*Melianthus major*, Z 8–11)
13 'Meteor' sedum (*Sedum spectabile* 'Meteor', Z 4–9)

1. 'The Line' coleus (*Solenostemon scutellarioides* 'The Line', USDA Hardiness Zone 11)
2. Feather grass (*Stipa tenuissima*, Z 7–11)
3. Flying Colors™ Red diascia (*Diascia* Flying Colors™ Red, Z 8–9)
4. Superbells® Pink Kiss calibrachoa (*Calibrachoa* Superbells® Pink Kiss, annual)
5. 'Black Heart' sweet potato vine (*Ipomoea batatas* 'Black Heart', Z 11)
6. Supertunia® Royal Velvet petunia (*Petunia* Supertunia® Royal Velvet, annual)

Photos, except where noted: staff; illustrations: Steven Cominsky

Hanging Baskets

For a full look, it's important to plant the sides as well as the top

BY C. DWAYNE JONES

A hanging basket can serve a variety of functions, from accenting a front porch to filling an empty wall. No matter what the purpose, hanging baskets offer an opportunity to play with plant combinations to create a riot of color. Today's ever-shrinking landscapes mean fewer places to cultivate. Planting a hanging basket may be just the ticket for expanding your gardening realm. It is also one of the easiest ways to connect your garden with your home.

Trailing plants are traditionally used in hanging baskets with three plants of the same variety planted in the top. Another way to craft a hanging garden is to use an open-sided basket and plant the sides, as well, a technique that allows me to use three to four times the number of plants as in a traditional basket. I usually use a jumble of clumpers and trailers to create the illusion of masses of color and texture. I also mix in a few plants with great foliage to add interest throughout the growing season.

C. Dwayne Jones is a horticulturist and is superintendent of parks and horticulture in Waynesboro, Va.


3


5


1


6


4

Photos, this page: courtesy of Proven Winners

1 Choose a size

When it comes to baskets, size—or in this case, volume—does matter. The volume of the basket is directly related to the amount of water your hanging garden can retain; if you select a basket that is too small, you'll have to water daily, if not more often. A larger basket can make taller columns or posts look more in scale with your house or landscape. I use baskets that have open sides so that I can cut slits in the liner in a checkerboard pattern for planting (tip, facing page).

2 Insert a liner

To fully cover large baskets, you may need to overlap two rectangular sections of liner. While the exact lengths depend on the size of your basket, allow enough extra material so that, when the basket is filled with soil, some will still spill over the edges. Overlapping the liner in the bottom of the basket has the added benefit of slowing water flow out of the bottom.

3 Build a base layer of potting soil

Start with a base layer of good-quality potting soil, and press it against the bottom and sides of the basket so that you have a firm background to cut against when making the slits for the first row of plants. The soil level should be about 4 in. to 6 in. above the bottom of the basket when you complete this step.

Choosing a liner

All of the popular liner choices have their pros and cons.

- Sphagnum moss is nice looking but is tedious to work with and offers limited water-holding capacity.
- Cocoa liners (photo, left) are attractive but thick, making it difficult to plant through the sides.
- Burlap liners, treated with copper to slow degradation, are thin but can be unattractive and retain almost no water.
- Supamoss (photo, below) is a relatively new product that combines the best of both worlds. It is made of dyed recycled cotton fibers that are sewn to thin green plastic sheeting. The tiny needle holes allow for water drainage, yet the plastic membrane conserves the majority of the water for the plants. It is easy to poke holes into this material for planting, and the green, mossy look is appealing.

4 Insert a water reservoir

To help with aeration and watering, I insert a vertical 8-in. to 10-in. section of black slotted drainpipe, available at any hardware store. I adjust the length so that 2 in. to 3 in. of pipe is exposed above the final soil level; this ensures that the drainpipe does not fill with potting soil during rainfall or waterings. I place the pipe so that the end sits about 4 in. to 5 in. above the bottom of the basket. If the drainpipe hits the bottom of the basket, water will simply drain right out of the basket instead of filling the surrounding area. The pipe directs the water toward the bottom of the basket, which is the first place to dry out.

5 Cut the liner, and add plants

Using a sharp object, make small incisions in the liner just below the current soil level and carefully poke through the root-balls of the plants from the outside. Small plugs or cell pack–size annuals work best because they minimize the size of the openings in your liner; larger holes will let potting soil spill out and may even cause young plants to wash out during watering. If you must use larger plants, gently wash most of the potting soil from the root system and carefully compress the root mass into a torpedo shape and slip it through the liner.

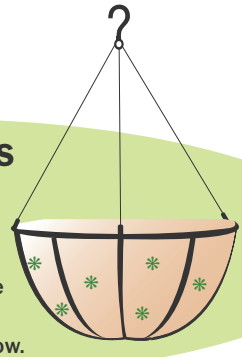
6 Continue planting to the top

Keep adding layers of potting soil, cutting slits, and inserting rows of plants in a staggered pattern until you reach the top of the basket. Top off your planting with a few upright annuals or perhaps even some small grasses. Trim the liner to about 1 in. to 3 in. above the final soil level so that a small amount peeks over the edge of the basket. This reduces the chance of potting soil being washed out of the basket when watering. Then give the whole basket a good soaking.

TIP

STAGGER YOUR PLANTS

To ensure maximum coverage while preserving visibility, place plants in a checkerboard pattern. After spacing plants evenly in the bottom row, create the next row so that its plants fall between, not directly above, those below.



SOURCES

Plants for hanging baskets are best purchased as small cell packs at local nurseries. The following mail-order companies offer a wide selection of baskets and liners.

BESTNEST, Cincinnati, Ohio; 877-562-1818; bestnest.com

CARTANNA INTERNATIONAL SALES, Point Roberts, Wash.; 866-949-2727; cartanna.com

TOPIARY ART WORKS AND GREENHOUSES, Clearwater, Kans.; 620-584-2366; topiaryartworks.com

Photos (silhouettes of baskets): courtesy of BestNest

Plant an Easy-to-Water Strawberry Jar

Plastic pipes deliver moisture where it's needed

BY MAGGIE STUCKEY

Many gardeners who have tried to use a strawberry jar for patio plantings have been frustrated by the challenge of keeping it evenly moist. Most jars are made of clay, which tends to dry out easily, and they are usually filled with sun-loving plants and positioned in the sunniest (and, therefore, fastest-drying) spot in the garden. The design of the strawberry jar creates one additional problem: the seeming impossibility of getting water, which wants to run downhill, out to the sides of the container where the plants' roots are.

You can solve this problem by taking advantage of the law of physics that says that water will run downhill until it meets an obstruction. The trick is to create vertical irrigation pipes from which water will ooze out horizontally.

To determine the size of PVC pipe you'll need, measure the height of your container and the diameter of the opening at the top. If you want to use several small plants in the top opening, choose a pipe that is approximately a quarter of the diameter of the top opening. You can figure this out by tracing the opening of the jar on a piece of paper and taking the paper to the store with you. Take a section of pipe, and stand it in the center of the tracing. If it seems like there's enough room left to

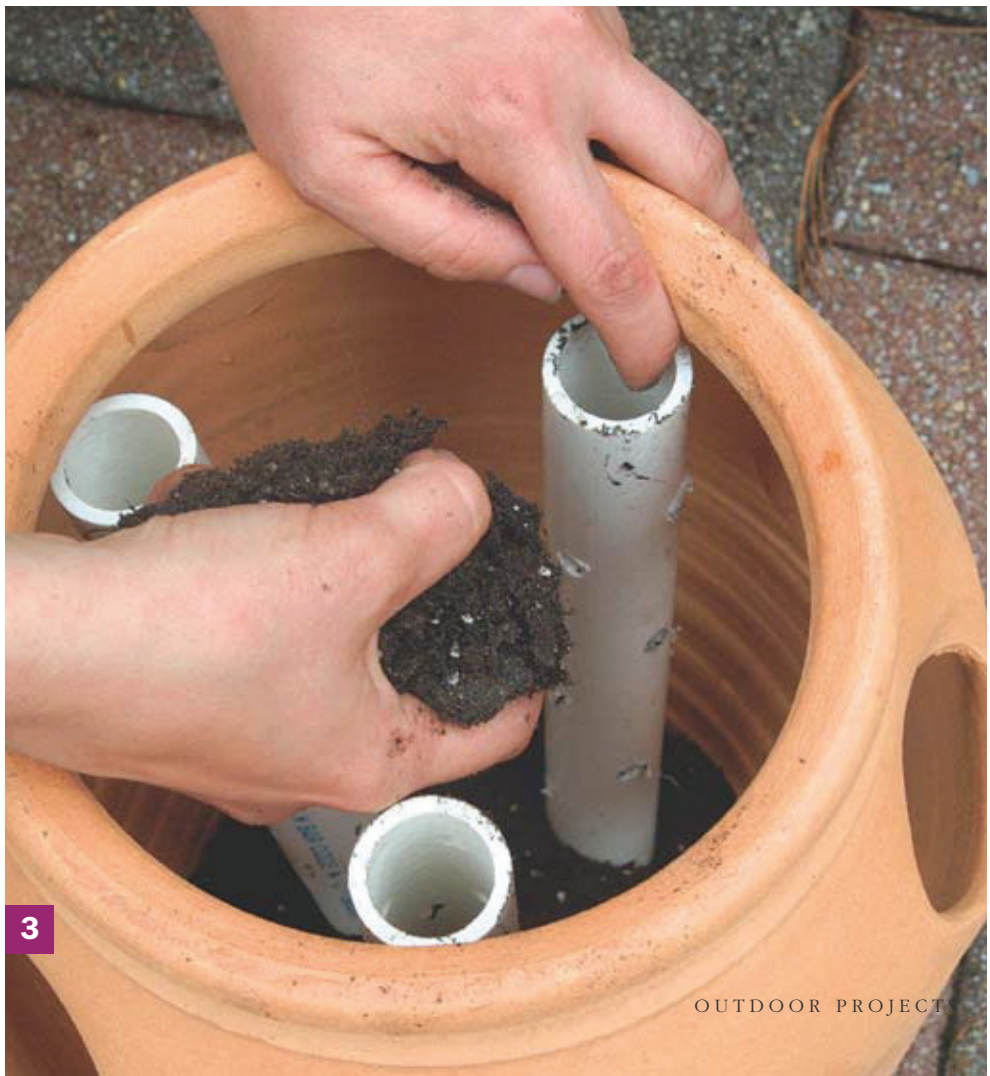
Photos, except where noted: Wendy Bowes; this page: Steven Cominsky

Materials list

- PVC pipe
- Tape measure
- Hacksaw (or get the store to cut the pipe for you)
- Drill (with a 3/16-in.-dia. or 1/4-in.-dia. bit)
- Corks or sink stoppers (to fit pipes)
- Knife
- Strawberry jar
- Soil
- Plants

After cutting the pipes to a length slightly shorter than the height of the strawberry pot, drill holes on all sides of the pipes, all the way along their length. Drill fewer holes in the ends that will be near the bottom of the pot.

Jam a cork into the bottom end of each pipe. If necessary, slice the cork off with a knife so that it is flush with the pipe; that way, the pipe will stand up straight without wobbling.



Hold the pipes in position while you add moistened potting mix up to the bottom of the lowest pocket. If you use only one pipe, place it slightly off center so that it doesn't block the drainage hole.

4

Squeeze the soil around the root-ball of each plant so that it will fit into a planting pocket. Working from the outside in, snuggle the root-ball into the pocket, then reach inside and spread out the roots. Pat potting mix over the roots, and continue adding it until it is level with the bottom of the next pocket. Continue this process to the top of the pot.

5

When the pot is fully planted, pour water directly into the pipes. Because the bottom is blocked, the water will have nowhere to go but out through the holes and sideways toward the plants—right where you want it.

fit some small plants around it, you've found the right size. On the other hand, if you want to center a large plant at the top, use three smaller pipes, instead, and place them close to the rim for a larger planting space.

If the store will cut the pipe to size for you, have it cut the pipe 1 in. to 2 in. shorter than your container is tall, or you can cut it yourself at home with a hacksaw. A cork or sink stopper fitted snugly into the end of the pipe will keep water from draining out of the bottom.

To assemble your strawberry jar with built-in irrigation, follow the photo instructions shown here. Strawberry jars are often planted with herbs, so here's an idea for an herb combination using some of the more ornamental varieties. For the top of the jar, choose an upright rosemary (*Rosmarinus officinalis* and cvs., USDA Hardiness Zones 8–11), and underplant it with 'Kent Beauty' oregano (*Origanum* 'Kent Beauty', Zones 5–8), an ornamental oregano featuring hoplike bracts. Or pick a lavender (*Lavandula* spp. and cvs., Zones 5–9), and underplant it with a prostrate variety of rosemary.

In the pockets, you could plant some of the more unusual thymes, like lemon (*Thymus* × *citriodorus* and cvs., Zones 6–9), nutmeg (*T. praecox* ssp. *arcticus*, Zones 5–9), lavender (*T. thracicus*, Zones 5–9), or caraway (*T. herba-barona*, Zones 6–9). Use winter savory (*Satureja montana*, Zones 5–8), tarragon (*Artemisia dracunculus*, Zones 3–7), and 'Tricolor' sage (*Salvia officinalis* 'Tricolor', Zones 5–8) to fill the remaining pockets. □

Maggie Stuckey is co-author of the book McKee & Stuckey's The Bountiful Container *(Workman Publishing Company, 2002).*

Photos, this page: Steven Cominsky

1. ‘Goodwin Creek Grey’ lavender (*Lavandula* ‘Goodwin Creek Grey’, Zones 7–10)
2. Lemon verbena (*Aloysia triphylla*, Z 8–11)
3. Get Mee® Purple campanula (*Campanula portenschlagiana* Get Mee® Purple, Z 3–8)
4. ‘Tricolor’ sage (*Salvia officinalis* ‘Tricolor’, Z 5–8)
5. Curly mint (*Mentha spicata var. crispa**, Z 3–7)

**This species may be considered invasive in some areas. For more information, go to invasiveplantatlas.org.*

Raised beds can go where no other garden can. *Whether you're trying to avoid your preexisting soil or your sunniest spot happens to be on a hill like this, a raised bed is the perfect solution. A few rocks along the bottom help level the bed at this site.*

Raised Beds

Create a home for better veggies

BY LINDA CHISARI

Raised beds solved many of the garden problems that faced me 20 years ago in our new Southern California home. Among the challenges were terrible soil, a concrete-paved yard, arid growing conditions, small children, and a big, exuberant puppy. When we read the real estate agent's description of our house-to-be, four words eclipsed all others: "perfect backyard for pool." To me, those words meant a warm southern exposure and a sizable empty space in which to plant a vegetable garden.

The sizable sunny space turned out to be about 2,000 square feet of concrete pavement. True, it was large enough for a decent-size garden. But also true was that what little soil existed was heavily compacted and lacked organic content. Once before, we had been faced with difficult growing conditions. On a granite ledge with no soil in New Hampshire, my husband had built a raised bed where I grew a small salad garden. So I figured, why not design a system of raised beds that would allow me to grow vegetables at this new home?

Decide on the materials and a design

There were a number of reasons why raised beds seemed the perfect way to garden. First, my husband was an accomplished carpenter and could build the boxes. Second, we could leave the concrete in place and simply break up the portions under the boxes to provide drainage. Soil quality was a third reason. We were able to fill the beds with soil by using compost from our own pile and supplementing it with some topsoil and chicken manure. This created a great growing medium.

Because we live in a Mediterranean-type climate with less than 10 in. of rainfall per year and almost none between April and November, we knew we would have to irrigate. Raised beds allowed us to set up an irrigation system that included a hose bib in each box. This would allow us to water each bed independently.

It didn't take long for us to see that our raised beds had several unanticipated advantages. Our golden retriever loved to race around the beds but rarely jumped into them. Our children could easily ride their Big Wheels around the obstacle course we had unwittingly developed for them. And neither of these activities nor my gardening compacted the soil because no one ever walked on it. It remained fluffy and well aerated, allowing plant roots to grow freely.

I wanted eight raised beds, and I wanted them made out of wood. Construction-grade redwood, which contains knots and some imperfections, seemed like a logical choice because we knew it would last many years and would cost less than many other types of wood.

The design of the beds was based on practical considerations. The dimensions, 8 ft. long by 4 ft. wide, were derived from the fact that lumber is available in 8-ft. lengths, so there would be minimal cutting and no waste. I could comfortably reach only 2 ft. into the beds, so a width of 4 ft. would allow access to the middle of the

Pressure-treated alternatives

If you'd like to avoid using wood treated with chemical preservatives for your raised beds, here are a couple of options:

- **Recycled-plastic lumber**
  Many of the plastic milk bottles, detergent containers, and grocery bags we recycle are being mixed with wood fiber to make a new generation of decking material: composite lumber. This recycled-plastic lumber is now available in many home-improvement stores.
- **Naturally rot-resistant woods**
  Redwood, cypress, red cedar, and black locust are all, to varying degrees, rot resistant. They can be expensive, though, and supplies may be limited by region.

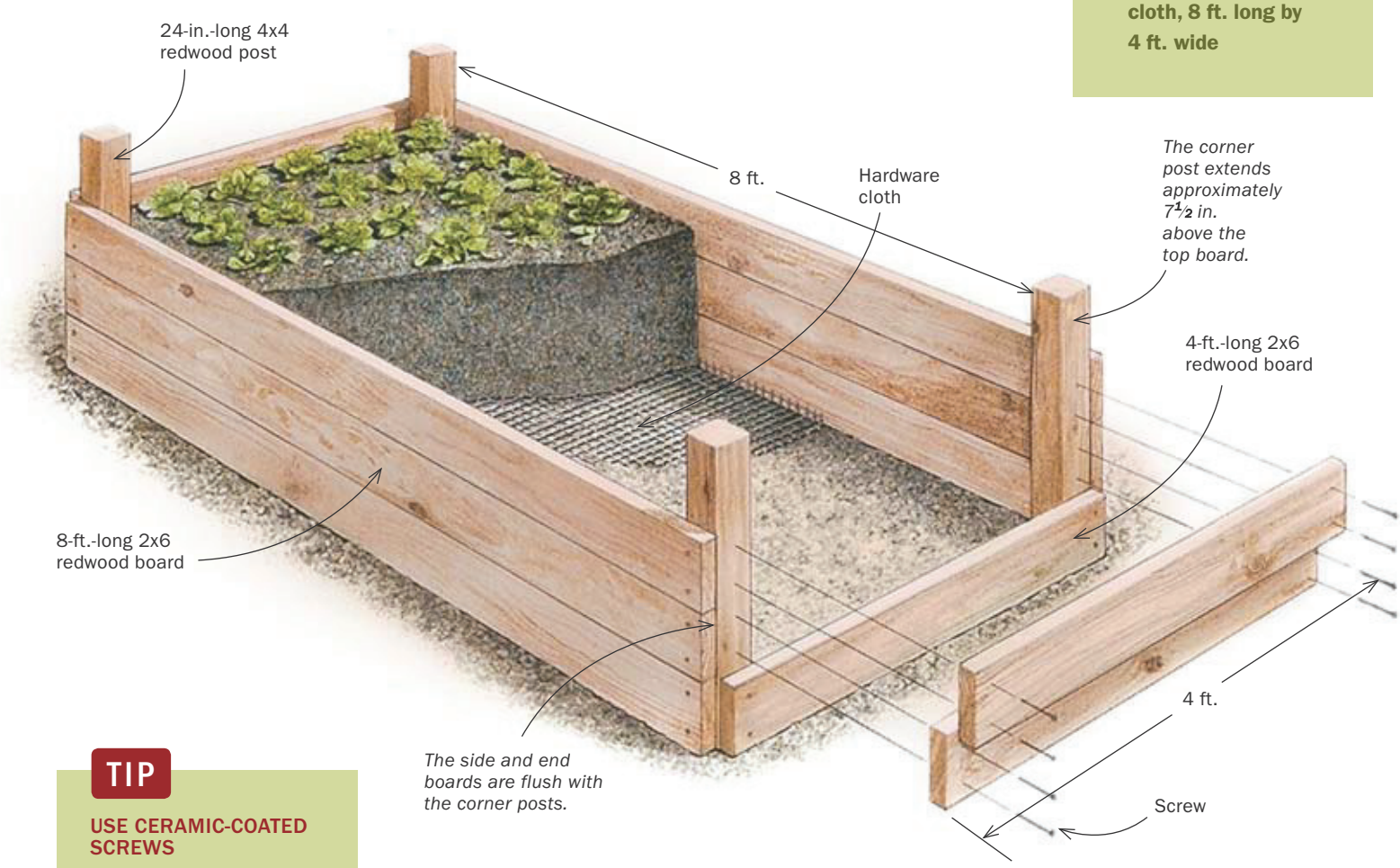
Photos: Stephanie Fagan (opposite); Scott Phillips (this page)

Blueprint for a raised bed

1. **To make the corner posts, measure and cut the 8-ft.-long 4x4 into four 24-in. lengths.**
2. **To make the long sides of the bed, nail three 8-ft.-long 2x6s one at a time to two corner posts; you will have boards stacked three high. The bottom board should be flush with the bottom of the post, while the top board should end approximately 7½ in. short of the top of the post. Repeat to form the second long side.**
3. **Cut the remaining three 2x6s in half to yield six 4-ft.-long 2x6s for the short ends.**
4. **Stand the two long sides of the bed parallel to each other, approximately 4 ft. apart. Nail the 2x6 end pieces to the corner posts, three to each end. Align them so that they are flush with the posts. The raised-bed form is now complete.**
5. **If you're worried about gophers or moles, staple an 8-ft.-long by 4-ft.-wide piece of ½-in.-square hardware cloth across the bottom of the box. This allows drainage and root growth but keeps the critters out.**

What you'll need (per bed)

- One 8-ft.-long 4x4 redwood post for the corners
- Nine 8-ft.-long 2x6 redwood boards for sides and ends
- 1-lb. box of 3½-in.-long ceramic-coated decking screws
- ½-in.-square hardware cloth, 8 ft. long by 4 ft. wide



TIP

USE CERAMIC-COATED SCREWS

Galvanized nails and screws are perhaps the most common outdoor fasteners, but they don't play well with redwood. A chemical reaction can occur and stain the wood. So use ceramic-coated decking screws instead.

beds from either side. I measured several of our chairs and found that they all had a seat height of 16 to 19 in. Because we had decided to use 2x6 redwood, we could stack the boards three high and end up with a finished height of 16½ in. (the actual width of a 2x6 is 5½ in.). This made the edge of the box a comfortable height on which to perch and gave more than enough root space for the plants.

The boards were screwed to 4x4 corner posts that extend nearly 8 in. higher than the sides. I sometimes drape bird netting for pest protection or row covers for

Drawing: Gary Williamson; photos (opposite page): Rosaline Wanke

Measure, mark, and cut the side posts. *You'll need only one 8-ft.-long 4x4 post for each bed because you'll cut it into four equal pieces, one for each corner (left). Attach three 8-ft.-long 2x6s to the corner posts with nails (right).*

warmth over the posts. The paths between the beds are 3 ft. wide to accommodate a wheelbarrow.

Accessorize your bed

Beds can be customized to meet a variety of specific needs. For some clients, I've designed beds that have a 6-in.-wide board or "cap" around the edge to make sitting more comfortable. (This makes it more difficult, however, to turn the soil.) For other beds, I've extended the corner posts up to 8 ft. to allow the attachment of trellises for beans, cucumbers, and other climbers. In gopher-prone areas, I've designed beds that have hardware cloth tacked across the bottom. For some beds, I've devised a system of hoops, using PVC irrigation pipe, over which to drape bird netting or row covers to keep cabbage loopers out.

I have experimented with several irrigation products, including microemitters, soaker hoses, and drip pipe. I prefer the flexible soaker hoses available in most hardware and garden stores. They can be snaked in any configuration and are easily removed when it's time to turn the soil. I use inexpensive chopsticks to keep the hoses in place.

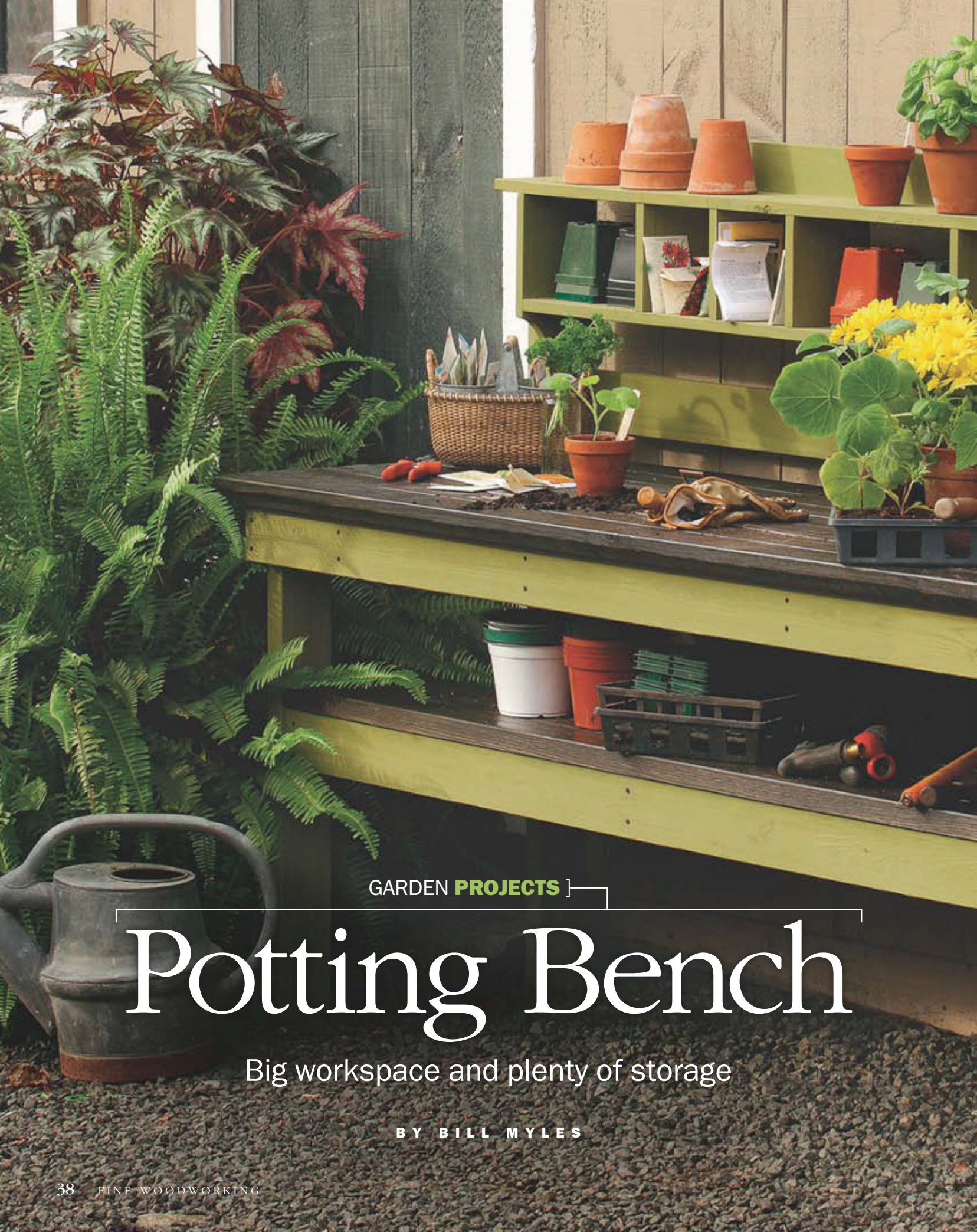
Because the price of redwood has risen, many clients ask about using less expensive pressure-treated wood. I discourage them from making this choice because I'm not comfortable using chemically treated products around food crops. (See alternatives on second page of article.)

It has been 20 years since we built our beds, and we are beginning to see signs of wear that indicate we need to start rebuilding. They have certainly been a good value, having held up to blasting sun and year-round cultivation. Where there was once only concrete, the soil is now black and rich and teeming with earthworms. The eight beds also make crop rotation easy to track. Everything I've grown in the garden has thrived.

Over the years, we have slowly removed the concrete paving between the boxes and replaced it with a thick layer of pea gravel that allows the little rain we get to percolate into the ground. And it crunches delightfully underfoot. Because the vegetable garden is the primary view from our kitchen window, it has been an added pleasure to look out on the raised beds with their profusion of vegetables, herbs, and edible flowers spilling over the edges. Thanks to the raised beds, we can enjoy homegrown produce every month of the year. □

Linda Chisari is a landscape designer in Southern California, where she gardens year-round.

Pull it all together. *Stand up the constructed long sides of the bed so that they are 4 ft. apart and parallel to each other. Complete the bed by nailing the short 4-ft.-long 2x6 boards to the posts.*



GARDEN **PROJECTS**

Potting Bench

Big workspace and plenty of storage

BY BILL MYLES

Photo, this page: Thomas Allen

In the heart of every gardener is the desire for a potting bench—one that can be used year-round, though there will be times when it stands still and orderly, its surface swept and tidy, with tools, pots, labels, and soil all in their places.

As a carpenter, I have come across a few potting benches—some bluntly utilitarian, some detailed like fine furniture. For this bench, which isn't difficult to build, the original design concept came during the give-and-take between carpenter and client.

My client wanted a potting bench for her garden for seed sowing, transplanting, and potting up cuttings. She wanted the bench to be 6 ft. long, about 2 ft. deep, and 32 in. tall. She requested organizing shelves on top and a hatch with hardware cloth, providing a potting surface that allows excess soil to fall through to a bin on the shelf below.

Deciding on materials for the potting bench was easy. I chose redwood because it's readily available on the West Coast and because it naturally resists rot. When choosing wood, look for pieces that are relatively straight, dry, and knot-free. If redwood is unavailable, consider cedar, another good weather-resistant wood.

To assemble the bench, I used 2½-in.-long ceramic-coated deck screws. Redwood is fairly soft, so drilling pilot holes for screws isn't necessary unless you are within 1½ in. of the end of a board. In this case, drill ⅛-in.-dia. pilot holes to keep the wood from splitting. For a rustic look, drive the screws flush with the surface and leave them exposed. But for an elegant look, countersink the screws so that the heads are ¼ in. to ⅜ in. below the surface (a ⅜-in.-dia. Forstner bit works best for this). The resulting holes can be filled with plugs, giving your bench a finished look and making the top easy to clean.

Making the frames

The upper frame consists of a 66-in.-long 2x4 rear apron, a 69-in.-long 2x4 front apron, and four 20½-in.-long 2x4 stretchers. Using two screws at each connection, attach the outer stretchers to the aprons, offsetting the front apron by 1½ in. at each end. The inner stretchers determine the location of the hatch. I left 18 in. between these two pieces and set them 6 in. to 8 in. from one side or the other.

The lower frame is similar to the top, except that the front and back rails are each 66 in. long and the three stretchers are each 19 in. long. Attach the outer stretchers to the ends of the rails with screws, placing

What you'll need

MATERIALS

Redwood or cedar lumber:

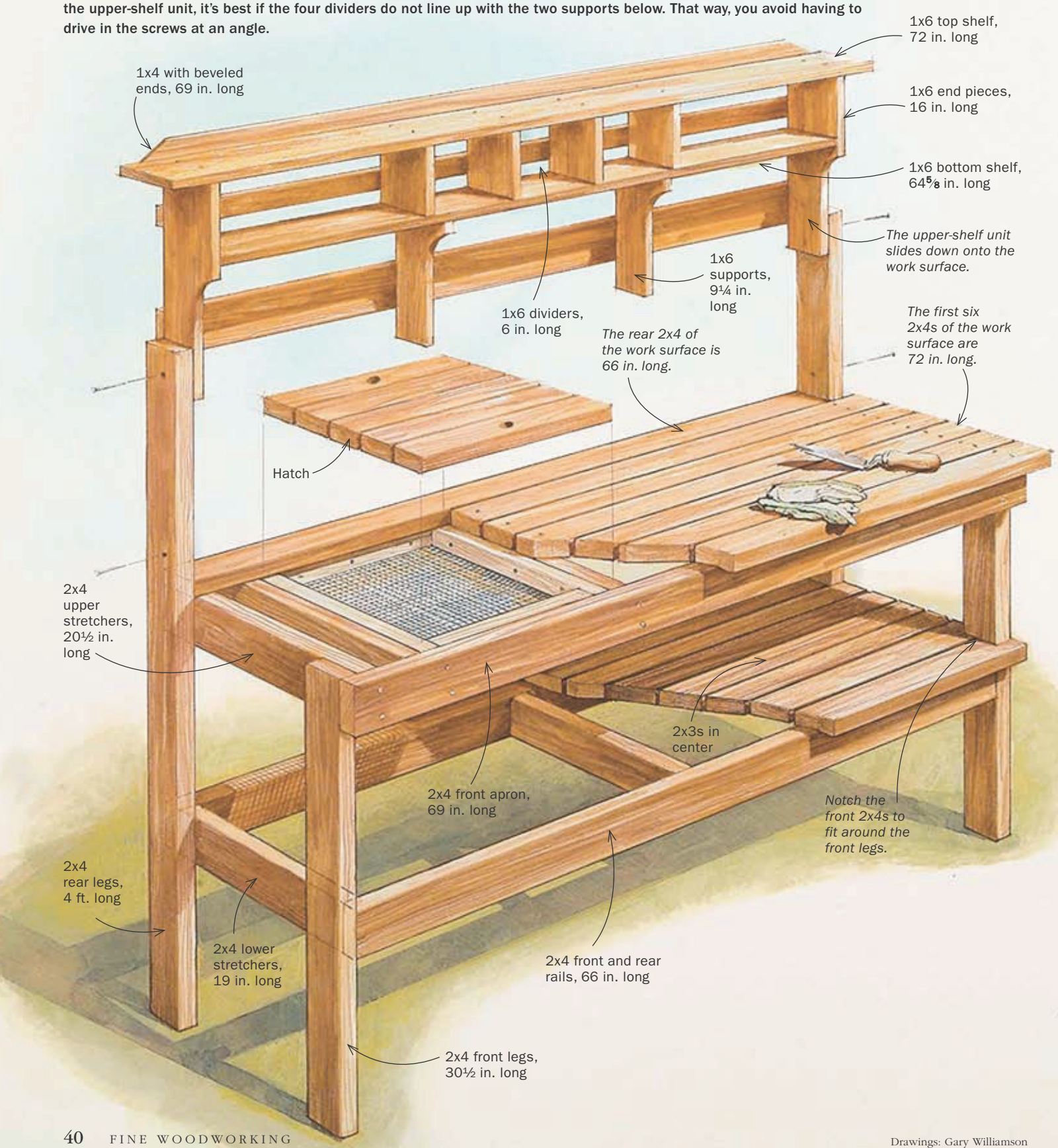
- **Eleven 12-ft.-long 2x4s**
- **One 12-ft.-long 2x3**
- **One 8-ft.-long 1x6**
- **Two 6-ft.-long 1x6s**
- **Two 8-ft.-long 2x2s**
- **Three 6-ft.-long 1x4s**

HARDWARE

- **One 2-ft.-long by 2-ft.-wide piece of ½-in. hardware cloth**
- **One hundred 1⅝-in.-long ceramic-coated deck screws**
- **Two hundred 2½-in.-long ceramic-coated deck screws**

Building the bench

The overall directions for the potting bench are simple, and you can modify the design according to your needs or style. Myles added boards to the back of the top shelves, for example, to keep things from falling off, but that's optional. He also cut the lower supports and ends of the top shelf on an angle to break up all of the straight lines. When assembling the upper-shelf unit, it's best if the four dividers do not line up with the two supports below. That way, you avoid having to drive in the screws at an angle.



Drawings: Gary Williamson

the front-rail ends flush with the outer side of the stretchers. Place the third stretcher in the center.

Cut two 2x4s 30½ in. long for the front legs and two 2x4s 4 ft. long for the back legs. Mark the front legs 15 in. from the bottom. This is where the top of the lower frame will line up. Mark the back legs at 15 in. and at 30½ in. from the bottom. The first mark indicates the top of the lower frame, and the second mark indicates the top of the upper frame.

Once the legs have been cut and the top and bottom frames constructed, they can be connected. The easiest way to attach the legs is to stand the two frames on their backs, 10 to 11 in. apart. Line up the frames to the marks on the back legs. Use three 2½-in.-long screws at each connection.

For the front legs, line up the lower frame with the 15-in. mark and align the top edge of the upper frame with the top of the leg. Drive screws from the outside of the legs into the frames. The bench can now be tipped up onto its legs with the bottom shelf and work surface screwed on.

Assembling the bench

The lower-shelf surface consists of one 2x4 66 in. long, four 2x4s 69 in. long, and two 2x3s 69 in. long. Using two screws at each end, install the 66-in.-long piece first, between the back legs and flush with the back edge of the frame. Next, install the two front 2x4s. The first board should overhang the frame by 1½ in., so you will need to cut notches 1½ in. deep and 2 in. long from each end

Overhang the edge of the lower shelf. *Cut notches from each end of the front two boards to fit around the front legs.*

Evenly space the upper- and lower-shelf boards. *Use shims as spacers and to keep the boards in place while driving in the deck screws.*

Photos, except where noted: Boyd Hagen

Add the hatch

Add a screen. *Affix the hardware cloth to the sides of the interior stretchers. The 20¼-in.-long cleats hold the hardware cloth in place and support the hatch.*

to fit around the front legs (see top photo, previous page). The second board has notches 1½ in. deep and 1½ in. long cut from each end. After these boards have been screwed in, place and space evenly the remaining four boards on the frame and line up the ends. Use cedar shims as spacers between adjoining boards to adjust the gaps and hold the boards in place while you drive in the screws (see bottom photo, previous page).

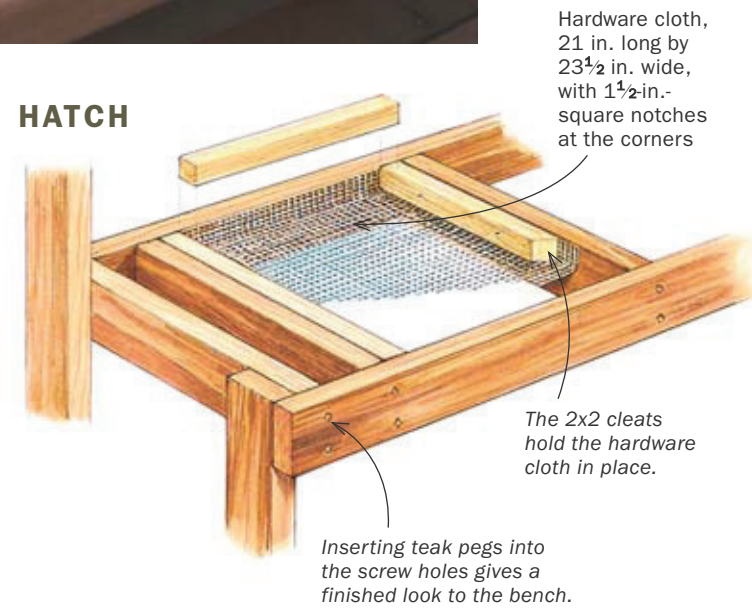
The work-surface boards, one 66 in. long and six 72 in. long, are installed in the same manner as the lower-shelf boards, except that you will not need to notch around the front legs. Install the 66-in.-long piece first between the back legs, followed by the front piece, which will overhang the front and sides by 1½ in.

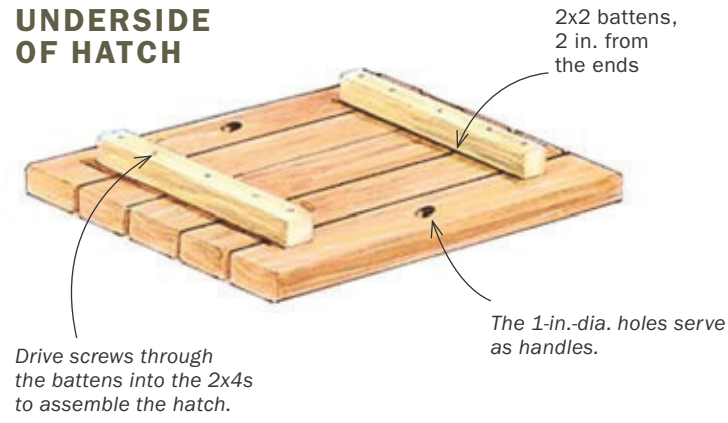
Cutting the hatch

To cut the hatch, place a straightedge on top of the bench. Sight down through the cracks to find the inside edges of the stretchers that will frame the hatch opening. Draw lines for both sides of the opening. Use a jigsaw to make the cuts. The gap between the boards should be wide enough to insert the blade to start the cut. If it's not, drill a hole next to the line to insert the blade.

To assemble the hatch, take the cutout pieces and lay them on top of the bench, upside down. Make sure to match the spacing of these pieces with the spacing of the work-surface pieces. Use two pieces of 15-in.-long 2x2s as battens to hold the hatch together. Place the 2x2s 2 in. from the ends of the 2x4s, and screw them together. With a 1-in.-dia. Forstner bit, drill two holes in the hatch to serve as handles.

Use tin snips to cut a piece of hardware cloth 21 in. long by 23½ in. wide. Cut 1½-in.-square notches from each corner, and fold up the sides, using a block of wood as a straightedge. Fit the hardware cloth snugly into the hole. Cut two 2x2 cleats 20¼ in.





Finish it off

Plugs conceal the countersunk screws. *Painting them black protects them from the elements and adds a decorative touch.*

Apply a wiping varnish to the work surface. *It protects against moisture, but reapply yearly for best results.*

long, which are used to affix the hardware cloth to the sides of the interior stretchers (see photo and top drawing, opposite page). These cleats also support the hatch, so make sure they are securely attached. Cut two more pieces to fit to support the front and back, and screw them into place. The hatch should fit down into the opening and sit flush with the rest of the bench.

Fitting the upper-shelf unit

The upper-shelf unit is made with 1x6 redwood and consists of a 72-in.-long top shelf, a 64⅝-in.-long bottom shelf, two 16-in.-tall ends, two 9¼-in.-tall supports, and four 6-in.-tall dividers.

First, screw the two supports to the bottom shelf. Next, screw the dividers to the top shelf, making sure not to line up dividers with supports and avoiding awkward assembly.

Once the dividers have been attached to the top shelf, flip it upside down and screw the dividers to the bottom shelf. Affix the ends with screws.

There are two 66-in.-long 1x4s (or 1x2s) and one 69-in.-long 1x4 with beveled corners screwed to the back to prevent items from falling off the shelves. The shelf unit should now slide snugly between the two back legs and can be attached with two screws driven into each leg. □

Bill Myles is a carpenter in Southern California.

TIP

MILK PAINT ADDS A VINTAGE LOOK

Applying two coats of bayberry green milk paint gives the frame a beautiful, old-fashioned finish. Here are some tips for working with this nontoxic option:

- *Stir frequently. The powder/water mixture tends to settle.*
- *Work quickly, and avoid painting in the sun. Milk paint dries faster than other paints.*
- *Seal it. A coat of polyurethane will protect a milk-painted wooden surface from water marks.*

Source: milkpaint.com

Photos, this page: Timothy Fagan (top left); Steven Cominsky (top right, bottom right)

Japanese-Style Garden Gate

Versatile assembly can be adapted to any gate design

BY ASA CHRISTIANA

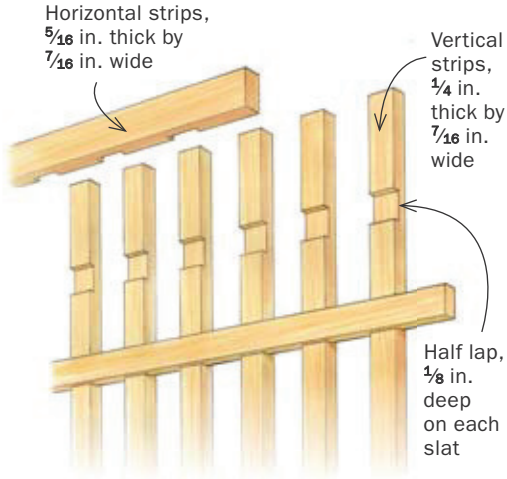
Pretty path to the backyard. *This cedar gate is more like a big passage door, with deep tenons to keep it square and sag-free.*

When we moved west and bought a fixer-upper in Portland, Oregon, one of my first to-do items was replacing a broken-down fence with one of my own design. I started with a Japanese-style arch over the opening, and wanted a gate in a similar style.

I've learned not to rush the design stage, so I visited the Portland Japanese Garden, took pictures of every door and gate I found there, and did some digging online. This gate, with falling ginkgo leaves pierced through the lower panel and traditional Japanese gridwork at the top, is the result.

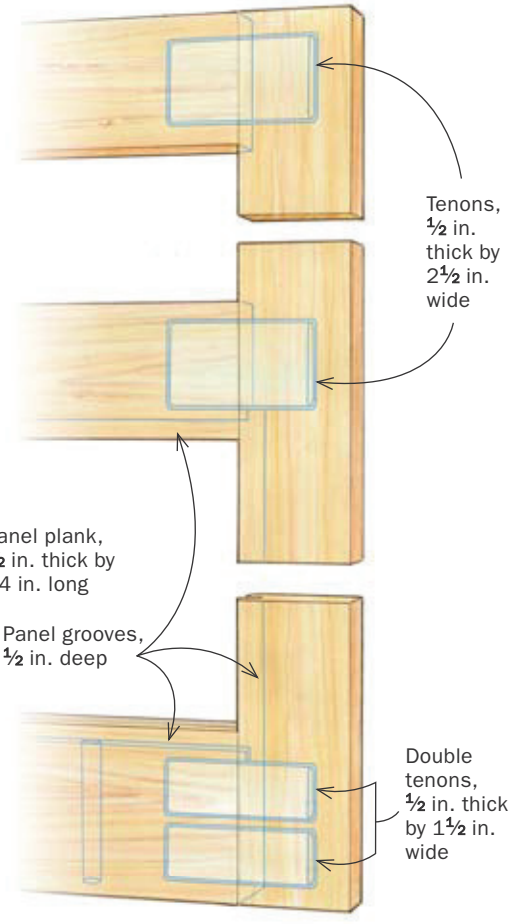
Water, weather, and weight are tough on gates, and over the years they tend to sag. The usual solution is a diagonal rod, surface-mounted and tightened with a turnbuckle. But in my research, I didn't see any Japanese carpenters resorting to such contrivances. Like them, I relied on the right materials and robust joints to keep the gate square and swinging smoothly. After more than a year, it hasn't sagged a bit.

Photos, except where noted: Asa Christiana; drawings: Dan Thornton



SAG-RESISTANT ASSEMBLY

I dimensioned the parts to look good and weigh as little as possible while accommodating deep tenons. The lower tenons are doubled up because seasonal wood movement will wreak less havoc on two smaller tenons than one very wide one. The lower panel boards are held in grooves while the upper gridwork is held by strips similar to glass stops.



Online Extra

Download SketchUp models of this gate and the jig used to cut the gridwork joinery at **FineWoodworking.com/Outdoor.**

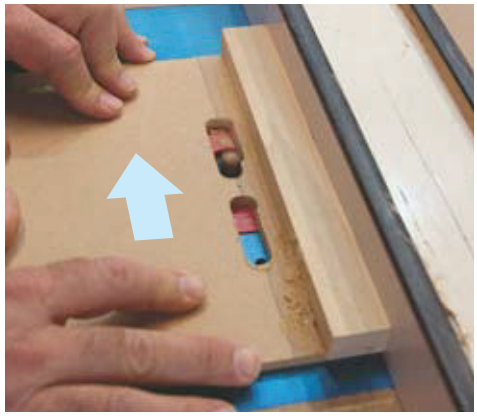
Deep tenons made simple

This simple jig, combined with a router bushing installed in the router base and a long upcut spiral router bit, creates matching mortises in the rails and stiles of this frame. The jig shown below is used for the double mortises in the bottom rail. Follow the same approach to make a jig for the single mortises in the upper rails.

BUILD THE JIG

Nail on the plate. *It can be difficult to get the wood fence flush with the ¼-in. MDF. Instead, attach it so that it sticks out a little. Because the jig's fence will ride the router fence when you cut the slot, the slot will be perfectly parallel to the jig fence, which is what matters.*

Get ready to rout. *This jig needs two mortise slots. Lay out the slots, marking the centerline and ends of each slot, and then drill ¾-in.-dia. holes at the left end of each slot. For the middle and top rails, make a similar jig with one slot for the single tenons in those joints.*



Head to the router table. *Each slot can be routed in a single pass with a ¾-in. bit, but it's safer to make two passes with a ½-in. bit. Drop one of the drilled holes over the bit to help you set the fence accurately to one edge of the hole. Hold down the jig, turn on the router, and make a pass on each slot, using the pencil lines as guides. Then turn off the router, adjust the fence, and take a second pass on each slot to widen them to the full ¾ in.*

Sturdy frame for gates of any size

The first step was to choose the wood, which was easy. Widely available and affordable, western red cedar offers an excellent combination of strength, weight, and weather resistance. I started by picking very straight, 1½-in.-thick decking boards out of the lumberyard pile, and milled them down to 1¼ in. using my thickness planer. The boards are thick enough to resist warping and bowing, and to accommodate the ½-in.-thick tenons, without being heavier than they needed to be.

When using a softer wood like cedar, the walls of the mortises should be at least ⅜ in. thick to have enough strength to resist flexing out when the tenons are inserted. Avoid boards that have sections of cream-colored sapwood in them. That part of a cedar log is far more prone to rot.

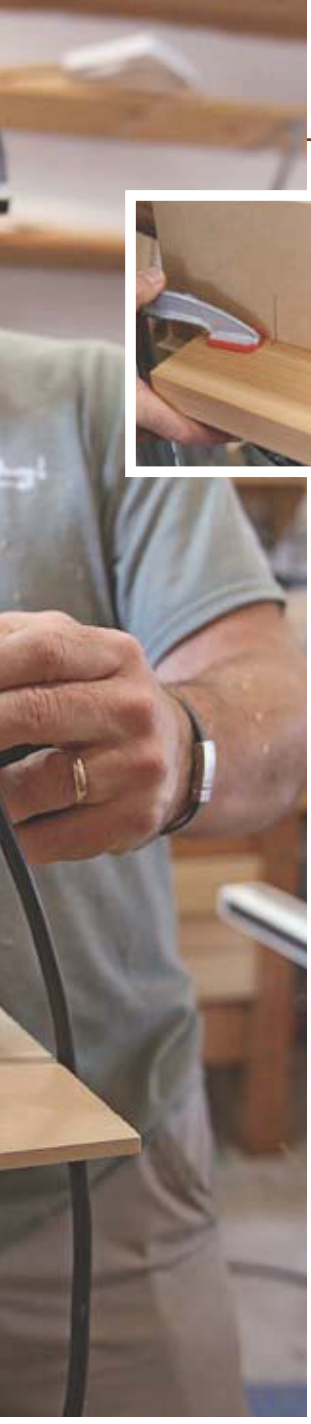
As for the deep tenons, I used slip-tenon (or loose-tenon) joinery, an approach that makes a traditional joint much simpler. Rather than being integral parts of the rails, the tenons are made from other stock, ripped and shaped on the tablesaw and router table to fit into matching mortises in the frame pieces. The beauty of this approach is you can simply run the tenons through your thickness planer to achieve a perfect fit. For the matching mortises I used a plunge router jig. The mortises are all 2 in. deep because that's the maximum depth possible with a standard ½-in.-dia. spiral router bit; each tenon is just under 4 in. long.

I designed the bottom rail wider than the two upper rails. The upper rails each get single wide tenons, while the extra width of the bottom rail accommodates two narrower tenons, adding to the strength. A wider bottom rail also just looks good in a frame-and-panel assembly, grounding it.

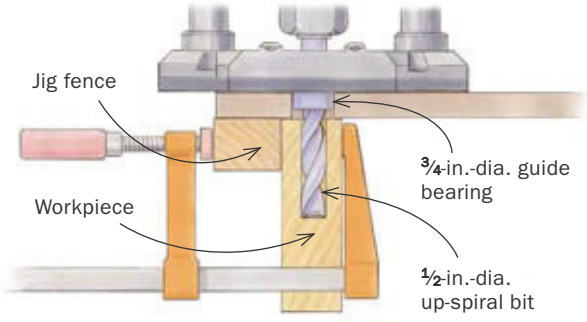
To prevent water from pooling in the groove of the bottom rail, I drilled ⅜-in.-dia. holes, spaced about 6 in. apart, down through it before assembly.

Photos this page and opposite: Andy Engel

ROUT THE STILES AND RAILS



Mortise the stiles. *Measure to determine where the center of the jig goes, then clamp it on the edge of the workpiece. Set your router to use the bit's full cutting depth (around 2 in.) and rout each mortise with a series of shallow passes. Upcut spiral bits remove some of the chips; stop and vacuum the chips out if they get packed in. A ¾-in. guide bearing keeps the ½-in. bit centered in the jig and on the workpiece, leaving ⅜ in. of material on either side of each mortise.*



Mortise the rails. *As with the stiles, measure and mark where the center of the jig goes, and clamp the jig on the workpiece. Use the same router setup used to mortise the stiles to mortise the rails, again making a series of shallow passes. Be mindful that the top rails each get one mortise per end, while the bottom rail gets two mortises per end.*

Foolproof results. *Vacuum out the last of the wood chips, and the mortises are done. Note the long clamps used to hold the workpiece vertically against the edge of the workbench.*

Matching mortises. *It's critical to make the mortises in the correct locations on each piece to keep the gate square. The jig's job is to ensure that the mortises match.*

MILL PERFECT-FITTING TENONS

Plane a board to a snug fit. *Run a board through your planer until it will slip into the mortises with hand pressure.*

Rip and rout. *Rip the board on the tablesaw to just narrower than the width of the mortises, then use a ¼-in. roundover bit to rout all four edges.*

Chop and bevel. *Cut the tenons a little short to leave room at the bottom of the mortises for the glue that will be pushed down there during assembly. Then bevel the ends a little to make it easier to insert the tenons.*

Door decoration

The ginkgo leaf is featured prominently in Japanese design and culture, so I decided to cut a series of those shapes into the lower panel boards.

Arrange by eye. *After printing ginkgo leaves on paper, glue them to cardboard and cut them out to use as templates. With the panel boards all laid out, play around with the templates until you find the windblown effect that looks right to your eye. There will likely be some erasing involved, but it's easier to erase pencil lines than a hole in the wrong spot.*

Jigsaw does the job. *Drill holes inside the perimeter of each leaf outline to make a place to start each cutout. Then put a curve-cutting blade in your jigsaw (I used a Bosch T119BO blade), and get to sawing and sanding. Smooth the shapes. Wrap 80-grit sandpaper around a dowel and smooth away the bumps and wood whiskers.*

REFINED TEMPLATE EASES CUTOUTS

Ginkgo leaf patterns are easy to find online, but these simplified silhouettes will likely be easier to cut out and sand.

The details are up to you

Once you know how to make a big, sturdy frame, you can design any gate you like. I filled the lower frame with ½-in.-thick cedar boards, and the upper one with Japanese-style gridwork.

The thin lower boards are lightweight and easy to pierce with the ginkgo leaf shapes I had planned. To prevent big gaps from appearing between the boards as they shrink and expand over the years, I fired a single brad through the rail into the ends of each board, both top and bottom. This allows the wood to shrink and expand without splitting, and will prevent the boards from moving relative to one another in the frame.

For the gridwork, the key is to drop it in separately after the gate is assembled. I cut the pieces to fit the opening, and then used a tablesaw jig to make the little interlocking notches I needed to join them together (For more on the jig, visit Finewoodworking.com/Outdoor). To install the gridwork, I simply nailed thin wood strips on both sides of it, like glass stops.

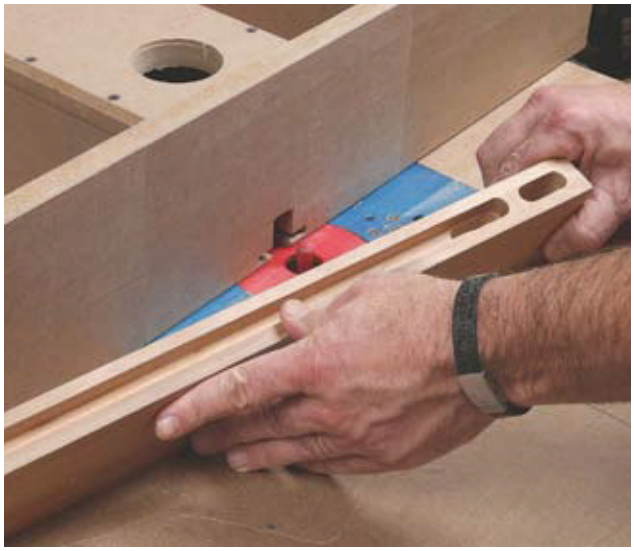
As for the finish, I didn't use any. The cedar will eventually turn gray, as will the pressure-treated wood, blending with the color of the galvanized panels over time.

Before hanging the door, I trimmed its outside edges a little to fit the opening. For hardware, I used a self-closing gate kit from Everbilt, which included spring-loaded hinges and a matching latch. □

Asa Christiana is a freelance writer based in Portland, Ore.

Assembly time

I recommend Titebond III wood glue, which is waterproof for outdoor use and allows ample time for assembly before it starts to cure and seize up.



Don't forget the grooves. *Cut all the panel grooves on the router table with a ½-in. bit, using two passes to reach the full depth. To groove the lower sections of the vertical frame parts, start the bit in one of the mortises, and rout until you reach the next one. The grooves on the rails run straight through, so they are even easier.*

Always do a dry fit first. *Once you're sure all of the joints will close nicely, take the opportunity to round all the inside corners with a router.*

Assemble in stages. *Start by inserting the panel boards into the lower and middle rail, with no glue—but fire a single brad through the rail into each board to keep it roughly in place. Then apply glue to all of the mortises and tenons and add the top rail and stiles. I used bar clamps to draw the joints home, as they get pretty snug once glue is on them.*

Glue goes on mortises and tenons. *Put most of the glue in the mortises, using a brush to spread it. Glue on the tenons tends to get scraped off and squeezed out during assembly, so use only a light coat there.*

Photo, this page: Bruce Wenner

Easy Arbor

Simple construction for a shady place to relax

BY FRANCES WENNER

Beautiful and utilitarian. *This unpretentious arbor provides backyard privacy and planting opportunities galore.*

Vine fever caught me early. My garden dreams were draped and swagged in clematis, roses, and honeysuckle. Out in the garden, I crammed vines onto every inch of fence and over every available structure, whether shrub, picket, or trellis. Still, it was clear that the extravagant roses and muscular wisteria I craved would overwhelm any ordinary garden structure.

These thoughts continued to bubble along in my subconscious until a trip to England provided an unexpected piece of inspiration. While visiting the charming garden adjacent to a small Somerset nursery, I was struck by the beauty and utility of a simple wooden arbor through which the garden path passed. Its rustic good looks complemented the whole garden, and the billowing roses appeared sublimely content. Happily, Bruce, my spouse and chief garden engineer, was with me and took pictures of the structure, including the construction details.

Getting the posts right is essential

Once home, we saw that the obvious place to build our own arbor was along the east boundary of our property. There, it would complete the circle of our backyard design, adding privacy. The spot we chose is unusual in that it occupies slightly sloping ground. Books advised us that the arbor location needed to be level, but because level does not exist on our two acres, we decided to position the arbor where we thought it would look at home and hoped for the best.

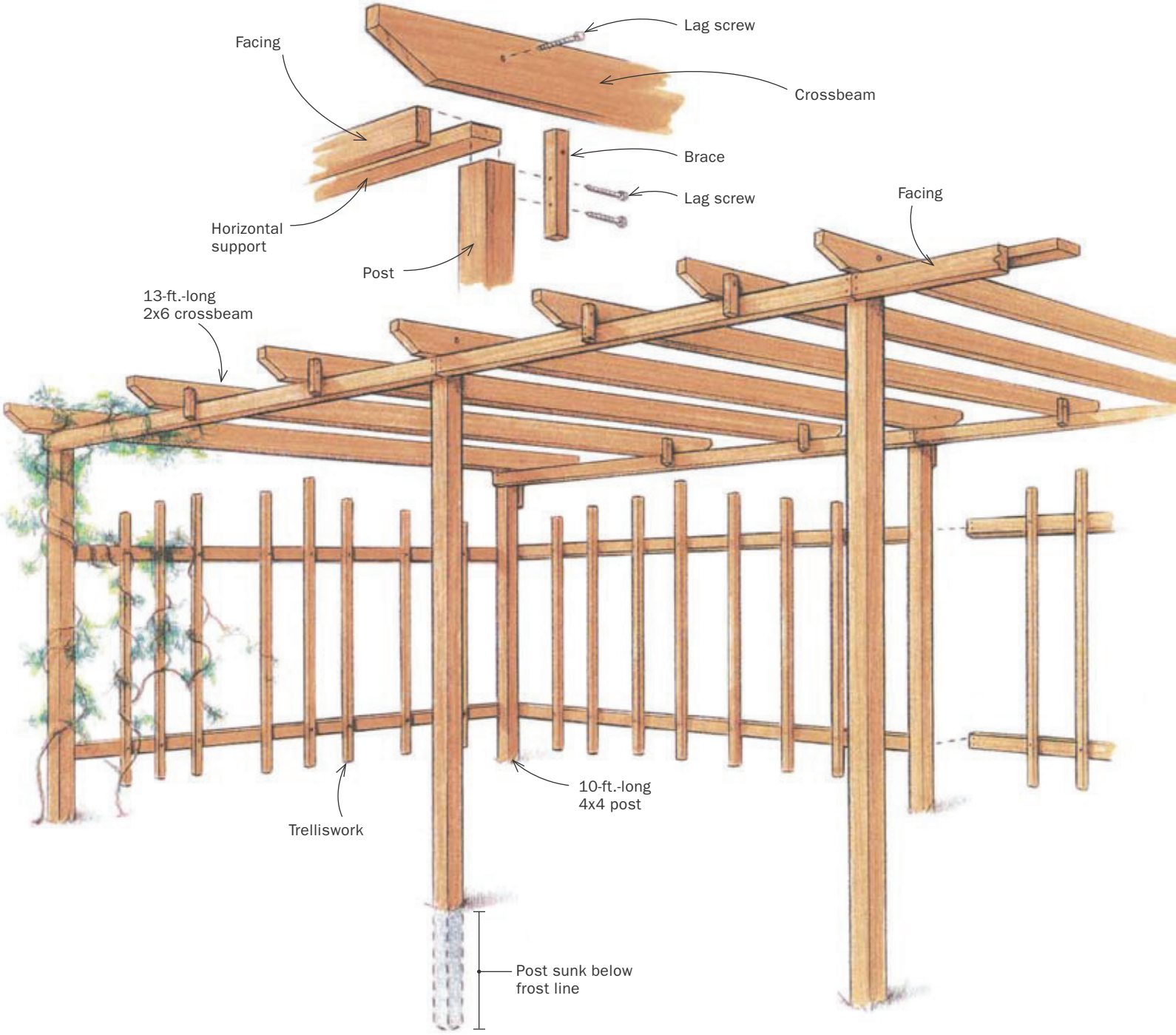
We took careful measurements, purchased lumber and hardware (see the materials list on the next page), and rented a gas-powered auger. We decided to use pressure-treated lumber for the arbor because of its weather resistance. Cedar or redwood would have been good looking and durable enough but also considerably more expensive.

Before beginning construction, we dug 14 holes for the 10-ft. 4x4 posts in two rows of seven, to a depth of 2 ft., which is just beneath the frost line in our area. Check local codes to determine the frost line in your area and sink the posts beneath it. We used the rented power auger to save time and effort, but a muscle-powered post-hole digger or shovel would have done the job. We set the posts in two rows, 11 ft. apart. As we went, we measured to make sure the top of each post was precisely 8 ft. above ground, ensuring that the arbor followed the contour of the land.

The posts were spaced 8 ft. apart on center and topped with 8-ft.-long 2x4 horizontal supports. The supports were laid wide side down, meeting in the center of the tops of the posts. We tacked the supports to hold them in place and then added the facings. The facings were also 8-ft.-long 2x4s, one board for each horizontal support, placed flush with the top outside edge of the horizontal support. Once all of the supports and facings were tacked

A home for climbing plants

Wenner used pressure-treated lumber for all of the arbor components. Posts should be treated because they are sunk into the ground, but cedar or redwood are good alternatives for the other arbor parts.



What you'll need

- **Fourteen 10-ft.-long 4x4 posts**
- **Thirty-six 8-ft.-long 2x4s for horizontal supports, facings, and trelliswork on the arbor back**
- **Two 11-ft.-long 2x4s for the trelliswork on the end posts**
- **Nineteen 13-ft.-long 2x6 crossbeams**
- **Thirty-eight 2x2 vertical braces—24 cut to 7½-in. lengths, 14 cut to 10-in. lengths**
- **Fifty-one 1x2 slats for trelliswork in varying lengths between 5 and 6 ft.**

Photos, except where noted: Frances Wenner; drawings: Bob La Pointe

on, we secured them with 2½-in.-long and ¼-in.-diameter hex-head lag screws. The screws for the horizontal supports were countersunk because the crossbeams were placed directly on top of them.

Crossbeams create a sense of enclosure

A total of 19 crossbeams span the top of the arbor. They are 13-ft. lengths of 2x6s, with both ends cut at 45° angles. One beam is situated over each pair of posts, and in each interval between the posts, two more beams are equally spaced. To secure the crossbeams, we mounted vertical 2x2 braces, cut to 10-in. lengths, onto the back side of each post. More braces, 2x2s cut to 7½-in. lengths, were added to the front of the facing for the beams running in between the posts.

The braces were positioned, their bottoms flush with the bottom of the facing, and fastened with two 2½-in.-long and ¼-in.-diameter lag screws. Then we placed the crossbeams against the braces, securing them with two 2½-in.-long screws

Let a machine do the work for you. *With the help of a rented power auger, set the posts in holes 2 ft. deep. A post-hole digger would also get the job done, but more slowly.*

A sloped spot still works. *Keeping all of the posts at the same height above the ground helps the arbor fit into the landscape.*

Take care of the soil. *Amending the soil with compost and organic matter will help climbers get off to a healthy start.*

through each brace and into the beam. The beams between the posts were secured further with 3½-in.-long lag screws, driven through the horizontal supports and up into the beam.

The final step was to close off the back and bottom end of the arbor with trelliswork. We attached two rows of 8-ft.-long 2x4 horizontal boards to the back of the posts, 40 in. apart, and fastened each with two 2½-in.-long lag screws on each end. Then we added vertical 1x2 slats to form the trelliswork.

The arbor was complete—an empty canvas to paint with plants. While my husband and son worked on the arbor, I prepared beds at the foot of the posts and along the full length of the arbor's back. I amended the soil with as much organic matter as I could lay my hands on, and dug a deep hole at the base of each post for a rose. On the back side of the posts, I dug another hole for clematis. These two plants form the backbone of my composition. □

Frances Wenner has been gardening in the Kansas City, Mo., area for more than 35 years. She writes a gardening column for a local garden bulletin and lectures regularly for several horticultural organizations.

Design the interior, too

In the center of the arbor, we placed a cedar bench of simple design to blend in with the structure and provide a place of repose among the roses. The arbor has become one of our garden's loveliest and most appreciated features.

- **LET CONTAINERS PROVIDE COLOR**

  Flanking the bench, two terra-cotta pots were set on brick platforms and hold long-blooming annuals for summer-long interest. From this spot, we enjoy a cross view of our garden, softly framed by the rose- and vine-clad arbor.

- **USE THE BEDS TO ENHANCE THE ARBOR**

  The beds beneath the posts are filled with an ever-changing array of bulbs and perennials as I search for the best choices to set off the arbor climbers.

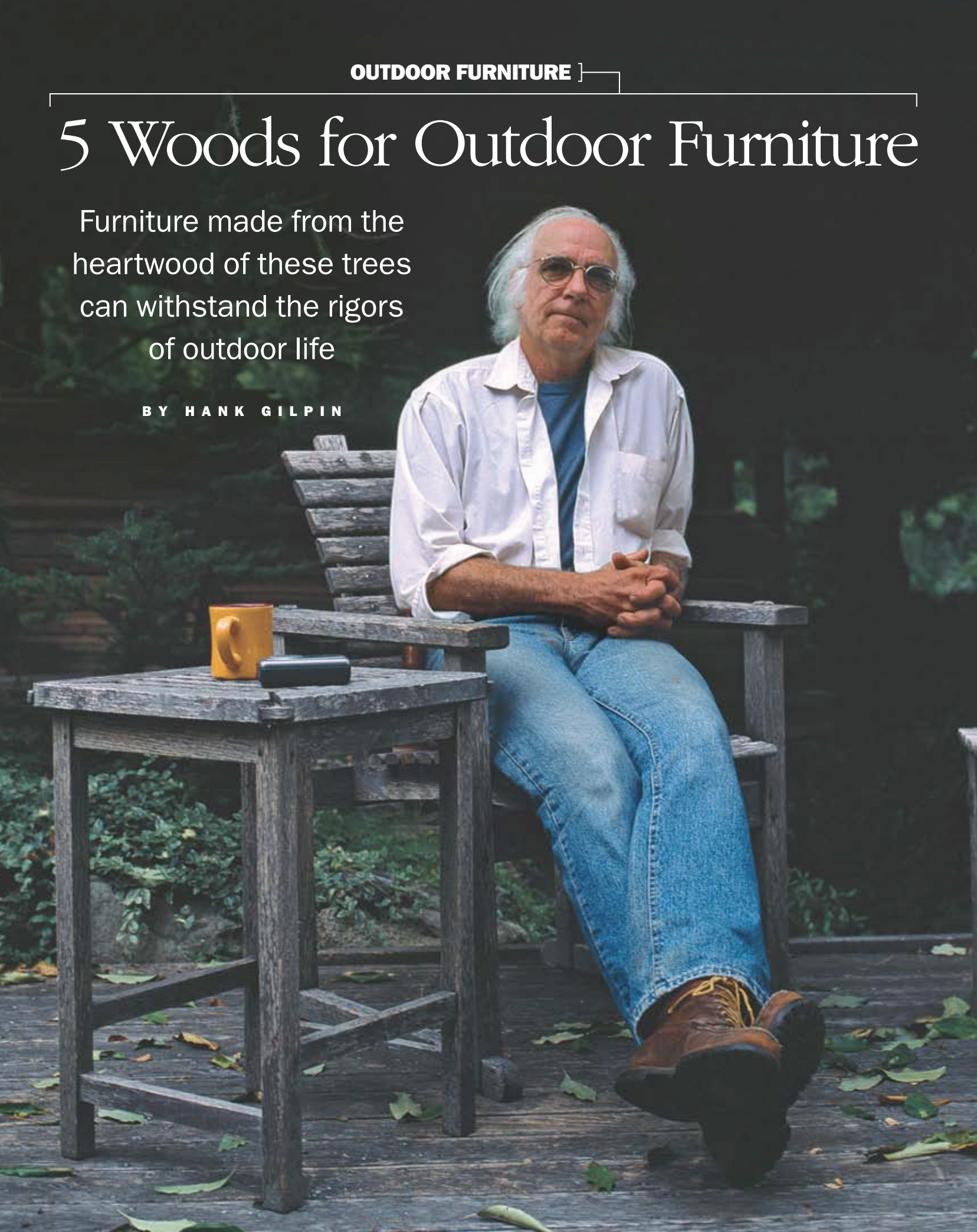
- **EVERYBODY LOVES FRAGRANCE**

  The deliciously scented, pale yellow 'Graham Thomas' honeysuckle (*Lonicera periclymenum* 'Graham Thomas', USDA Hardiness Zones 5–9) twines over the trellis behind the bench, pouring its perfume over the fortunate who pause here to rest.

5 Woods for Outdoor Furniture

Furniture made from the heartwood of these trees can withstand the rigors of outdoor life

BY HANK GILPIN



After a long day in the shop, I like to head out to the backyard, sit back in a chair, and have a cold drink. It's a relaxing few hours for me. But the wood chair beneath me is under constant stress. It's out in the weather all day, every day. And every minute, the elements are working to tear it down. Outdoor furniture won't last forever, but you can greatly extend its life by using the right wood (and the right joinery).

What makes a wood right for the outdoors is its ability to resist decay. I've been making outdoor furniture for decades, and I've used a wide variety of woods to do it. Teak is far and away the best. It resists decay, is very stable, and naturally fades to a beautiful silver-gray. But it also is very expensive, so I don't use it. In fact, I don't use any exotics. There are plenty of domestic species that do great outside. The five that top my list are white oak, black locust, eastern red cedar, northern white cedar, and bald cypress. You should find at least one of these where you live (and you can get the others online).

Regardless of which wood you use, one bit of advice applies to them all. Use only the heartwood for outdoor furniture (and anything else you make for the outdoors). Sapwood is too rich in sugars and other tasty treats to survive very long in the wet, wild, and often warm wilderness out the back door. Fungi, the critters most responsible for decay, tear through sapwood but have a much harder time with heartwood. Wind, rain, and sun also cause decay, but you can mitigate their impact with smart design, like making sure surfaces that face up are sloped to shed water and that exposed end grain has plenty of room to breathe and dry.

Also, applying a finish is a Sisyphean task, and it only delays the inevitable. So, skip the finish, let the wood weather to its natural gray, and relax.

Hank Gilpin is a professional furniture maker in Rhode Island.

White oak

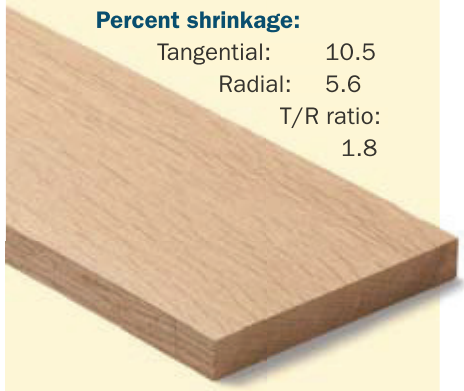
White oak is widely available, much less expensive than teak and other exotics, and withstands the elements for years. The one knock against white oak is that it can be tough to work. Also, be aware that different parts of the growth rings weather differently. The early wood (the part of the growth ring that grows first) is more porous and softer than the late wood, so the surface becomes uneven. To minimize that effect, look for lumber with tight annual rings.

Latin name:
Quercus alba

Average price per bd. ft.: $4–$5
(more for quartersawn)

Specific gravity: 0.68*

Percent shrinkage:
Tangential: 10.5
Radial: 5.6
T/R ratio: 1.8



***BEHIND THE NUMBERS**

A wood's **specific gravity** speaks to how hard, dense, and heavy it is. The higher a wood's specific gravity, the tougher and stronger it is, basically.

The **percent shrinkage** indicates stability. There are three numbers to consider: tangential and radial shrinkage and the ratio of the two. As the ratio gets higher, wood is more prone to warping.

Outdoor design, perfected. *With surfaces designed to shed water, simple but strong joints, and stainless-steel screws, Gilpin's white-oak chair is sure to stand up to the elements.*

Heartwood is the answer to outdoor wood longevity

Sapwood, the outer rings of the tree where cells are still alive, is a tasty treat. This fence post illustrates why you shouldn't use sapwood in outdoor furniture. After just a few years of contact with soil, it has been eaten away. But the heartwood, the durable inner rings where the cells are no longer alive, remains as strong as ever. It's the same story for furniture. Sapwood will rot quickly, leaving you with a weakened or unusable piece of furniture.

Photos, except where noted: staff

Black locust

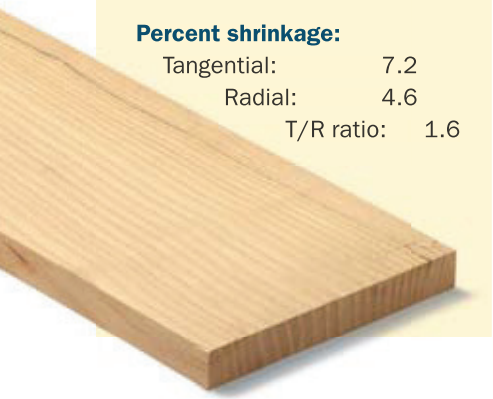
Of all the domestic woods I know—and I know a lot—black locust resists the ravages of fungi and moisture the best. It is the best choice for furniture parts that are in direct contact with the soil. As it never has more than three years' worth of sapwood, there is very little waste. The downside is that it is tough to work. Although it grows just about everywhere, it can be difficult to find because it is only just now appearing on the fringes of the commercial radar. However, with a bit of leg work (try an Internet search) you should be able to find it in your area.

Latin name:
Robinia pseudoacacia

Average price per bd. ft.: $3–$4

Specific gravity: 0.69

Percent shrinkage:
Tangential: 7.2
Radial: 4.6
T/R ratio: 1.6



Legs built to last. *Because the end grain of its slab legs is in direct contact with the soil, Jessica Wickham made this bench from black locust. No other domestic wood is better at handling the stress of constant exposure to dirt, moisture, and fungi.*

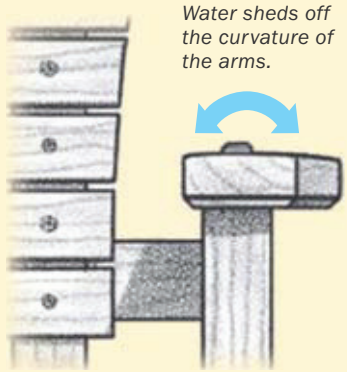
How to build furniture that survives outside

Building durable outdoor furniture isn't only about picking the right wood. It's just as important to build smart. That's because it expands and contracts far more than indoor furniture does.

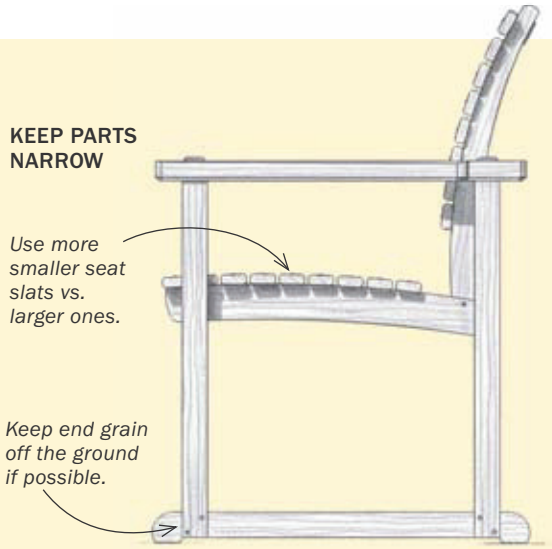
Start by creating surfaces that naturally shed water, such as angled seats. Keep parts narrow and give them enough space to expand and contract. On a seat, for example, six narrow slats are better than four wider ones. Leave end grain exposed where possible; that allows the wood to dry more easily, making it more difficult for mold and fungi to start growing.

When it comes to joinery, simpler is better. Mortise-and-tenon joinery, bridle joints, and lap joints are good choices. Use a waterproof glue, like Titebond III, to hold the joints together, and reinforce them with a peg or two. Or you can forgo traditional joinery altogether and use mechanical fasteners such as bolts and screws made from stainless-steel or brass. Ceramic-coated decking screws work, too.

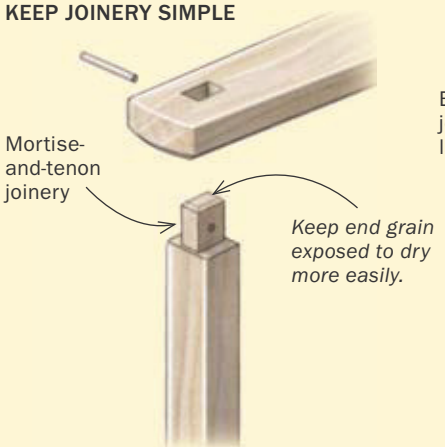
SHED WATER NATURALLY

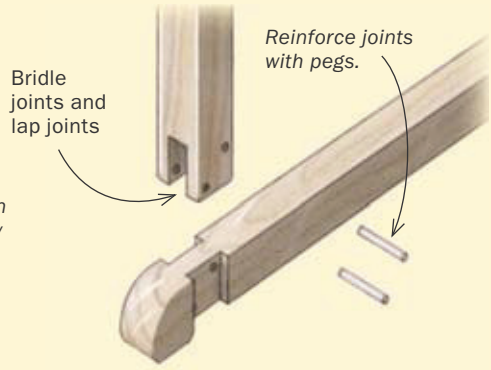


KEEP PARTS NARROW



KEEP JOINERY SIMPLE





Photo, top right: Jessica Wickham; drawings: John Hartman

Bald cypress

A light but durable wood, bald cypress is great for furniture that you need to move around often. It works very well with hand tools, and doesn't clog sandpaper as fast as northern white cedar. However, it can be oily, which makes glue-ups tough. Acclaimed furniture maker Brian Boggs has tested many glues on it and recommends using Oak & Teak Epoxy Glue (glueoakandteak.com), which is specially formulated for oily woods. Bald cypress grows in a fairly large part of the country and isn't difficult to find.

Latin name:
Taxodium distichum

Average price per bd. ft.: $4–$5

Specific gravity: 0.46

Percent shrinkage:
Tangential: 6.2
Radial: 3.8
T/R ratio: 1.6

Bald is beautiful. *Although its parts are beefy, Brian Boggs's chair isn't heavy because it's made from bald cypress. It's no problem to move it from spot to spot, so you're always sitting in the sun (or shade, if you prefer).*

Two cedars

There are two good options with cedar: eastern red and northern white.

Red cedar challenges black locust in terms of durability, and is another great choice for any part that is in direct contact with soil. It's not difficult to work, but is often very knotty. However, if you design with foresight you can locate joinery to miss the knots, or use red cedar only for those parts that touch the ground or are buried in it, and use another wood for everything else (it all turns gray in the end). It grows just about everywhere, but to find it in sizes suitable for anything other than fence posts and wood chips for hamster cages, try local sawmills.

Northern white cedar isn't as decay-resistant as red cedar, but still holds it off for many years. It's light and fibrous, but resists splitting very well. It's perfect for furniture that is brought in and out of storage or otherwise moved around a lot. Don't use galvanized fasteners, which will cause staining. Instead, use stainless-steel, brass, or ceramic-coated deck screws.

Lightweight Adirondack. *There's a lot of wood in an Adirondack chair, which can be very heavy. That's why Tom Begnal made this one from northern white cedar* *(see p. 60).*

Latin name:
Juniperus virginiana (Eastern red)

Average price per bd. ft.: $5–$6

Specific gravity: 0.47

Percent shrinkage:
Tangential: 4.7
Radial: 3.1
T/R ratio: 1.5

Latin name:
Thuja occidentalus (Northern white)

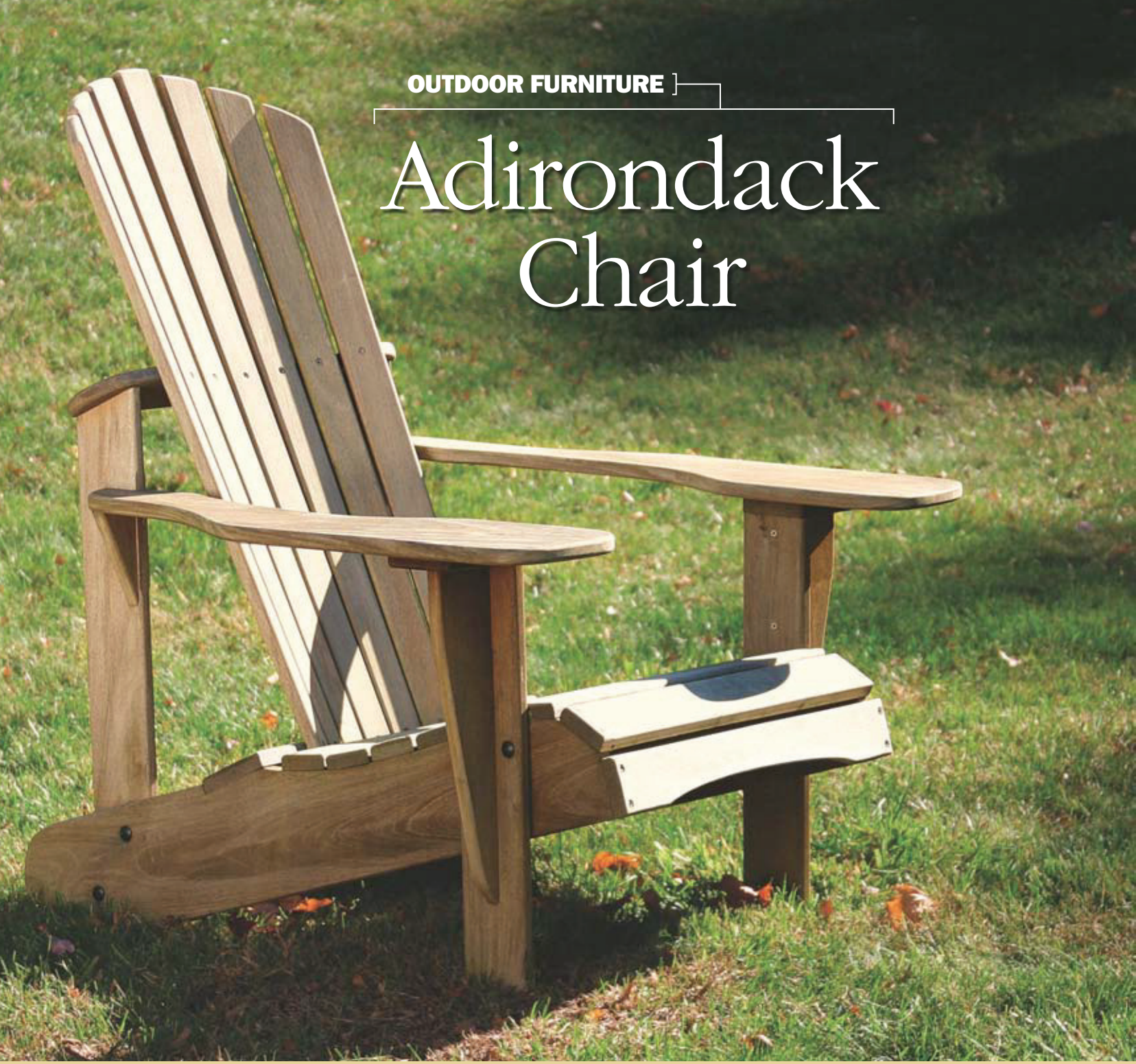
Average price per bd. ft.: $5–$6

Specific gravity: 0.31

Percent shrinkage:
Tangential: 4.9
Radial: 2.2
T/R ratio: 2.2

Photo, top right: Brian Boggs

Adirondack Chair



This take on the classic outdoor chair combines comfort and easy construction

BY TOM BEGNAL

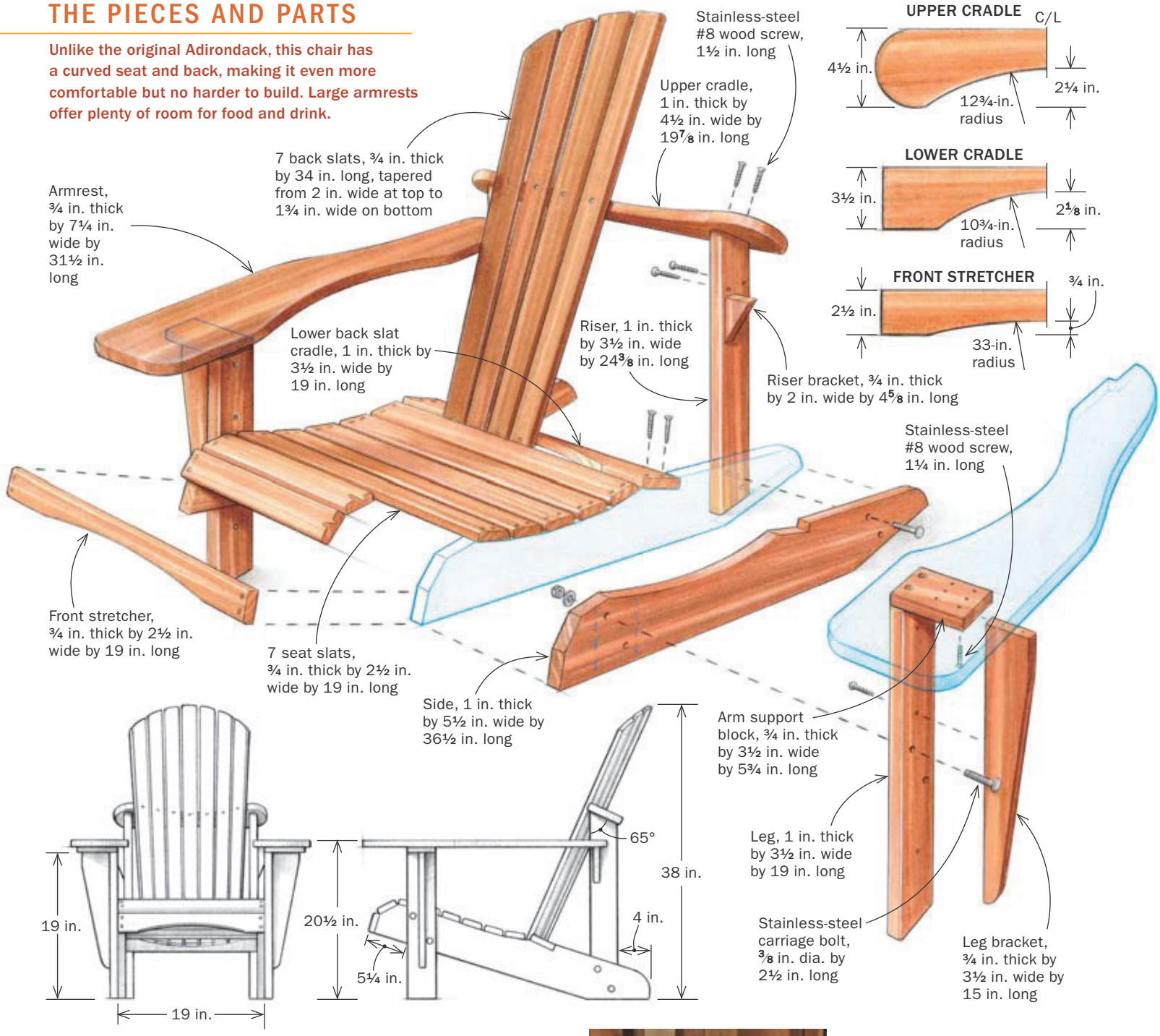
This quintessentially American outdoor chair was born in the early 1900s in the Adirondack mountain region of New York state. The generous slant of the seat and back make it an inviting place to relax outdoors. And for those who like to graze while relaxing, armrests the size of small tables offer plenty of room for a plate of snacks and a favorite beverage.

Unlike the original, our chair has a curved seat and back, making it a place where you won't mind spending a lot of downtime. It is made from western red cedar, a weather-resistant, lightweight wood available at most lumberyards. Cypress, mahogany, and redwood also are lightweight and enjoy the outdoors. Ipé and

Photos, this page: Michael Pekovich

THE PIECES AND PARTS

Unlike the original Adirondack, this chair has a curved seat and back, making it even more comfortable but no harder to build. Large armrests offer plenty of room for food and drink.



teak are at home outdoors, too, but expect a chair made from either to be a muscle-strainer.

Most of the parts are made from presurfaced "1-by" stock, but for the parts that carry extra load—sides, legs, risers, and cradles—I used 5/4 presurfaced stock. Much like a 2x4, the actual dimensions end up slightly less. That said, if you use teak, ipé, or any other hardwood, you can build the entire chair from 1-by boards.

Begin with the sides

The sides are the foundation of the framework. Cut a full-size pattern, then transfer it to the stock, and cut out the shape with a

TIP

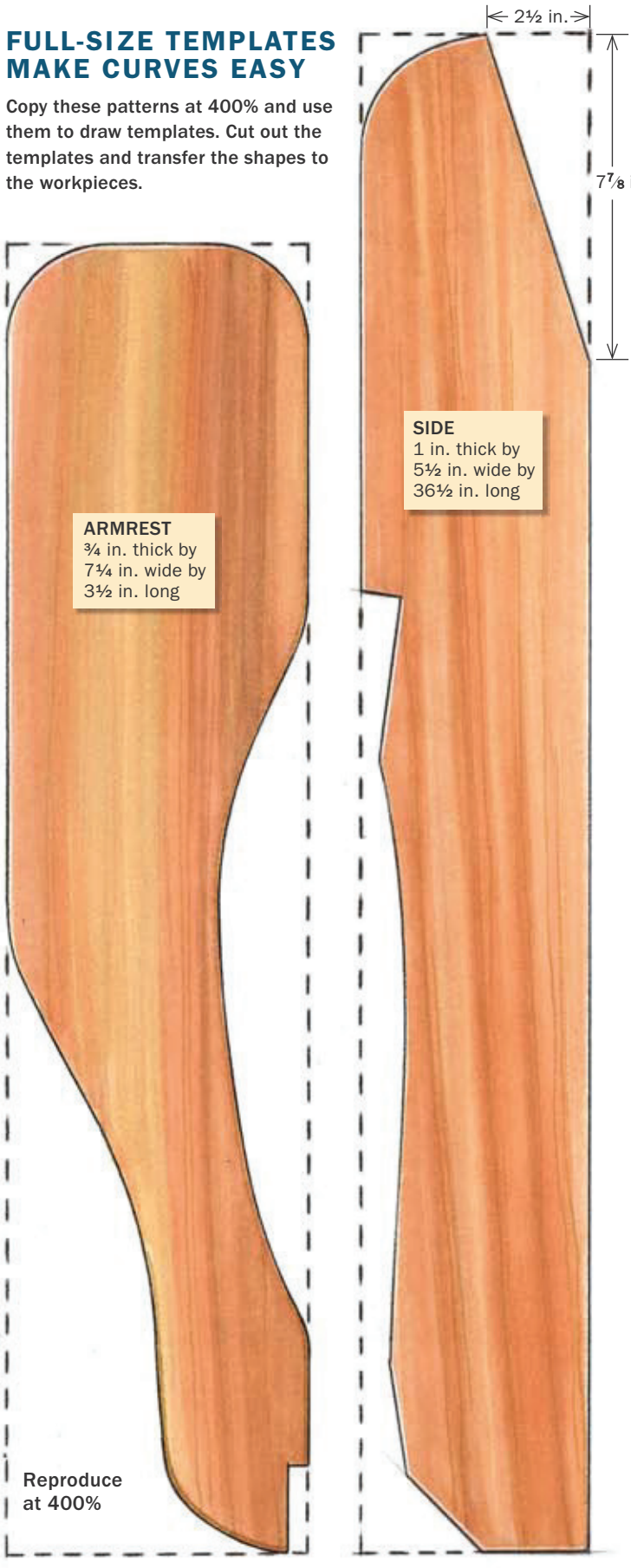
MAKE A JUMBO COMPASS

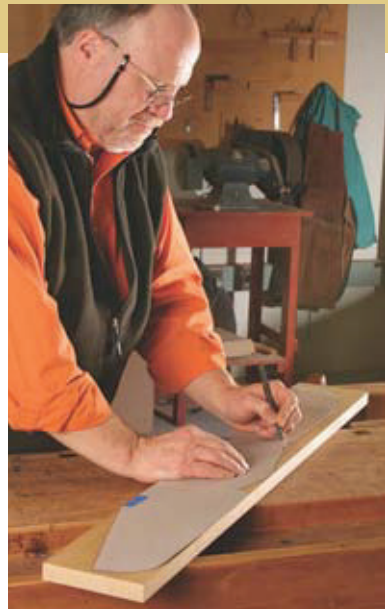
The compass is a thin strip of wood about 36 in. long. Measure 1 in. from the end, and drill a hole to accept a nail. Create a pivot point by driving the nail through the strip and into a square block of ¾-in.-thick stock. The location of the pencil hole will vary depending on the radius of the arc.

BEGIN WITH THE SIDE PIECES

FULL-SIZE TEMPLATES MAKE CURVES EASY

Copy these patterns at 400% and use them to draw templates. Cut out the templates and transfer the shapes to the workpieces.





Trace the shape. *Use a thick-paper template to outline the side shape on stock.*

Tape sides together. *Begnal uses double-sided tape to hold the boards together as he cuts them.*

Keep the parts taped together. *A file, followed with sandpaper, is a good way to smooth the edges of inside or outside curves. Start sanding with coarse paper, say 80-grit, working up to 150-grit.*

jigsaw (or bandsaw, if you have one). Smooth the sawblade marks on the edges of the sides with a plane, scraper, or sanding block.

Cut seat slats, stretcher, and lower back-slat cradle

Cut the seat slats to size before moving on to the front stretcher. To lay out the curve along the bottom edge of the stretcher, make a jumbo compass (see previous page) Measure 33 in. from the compass pivot point and drill a ⅛-in.-dia. hole to accept a pencil point.

Before scribing the curve, add reference points to the stretcher. At a point ¾ in. from the front edge, draw a line across the length of the piece. On that line, mark the center point. Now, place the stretcher on a workbench. Align the pivot point of the compass with the centerline on the stretcher, positioning the pencil on the center point. Use the compass to scribe the arc across the stretcher, use a jigsaw or bandsaw to cut it out, then smooth the sawn edges.

Again, turn to the jumbo compass to scribe the curved front edge of the lower cradle. Relocate the pencil hole to create a 10¾-in. radius. At a point 2⅛ in. from the front edge of the cradle, draw a reference line across the length of the piece. Then, mark the

Photos, except where noted: Anissa Kapsales; drawings: Bob La Pointe

TAPER AND SHAPE THE BACK SLATS

Just saw and smooth. *The back slats taper ⅛ in. on each edge, but you can cut the whole ¼ in. of taper on one edge. Lay out the taper and then cut it with a jigsaw (above) or bandsaw. Then smooth away the saw marks using a block plane (right) or sanding block.*

end-to-end center point on the line and cut the curve with a jigsaw or bandsaw. After that, smooth, sand, and round over the edges.

Move on to the leg assemblies, then the back

Each of the two leg assemblies is made up of a leg, a leg bracket, and an arm-support block. With the parts disassembled, drill all the shank holes in the legs and support block. Use a jigsaw or bandsaw to cut the taper on the bracket, and then smooth with a smoothing plane. Now, sand all the leg parts and round over the edges. But do not round edges where parts meet. Screw one block to the top of each leg. For each leg assembly, screw a bracket to the underside of a block and outside of a leg.

The back assembly is made up of two parts: a pair of vertical risers and a pair of riser brackets. Once the parts are cut, rounded, and smoothed, screw them together. To locate the proper position for the riser brackets, place a leg assembly on the riser with both bottom ends flush, then use the arm-support block as a straightedge to scribe a line across the riser. Position the bracket so that its face is flush with the front edge of the riser and its top edge is at the marked line. Secure each bracket in place by driving three screws through the inside face of the riser and into the bracket.

Make the upper cradle

To create the curved front edge, use the jumbo compass again. This time, though, locate the pencil hole 12¾ in. from the nail hole. Again, add a reference point to the cradle. Draw a line 2¼ in. from the front edge of the cradle, and then mark the end-to-end center point on the line. Use the compass to scribe the arc.

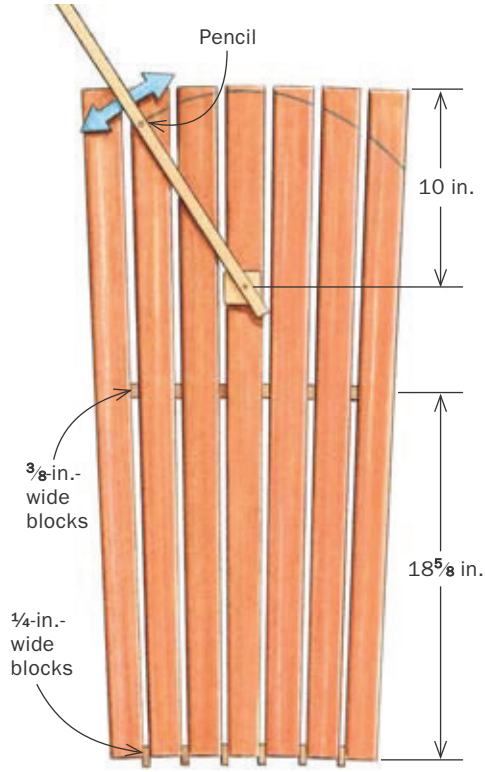
The end curves are next. I experimented with several shapes on the end of a 4½-in.-wide piece of cardboard. When I hit on one that looked good, I cut out the curve and used the cardboard to trace the shape on each end of the cradle. Use a jigsaw or bandsaw to cut them out, and then smooth the sawn edges.

Cut out the arms

The arms are the focal point of the chair. Enlarge the drawing on the opposite page to trace a full-size pattern on stiff paper or

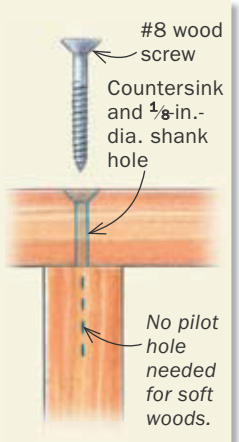
SCRIBE AN ARC ON THE BACK SLATS

After creating the jumbo compass, measure 10 in. from the nail hole and drill a ⅛-in.-dia. hole—a size just big enough to accept a pencil point.



Mark the arc. *A clamp and some light pressure keep the back slats and spacers from shifting while Begnal uses the jumbo compass.*

ASSEMBLE THE BASE



SCREW DETAIL

Make a subassembly. *Screw the stretcher to the front and follow with the lower cradle.*

Add one leg assembly at a time. *Use a spring clamp to temporarily clamp each one to a side piece, then square it to the work surface.*

Secure the leg assemblies. *Once the leg assemblies are in place, drill ⅜-in.-dia. holes through the sides and legs and add bolts, nuts, and washers.*

Online Extra

Tom Begnal walks through the complete assembly process at **FineWoodworking.com/Outdoor.**

cardboard. Cut out the pattern and use it as a template to trace the shape on each length of stock. Then use a jigsaw or bandsaw to cut out both arms at the same time. Smooth the edges, round them over, and sand through 150-grit.

Taper the back slats

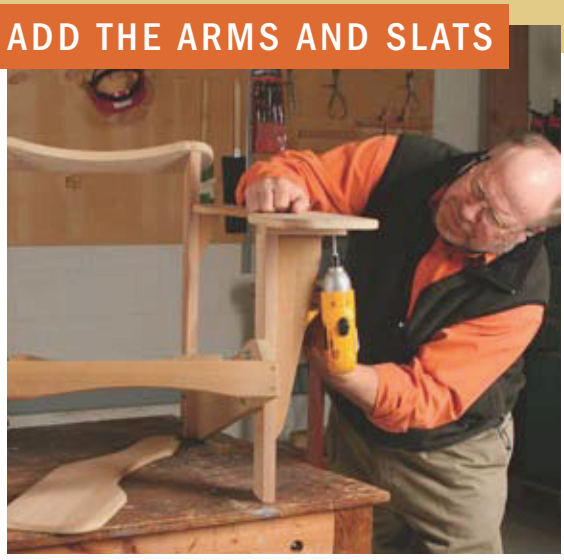
There are a number of ways to taper the seven back slats, including a tapering jig on the tablesaw or bandsaw, but the simplest way is to lay out the taper in pencil and make the long cut with a jigsaw. Then just sand the edge to remove saw marks.

When the tapered slats are done, you can trace the top curve on all seven of them. Start by placing them edge to edge with a pair of spacers between each. Redrill the pencil hole on the jumbo compass 10 in. from the nail. Position the pivot point 10 in. from the top end of the slats and centered on the middle slat. Scribe the arc across all the slats. Cut out the curved ends with a jigsaw or bandsaw. Sand each sawn edge and sand the faces through 150-grit before rounding the edges.

Now you're ready to trace the top curve on the back slats. Start by placing all the back slats edge to edge with a pair of spacers between each. Redrill the pencil hole on the jumbo compass

Attach the upper cradle. *Use a temporary spacer board to ensure that the risers stay parallel when the upper cradle is attached.*

ADD THE ARMS AND SLATS



Drive the riser screws *(at the back) first to be sure the arm notch fits snugly around the riser. Begnal conceals the screws by driving them in from the inside of the riser and the underside of the support block.*

Position the back slats. *Start with the center slat, then the two end slats, and work your way in. The slats must be aligned at the bottom of the lower cradle, with even spacing between them.*

Layout trick. *Place the chair on its back and use spring clamps to level it. This will allow you to rest the slats on the cradles and adjust positioning without slippage.*

10 in. from the nail. Position the pivot point 10 in. from the top end of the slats and centered on the middle slat. Scribe the arc across all the slats.

Cut out the curved ends with a jigsaw or bandsaw. Sand or scrape each sawn edge and sand the faces through 150-grit before rounding the edges.

Assemble all the parts

You are ready to start putting the chair together. Stainless-steel screws (countersunk) and carriage bolts eliminate the need for glue. Start the assembly by screwing the stretcher to the front end of each side piece. With the stretcher mounted, add the lower back-slat cradle to give some rigidity to the subassembly.

Now, on each side piece, mark a line 5¼ in. from the front face of the stretcher. Elevate the stretcher until the back ends are flat on the work surface. Then place a leg against the side piece, and use a square to make sure it is square to the work surface and on your mark. Add a clamp to make sure it won't inadvertently shift out of position as you drill a pair of ⅜-in.-dia. holes through the legs and sides. Bolt the leg in place, then attach the other leg.

With the legs safely at first base, the back assembly is now at bat. At a point 4 in. from the back end of the side, clamp a riser to a side piece. Check for square with the work surface, then drill the holes and add the bolts. Follow the same procedure for the second riser.

The upper cradle is next. Position the cradle so that its back edge is set back ¼ in. from the back edges of the risers. Measure and drill for a pair of shank holes at each end of the upper cradle.

After you attach the upper cradle, add the arms, as it becomes a chore to attach them once the back slats are in place. Position each arm so that the notch fits around the riser, and screw through the riser and arm-support block.

The back slats are attached to the lower and upper cradles. I attach the center slat first, then move to the two outside slats and work inward. Before drilling the shank holes, it is important to align them from left to right, up and down, and keep the spacing even to maintain a nice curve on the bottom and the top.

Seat slats are the final step. *The seven slats are attached at each end. The ⅜-in. spacers between each slat make placement a snap.*

Give the entire project a quick once-over with 150-grit sandpaper, and break any sharp edges. You can leave the chair unfinished and let it weather naturally. Or, three coats of spar varnish provide a finish that will hold up well in an outdoor environment. A fresh coat every couple of years should keep the chair happy and fit for decades to come. □

Tom Begnal is a woodworker in Kent, Conn.

Modern Outdoor Chair

If you can use screws and glue, you can make this classic piece

BY AIMÉ ONTARIO FRASER

This funky outdoor chair has a lofty pedigree. It's based on the Red Blue Chair, designed by Gerrit T. Rietveld in 1917. However, because every part is straight and almost every angle is 90°, it's not difficult to make. Also, there is no joinery to cut. Instead, all of the parts are held together by screws and epoxy, a tough waterproof adhesive that's very forgiving. It bridges gaps between imperfect joints, making a powerful, water-tight connection that's stronger than the wood itself. The screws provide the joints' foundation of strength and act as clamps to hold the joints together while the adhesive dries.

Strong joints aren't the only thing that make this a chair that will last through many seasons. It's made from ipé, a dense tropical hardwood often used for outdoor decks and railings. It has a beautiful, dark color and is very strong. Best of all, you can buy the boards you need for the chair at a local home center or a lumberyard that sells decking materials.

And as sophisticated as this chair looks, you don't need a lot of tools to make it. All you really need is a chopsaw (or circular saw, or even handsaw) and drill. I'll show a simple but reliable way to locate the joints—you won't even need a ruler—and a jig that ensures the parts go together square.

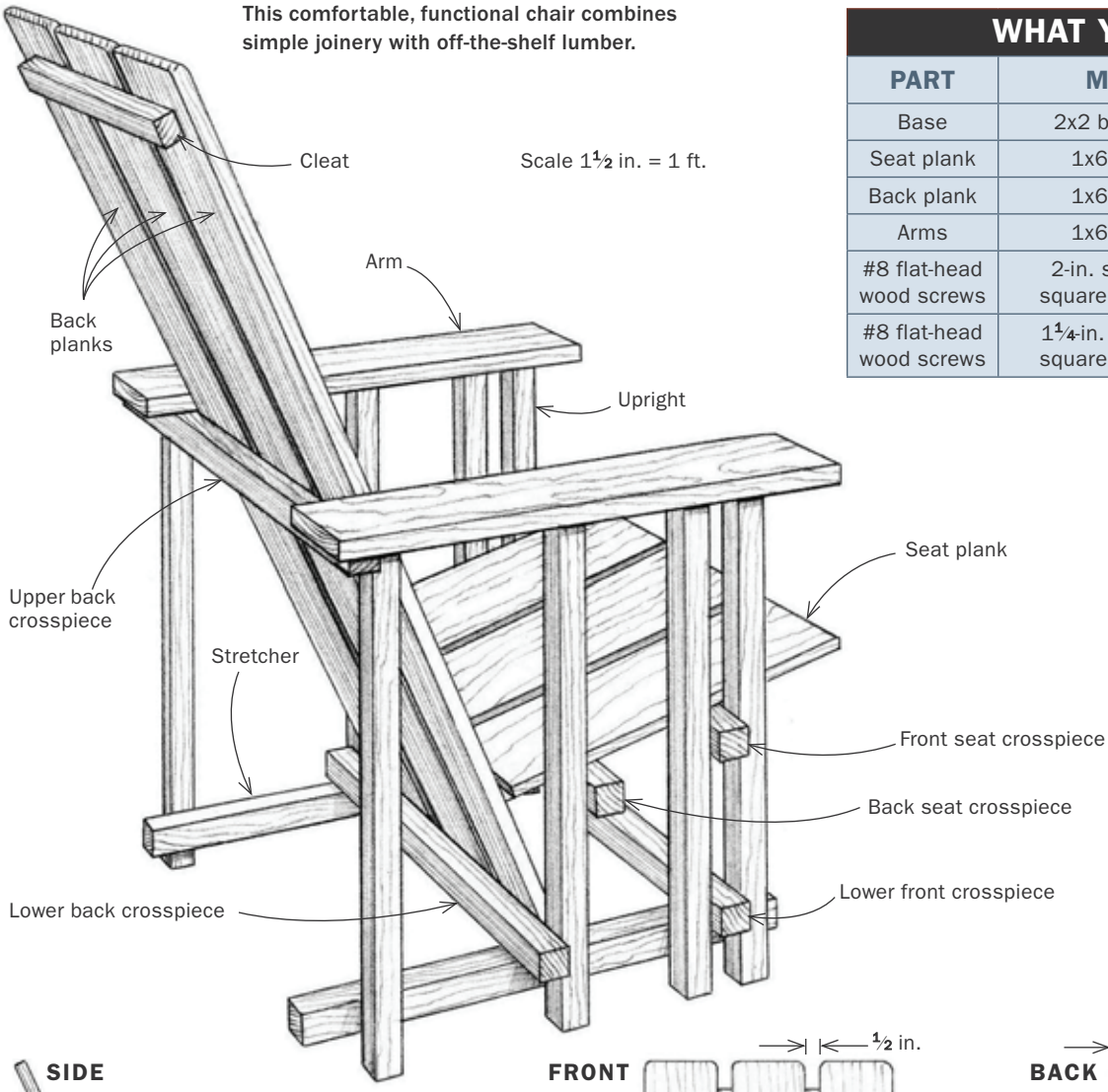
Cut the parts to length

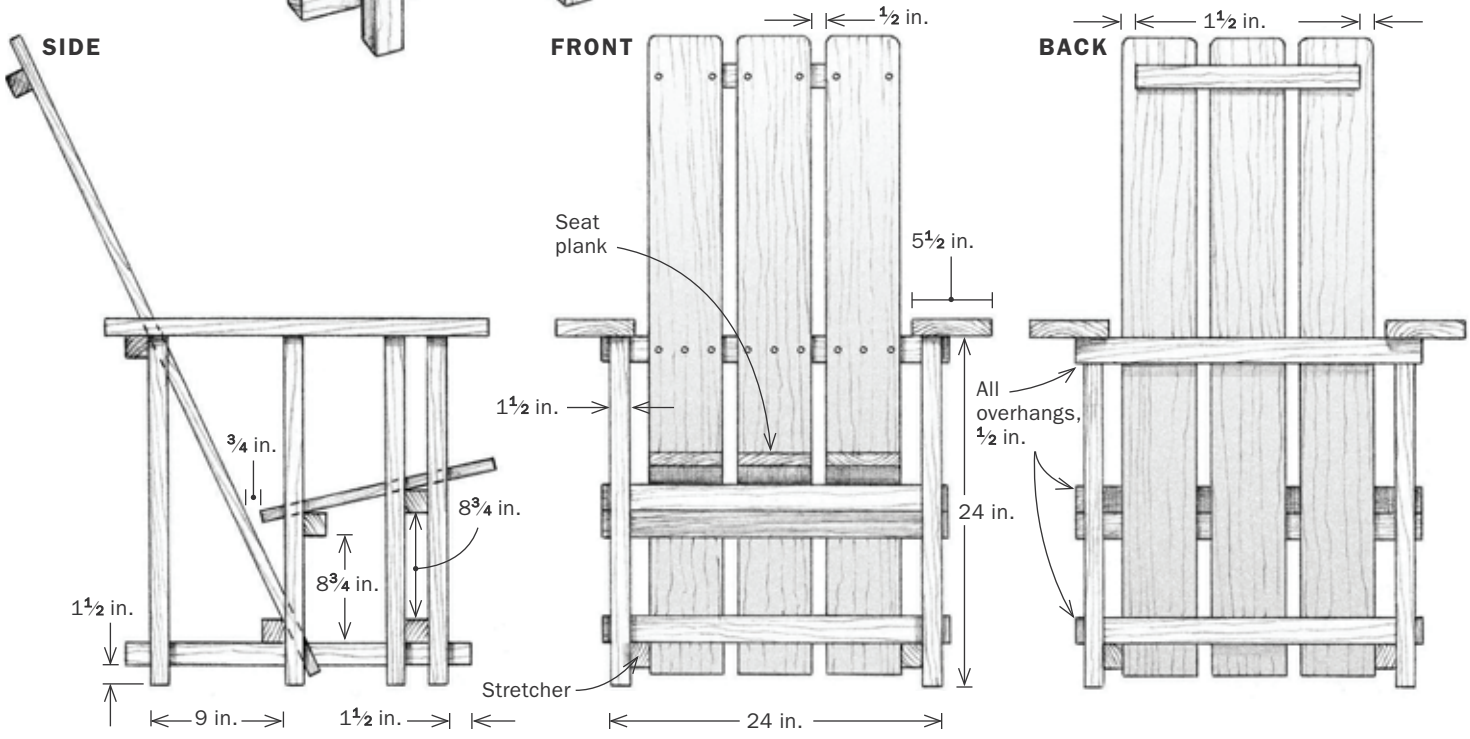
Because this chair is made from lumber that is already milled to the thicknesses and widths needed for the parts, you only need to cut the shorter parts from the longer boards. It is important that when you cut the parts to length that similar parts end up exactly the same length. If a few of the uprights are shorter than the others, for example, the chair could wobble or the arms attached to their tops might not be at the same

Comfort and style

This comfortable, functional chair combines simple joinery with off-the-shelf lumber.

WHAT YOU'LL NEED		
PART	**MATERIAL**	**QUANTITY**
Base	2x2 balusters, 4 ft.	9
Seat plank	1x6, 18 in. long	3
Back plank	1x6, 48 in. long	3
Arms	1x6, 27 in. long	2
#8 flat-head wood screws	2-in. self-drilling tip, square drive preferred	1 box
#8 flat-head wood screws	1¼-in. self-drilling tip, square drive preferred	1 box





Photos: Sloan Howard; drawings: Melanie Powell

Layout

Avoid measurement mistakes by putting away the ruler and using an offcut to locate the joinery instead.

Align the parts. *Push the ends of the ganged boards against an offcut. Now you can lay out all the boards at once and end up with accurate joinery.*

height. To avoid problems like those, use a stop block on your miter gauge or chopsaw when you're cutting the parts to final length. The block attaches to the gauge's (or saw's) fence. The distance between it and the blade is determined by the length of the part you are cutting. The end of the board goes against the stop. Make the cut, remove the part, slide the board down to the stop block, and cut the next part. You can quickly cut a number of parts of identical lengths without measuring each one individually. Use the stop block to cut all of the parts to final length, working through them in sets: the uprights all at once, the crosspieces all together, etc.

Lay out the joints without measuring

After all of the parts are the right length, you're ready to begin assembling the chair. But to do that, you have to know where the joints are. You can locate almost all of the joints using two 8¾-in.-long spacer blocks made from the 2x2 material left over after you've cut the uprights, stretchers, and crosspieces to length.

The idea behind using these spacer blocks instead of a ruler or tape measure is that you'll make fewer mistakes. You can easily misread a ruler or tape. With the blocks, you use their width and length to lay out the joints, so there is little chance that you'll make a mistake.

The front upright, for example, is located 1½ in. in from the end of the stretcher. That's how wide the spacer blocks are, so to find the joint's location, just clamp the stretchers together and place one edge of the spacer block flush with the ends. Use the other edge of the block to draw a line across the stretchers. That's where the joint starts. Now put the second spacer block against the first and draw a line along its other edge. That marks the joint's width. The distance from the first upright to the second one is equal to the spacer block's width, so just jump the first block over the second one and use it to find the edge of the second joint (see photos on this page).

The length of the spacer block is used to locate the seat crosspieces. For the front seat crosspiece, stand the spacer block on the lower front crosspiece that rests on the stretchers (use both spacer blocks, one on each side of the chair), then put the front

Mark the first joint. *One offcut, flush with the end of the boards, is used as a spacer and to mark the first side of the joint. A second offcut marks the joint's width. A clamp prevents the parts from becoming misaligned.*

Then mark the second one. *One offcut spaces the second joint from the first, and the second offcut determines with the width of the joint. Draw hatch marks over the joint area to prevent confusion.*

Base assembly

This chair is really just a bunch of sticks glued and screwed together, but it has tremendous strength because all the joints combined make for a rigid frame.

Set the countersink. *The top of the screw should align with the top of the angled section of the countersink.*

Drill the holes. *Arranging them on a diagonal creates a joint that resists racking much better than if they were in line with one another.*

Then apply glue. *Spread it on both halves of the joint and keep it confined to the area where the two parts touch.*

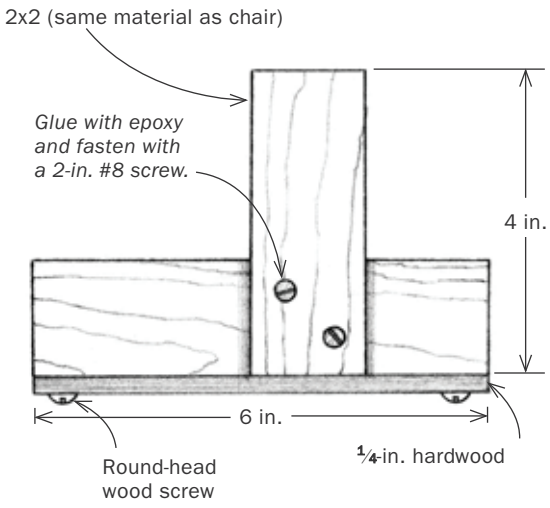
Upright jig

This simple jig takes all the fight out of locating the uprights. It keeps the bottoms of the uprights in line and ensures they are perpendicular. It also makes it easy to get the correct spacing between the first and second uprights.

Clamp the jig to the stretcher (below). In most cases, you'll be able to drive the screws as shown, but you may have to hold the upright to the jig or even clamp them together.

Two-job jig. *Not only does it keep the uprights and stretchers square, it also sets how far the "feet" extend.*

JIG FOR POSITIONING UPRIGHTS



Attach the upright to the stretcher. *If the upright begins to lift, clamp or hold it down.*

The sides are mirror images of one another. *This is an important fact to keep in mind as you begin to assemble the sides. If you make them identical, the chair won't go together properly.*

Attach the lower crosspieces. *Clamp the joint so that the two parts don't separate as you drive in the screws. Support the far end with an offcut or extra crosspiece.*

seat crosspiece on the spacer block. The back seat crosspiece is done the same way, except that the spacer blocks stand directly on the stretcher. It ends up 1½ in. lower than the front one and when the seat planks are screwed down, they have a nice backward slope to them.

The only place you can't use the spacer blocks is to locate the third upright from the front on the stretcher. Instead, measure from the back upright with a ruler or tape measure. You can eliminate mistakes, however, by measuring when the two stretchers are still clamped together and marking both at the same time.

Chair goes together with screws and glue

After laying out the joints on the stretchers for the uprights, you should begin to assemble the chair. Start with the stretchers and uprights. Then, join the two sides with the crosspieces. The back, seat, and arms are attached last.

All of the joints are made the same way, with screws and glue. Although the screw heads are eventually covered by pegs, you should still use a screw designed for outdoor use, like a ceramic-coated deck screw. You can find them at home centers. As for the glue, use epoxy. It's strong and water resistant. Combined, the screws and epoxy make a very strong joint.

For every joint, clamp the two parts together first, and then predrill holes for the screws. Use a countersinking drill bit, so that for each screw you end up with a pilot hole in both parts and a countersink for the screw head. The countersink should be deep enough that the entire screw head is 3⁄16 in. to ¼ in. beneath the

Set the distance between sides. *For the chair to end up the correct width, attach the crosspieces so that they extend ½ in. beyond the uprights.*

Use a spacer to locate the raised crosspieces. *Its length matches the distance between the stretcher and crosspiece. Used at both ends, it guarantees the crosspiece is level.*

Back and arms

The back and arms, along with the seat, not only finish off the chair, but also tie together all the parts, making them a unified whole that's stronger than the sum of its parts.

Mark for the back. *This shows where to predrill the back for a screw. Use a spacer to set the distance between the back planks.*

Drill pilot holes for the cleat. *But don't create countersinks. Those go on the other side.*

Attach the arm. *Drill the countersinks with the arm in place so that the holes are located accurately. Use plywood to set the overhang.*

surface. Later, you'll glue in a plug to cover the screw. For the uprights and crosspieces, the joints should all have two screws each. To improve the joint's strength, arrange the screws diagonally.

It's important that the uprights are square to the stretchers and that they all extend the same distance beneath the stretcher. To help with both, make an alignment jig. It's a simple jig (two short cutoffs screwed to one another at a right angle and a piece of hardboard for a fence), but it works great.

Here's one more thing to watch out for when you're assembling the chair. The two sides must be mirror images of one another and the uprights should be on the outside edge of the stretchers. So, when you screw the uprights to the first stretcher, start at the stretcher's right end and have that be the front end. For the second side, start at the stretcher's left end and have that be its front end.

Attach the back before the seat. The bottom ends of the back planks are raised up off the ground. Use one of the spacer blocks, placed on its side on your bench or shop floor, to set that gap. The gap between the seat and back is set by placing an offcut from a back or seat plank between the two before you screw the seat planks down.

Finally, after the chair is completely assembled, use store-bought plugs to fill the countersinks. Glue them in with epoxy and then pare them flush with a chisel.

Protect the end grain

End grain can be a real problem on outdoor furniture. It soaks up water faster then face grain and it also dries out faster. That can lead to splitting. On this chair, most of the end grain is left exposed and won't give you any trouble. But the bottoms of the uprights are in contact with the ground and that can lead to rot

Three places to attach the back. *A cleat at the top and crosspieces at the middle and bottom hold the back planks together.*

Finishing

Ipé is a tough wood, but to get the longest life from your chair, cover the screw holes and saturate with epoxy the ends of the uprights that sit on the ground. Adding a finish prevents the wood from turning gray, but it needs a yearly refreshing.

Cover the screws with face-grain plugs. *They shed water better than end-grain plugs (buy them at a home center). Glue them in with epoxy.*

Soak the end grain with epoxy. *It will take more than one coat, but once the pores are clogged, water can't get in and the legs will last longer.*

very quickly. To ward off that problem, saturate the bottoms of the uprights with epoxy. At first the epoxy will soak in, so keep adding it until it begins to pool. Wipe off the excess and let the epoxy dry. Now the legs are ready to withstand many years of rain, heat, cold, and everything else the great outdoors can throw at them. □

Aimé Ontario Fraser, of Norwalk, Conn., is a former associate editor of Fine Woodworking. *This article is excerpted from her book,* Getting Started in Woodworking *(2003, The Taunton Press).*

Pare them flush. *To prevent the edge from digging into the surface, turn the chisel over and ride the bevel.*

Brush on a finish. *Fraser applied a thin coat of an oil/varnish mixture using an inexpensive brush and added a second coat after about eight hours.*

OUTDOOR FURNITURE

Bench with Asian Flair

Teak and strong joinery guarantee a long life

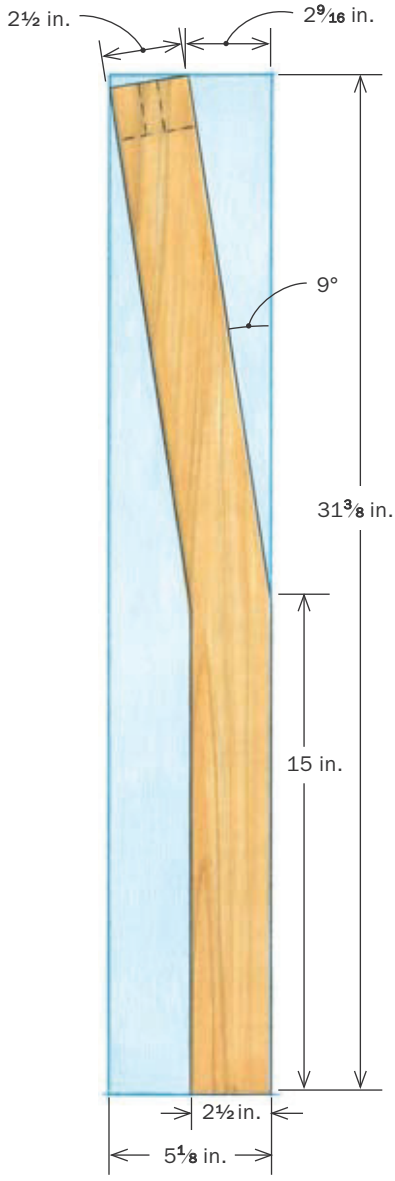
BY RUSSELL JENSEN

A client approached me about a Tudor-style garden bench I had made for the local university. She loved the bench, but wanted something more Asian in style. So, I decided to incorporate a curved back rail and armrests as well as tapered back splats with a cross rail between them. The final design is a blending of Asian aesthetics and traditional Tudor style. The curved top rail, armrests, and tapered splats are very reminiscent of Buddhist temple gates in Japan, while the straight, chunky front legs and angled back legs are strictly Tudor.

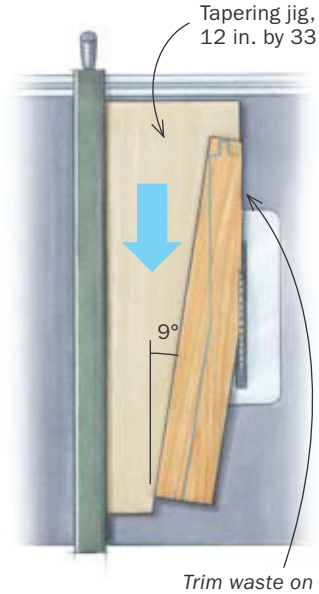
Since this is an outdoor bench, I used teak. Highly weather resistant, teak is my first choice and is worth the expense and extra care it takes to work, but there are less-expensive woods such as Spanish cedar, white oak, ipé, and jatoba that also work well outdoors. This bench is built almost entirely with mortise-and-tenon

Photos, except where noted: Anissa Kapsales; this page: Russell Jensen

SHAPE THE REAR LEGS



Use a tapering jig for the front angle. *After cutting close to the line on the bandsaw (left), make a simple tapering jig to clean up the cut on the tablesaw (below).*



Make stop cuts on the back. *Jensen cuts close to a pencil line, and then turns off the saw before removing the piece and flipping it to cut the other end (left). A quick stop at the spindle sander cleans up the waste that remains (below).*

joints, and because there are so many, you'll need an efficient way to crank them out. I'll demonstrate a simple template-guide jig for the mortises, and time-tested methods for making tenons to fit. Even though teak can be tricky to glue, the combination of mortise-and-tenon joinery and marine epoxy ensures the bench will last.

Choosing and milling the stock

I made the bench out of 1-in.-, 1½ in.-, and 2-in.-thick teak. Start by rough-cutting the lumber a couple of inches longer than you need. All the 2½-in.-thick parts, such as the legs, arms, and curved back rail, are made of 1½-in. stock glued together with West System epoxy. I do this because 3-in.-thick teak is expensive and hard to find, but it is a good idea regardless of the wood. When choosing stock for the rear leg, steer away from using plainsawn stock on the front

of the leg, as this will result in an unattractive, stepped-grain pattern when the angle is cut.

After gluing the legs, arms, and rear rail, allow the epoxy to cure and then mill all the lumber to thickness. Now true up all the edges on the jointer and rip everything to width. To give yourself a little play when cutting out the patterns, leave about ¼ in. extra on the width of the curved pieces and tapered back splats.

Shape the rear legs

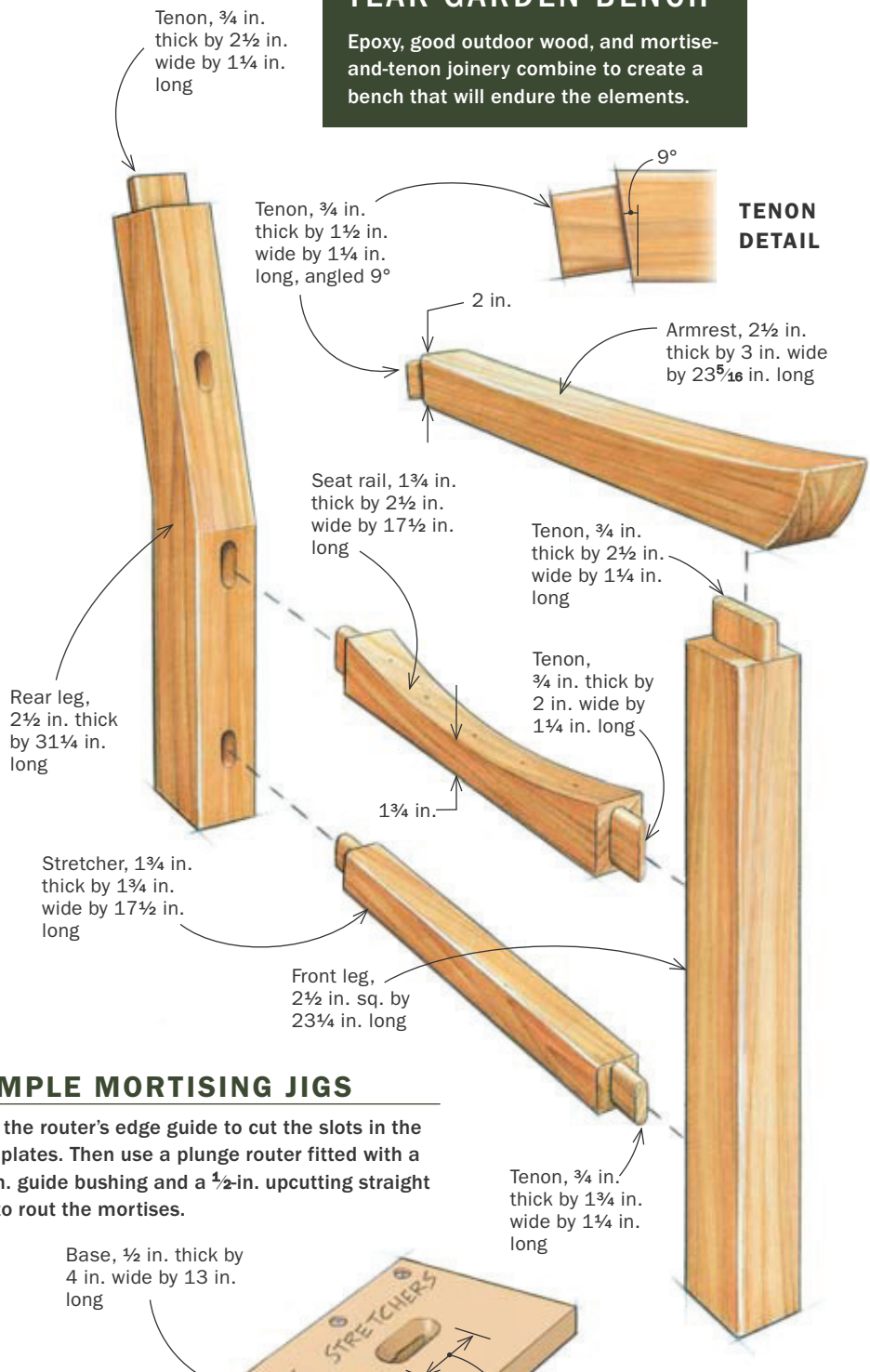
The straight, square front legs are easy to mill and lay out. The rear legs are more of a challenge. First, lay out the shape on the blanks. Then rough out the front angle at the bandsaw, staying 1/16 in. proud of the line. Now use a shop-made tapering jig on the tablesaw (see photo, previous page) to cut a clean taper. Even though the bandsaw is an extra step, removing most of the waste first makes for a cleaner and, more importantly, safer tablesaw cut. Next, rough out the back of each leg at the bandsaw, followed by a series of stop cuts at the tablesaw to clean up the bandsaw marks and size the leg to 2½ in. The material that is left can be cleaned up with hand tools or at the spindle sander. With the rear legs cut to shape, cut them to length.

Quick, accurate mortises with a router

There are 40 mortises of four different lengths in this bench, but you can simplify the process using two easy-to-make jigs. Most of the

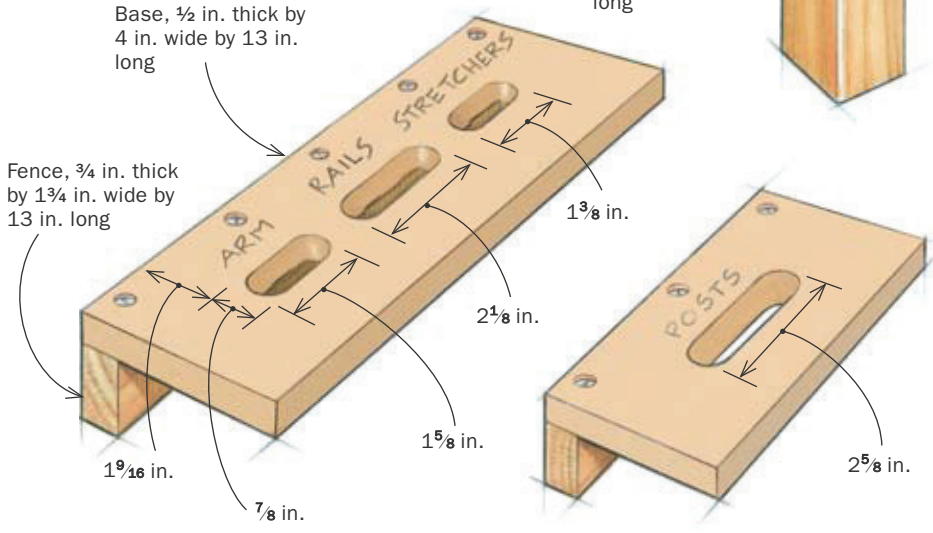
TEAK GARDEN BENCH

Epoxy, good outdoor wood, and mortise-and-tenon joinery combine to create a bench that will endure the elements.

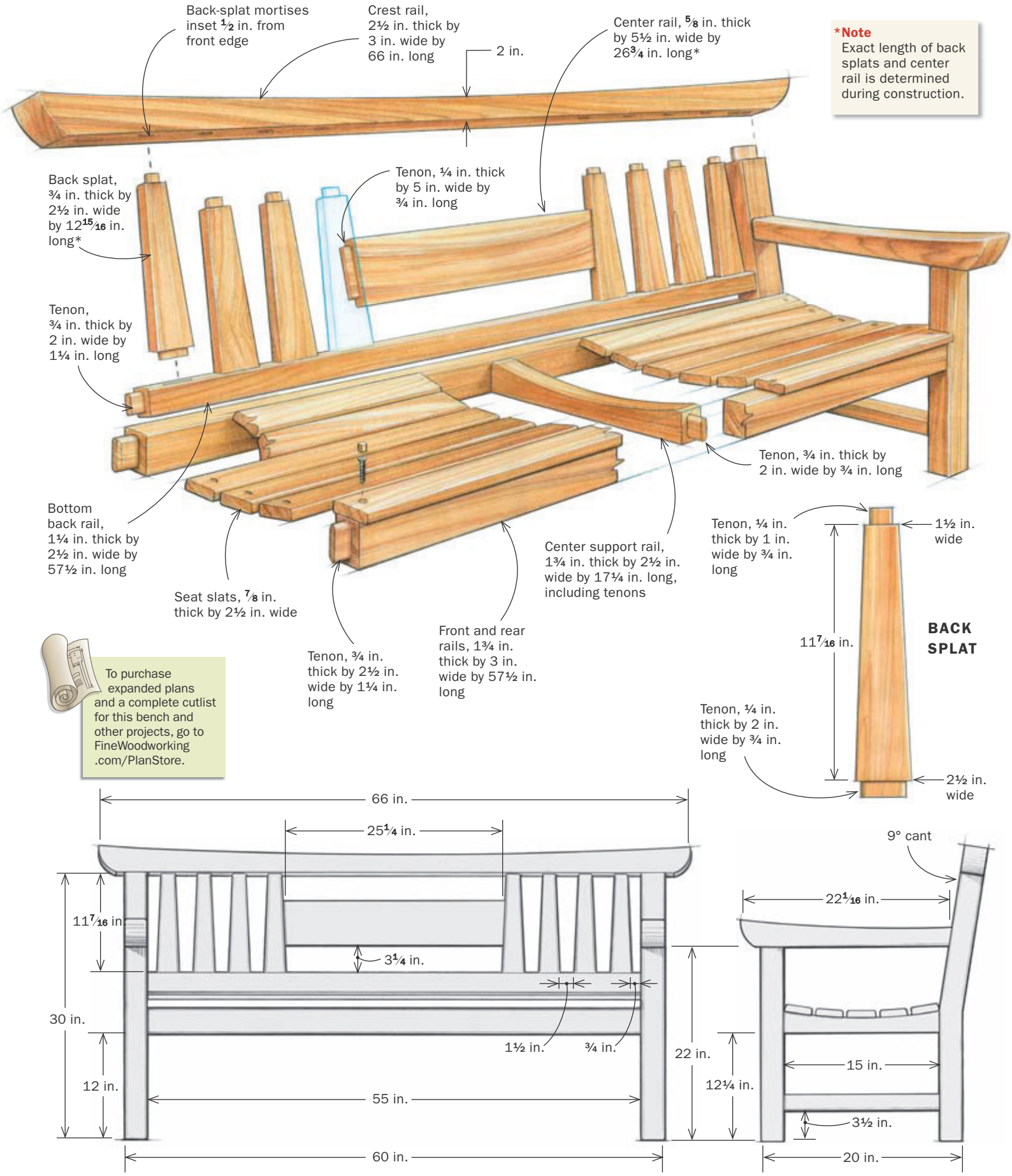


SIMPLE MORTISING JIGS

Use the router's edge guide to cut the slots in the templates. Then use a plunge router fitted with a 5/8-in. guide bushing and a ½-in. upcutting straight bit to rout the mortises.



Drawings: Bob La Pointe



*Note
Exact length of back splats and center rail is determined during construction.

To purchase expanded plans and a complete cutlist for this bench and other projects, go to FineWoodworking.com/PlanStore.

CUT ANGLED TENONS ON THE ARMRESTS

Cut stock to size. *Use a miter saw to cut the blank to size with a 9° angle at the tenoned end.*

Cut the shoulders and cheeks. *Place the angled end against the rip fence to set the miter-gauge angle and cut the shoulders. Then cut the cheeks using a tenoning jig, keeping the end flat against the tabletop.*

Move to the bandsaw. *Once you've cut the cheeks and shoulders, use the bandsaw to make the angled cuts at the top and bottom of the tenons and a handsaw to trim the remaining material.*

MORTISE, THEN SHAPE THE CREST RAIL

Mortise for the back splats. *A plunge router equipped with a guide fence makes cutting these mortises a snap (above). To lay out a graceful curve on the top edge (right), Jensen puts a clamp on each end, rests a strip of MDF against the clamps, and pulls the strip back, clamping it in place at the center.*

mortises are ¾ in. thick, located where the legs meet the arms and where the legs meet the stretchers. I use jigs for these.

Sixteen smaller mortises join the back splats to the top and bottom stretchers that make up the back assembly. I make these by carefully laying them out and then outfitting my plunge router with an edge guide.

Once you have marked the mortises on all four legs, use a router equipped with a template guide and a jig. Each jig is ½-in. MDF with a hardwood fence screwed to it, and a corresponding slot routed in the MDF for each different-size mortise (see drawing). To make the jigs, mark the MDF and plunge the router in and along using the router's guide fence. Because I use a ½-in. upcutting spiral bit and a ⅝-in. template guide to make the ¾-in. mortises, my template holes have to be ⅛ in. longer and wider than the actual mortise. Making accurate jigs is essential to creating perfectly centered mortises, so testing them on a piece of scrap is always a good idea.

Rounded tenons for routed mortises

For the tenons, start by making the shoulder cuts on the tablesaw. Clamp a short stop block to the rip fence, and set the tenon length from the stop block to the far side of the blade. The block keeps the piece away from the fence as you make the cut and prevents a dangerous binding or a crooked cut. After adjusting the blade height, make all the shoulder cuts, then use a shopmade tenoning jig to make the cheek cuts. I cut the tenons to height on the bandsaw and complete the top and bottom shoulder cuts with a handsaw, cleaning up any roughness left from the handsaw cuts with a sharp chisel.

When making the back shoulder cut on the top of the rear leg, elevate the leg with a ¾-in. shim so the lower, angled part of the leg doesn't interfere with the cut.

To fit the tenons in rounded mortises, make four small chisel incisions where the shoulder meets the corners of the tenon, and round over the corners with a rasp.

Angled armrests are a fun challenge

Making the armrests is tricky, due to the angled tenon that fits into the rear leg mortise. First, set a miter saw at 9° and cut off

MAKE THE SPLATS

Real-world measurement. *Dry-fitting makes it easy to measure the exact shoulder-to-shoulder dimensions of the back splats.*

Taper the back splats after cutting the tenons. *Use two jigs to create the tapered back splats. The first holds the square splat and the second (shown) holds the splat that has one side already tapered.*

the end of the blank where the tenon ends. Then move to the tablesaw. Instead of relying on the angle gauge, use the angle on the end of the arm blank, resting it against the stop block and angling the miter fence to meet it. Then cut the shoulder on both arms, adjust the miter gauge to the other side of 9°, and cut the other shoulder. Next, bring the arms to the tenoning jig, lay the 9° angle flat on the table, clamp it into the jig, and cut the tenons. Again, lay out the width of the tenon and cut it freehand on the bandsaw. Then remove the waste with a handsaw and round the edges with a rasp.

Curved pieces create an Asian feel

Now you are ready to cut the curves for the armrests and crest rail. Again, careful layout is the key. With a pencil, draw the shape directly on the stock. Create the radius at the ends with a compass. For the long curves, I simply bend a thin piece of MDF, held back by clamps, and trace the line. Step back and look at the lines, redrawing them until they look good.

Once I have settled on the shape, I cut it close to the line on the bandsaw, and then finish at the spindle sander or with a sanding drum on the drill press. If you are unhappy with the smoothness of the curve after using the spindle sander, some aggressive sandpaper, a slightly curved sanding block, and good old-fashioned elbow grease will smooth out the curve nicely. When I have to make two identical parts, like the armrests, I work one at a time, using the first piece as a pattern for the second. I do this because the stock is thick. Ganged together, it measures 5 in., and I can only sand up to 4 in. with my spindle sander.

Mark the center rail. *Add the tapered back splats to the dry-fit assembly, and clamp the center rail in position so you can mark its tenon shoulders.*

Use two jigs to taper the back splats

I dry-fit and clamp the whole bench except for the armrests. Doing this allows me to measure for the back splats. I can determine their exact length from shoulder to shoulder, cut the tenons while the pieces are still square, and then create the taper. After I've accurately measured the size of the back splats, I make the tenons using the same method used previously.

The center rail is joined to the two center splats with a mortise and tenon. It is easier to cut the mortises in the two center splats before proceeding with the tapers. This

GLUE UP IN STAGES

Start with the ends. *After cleaning the joints with acetone (teak's oily properties make this a necessity), Jensen glues and clamps the two end sections (above). The easiest way to glue and assemble the bottom rail, the seat rail subassembly, and the two ends is on end (right). Then tip the bench upright and clamp.*

is accomplished the same way as the other mortises for the back splats. Lay out the position of the mortises on the two center splats, use double-sided tape to attach the piece to a larger block of wood (to safely balance the router), and cut the mortises. Once the mortises are complete, cut the tapers in the splats using tapering jigs. Keep a couple of the cutoffs from the tapering process to help out when gluing the center rail to the two splats.

Join the center rail to the back splats

Even though teak is very stable, I still like to make the center rail from a quartersawn piece that has the grain running as perpendicular to the face as possible. This offers a clean look and also minimizes expansion and contraction of the tenon.

Once you've added the tapered back splats to the dry-fitted bench, mark where the bottom of the center rail will intersect with the two back splats. Align the two lines to the bottom of the center rail, clamp it to the splats, and trace out the two inside angles with a very sharp pencil. Transfer that same angle about 1/16 in. past where the tenon will end and cut off that angle at the miter saw. Now you can proceed to make the shoulder cuts and tenons the same way as on the angled tenon of the armrest. Cut the tenons to final length after they are made.

Support rail eliminates flex in seat

Because the bench has a span of almost 5 ft., it is essential to mount a support rail to stop excessive flex under the seat slats. The center support rail is essentially the same as the two end rails, but is 3/4 in. longer because it goes directly from the front rail to the back rail, rather than front leg to back leg as the end rails do.

For the mortises, refit the jig used for the end support rails. Unscrew the wooden fence on the side of the jig and then calculate where it needs to be attached above the guide hole. Find the center on the insides of the front and back rails of the bench, clamp the jig down, and rout the mortises. After you have made the tenons on the blank, find the center on it and one of the end support rails. Put them together, lining up the center marks, and transfer the curve onto the center rail. You can

Glue the center rail to the center back splats. *Jensen uses the cutoff pieces from the tapering process to create a square clamping surface (above). The tapered back splats, center rail, and crest rail complete the glue-up (right).*

then proceed to cut out the curve at the bandsaw, and take it down to the line at the spindle sander.

While the bench is still clamped, predrill and counterbore for the seat slats. This will be almost impossible after the armrests are glued in place.

Before gluing up the bench, I put a ¼-in.-radius roundover on all the exposed edges, being careful not to rout past the points where one piece joins another (I mark these transitions during the dry-fit). Rough transitions can be cleaned up with hand tools after glue-up.

Glue the bench in sections

I use slow-curing West System epoxy to glue the bench together. Its 50- to 60-minute open time eliminates drama in the workshop. I recommend breaking the glue-up into a few sessions.

Glue up the two ends first. Since some of the mortises intersect, it's important to lay down the assembly so that no epoxy gets into the adjoining mortises.

The next step is to glue the two long seat rails and the lower back rail into the two end pieces. This step requires three 6-ft.-long clamps.

Now, to prepare for the final assembly, glue the center rail to the two center splats. You can use the two cutoff pieces saved from the tapering process on the outside tapers to provide a square surface to clamp. Glue the center support rail to the front and back seat rails. After this has dried for 24 hours, clean up any squeeze-out with a sharp chisel. The final gluing is to join the tapered back splats and the curved top rail. This is where the slow-cure epoxy really comes in handy.

Now you can screw the seat slats into place with 1½-in. stainless-steel screws and use a tapered plug cutter to make plugs for the counterbored holes. Glue the plugs into place and let them dry before cutting them flush to the seat slats.

Teak is a fascinating wood. Incredibly durable, it can survive outdoors untreated for decades. In fact, left unfinished it becomes more beautiful as it ages. Because of this, I leave the bench as is, except for "painting" the bottoms of the legs with epoxy to ensure that no water wicks into the end grain. □

Russell Jensen is a furniture maker in Sudbury, Ont., Canada.

Plug the screw holes. *After screwing the seat slats down, glue in plugs, then cut them flush.*

Seal the legs. *Seal the bottoms of the legs by coating them with the same epoxy used in the glue-up.*

Curvaceous Ipé Garden Bench

Clamps and screws put a bend in this dense and durable wood

BY TRIP RENN

As the owner of a company, I have two functions: one, fretting; and two, saying,"Yes, we can do that." Fortunately, the high quality of my crew keeps the fretting to a minimum and has so far bailed me out of all the unlikely projects I have said yes to. This project was no exception. Frequent clients Susan Sharpe and Nancy Duffner initiated an extensive landscaping project and asked us to handle the woodwork. The plans called for two curved benches made of ipé. The faces and ends of the bench would be 2x6, and the centers would be 1x4.

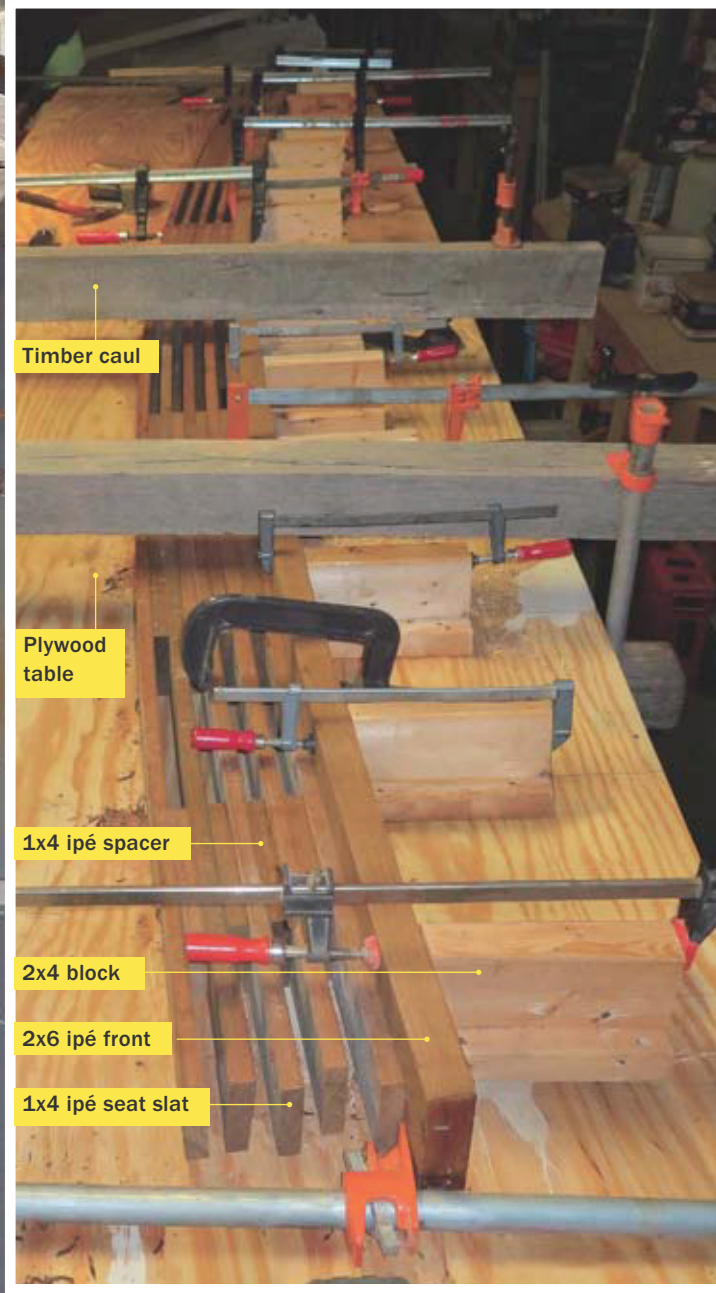
My initial reaction was that it would be a piece of cake to bend 12-ft. ipé 2x6s and create a bent lamination by screwing it to the 1x4 layers. For the bench to straighten itself out, each piece of the lamination would have to move in relation to the pieces on either side of it. By fastening the laminations so that they couldn't move in relation to one another, the bench as a whole would retain the curve. I didn't take into account how much ipé would resist bending.

Wrestling with ipé

The plans called for a 12-ft. bench and an 8-ft. bench, and they gave the curve as increments of deviation from a straight line at every foot of the length. My crew and I used this to position clamping blocks on a ¾-in. CDX plywood table. The blocks themselves were 2x4s screwed together in a T-shape. Their 5-in. height was perfect, and they provided a wide enough base to screw to the table. The plan was helpful, but the curves also could have been laid out on the plywood using a fairing stick. A fairing stick is a thin piece of clear, straight-grained wood that bends to the curve

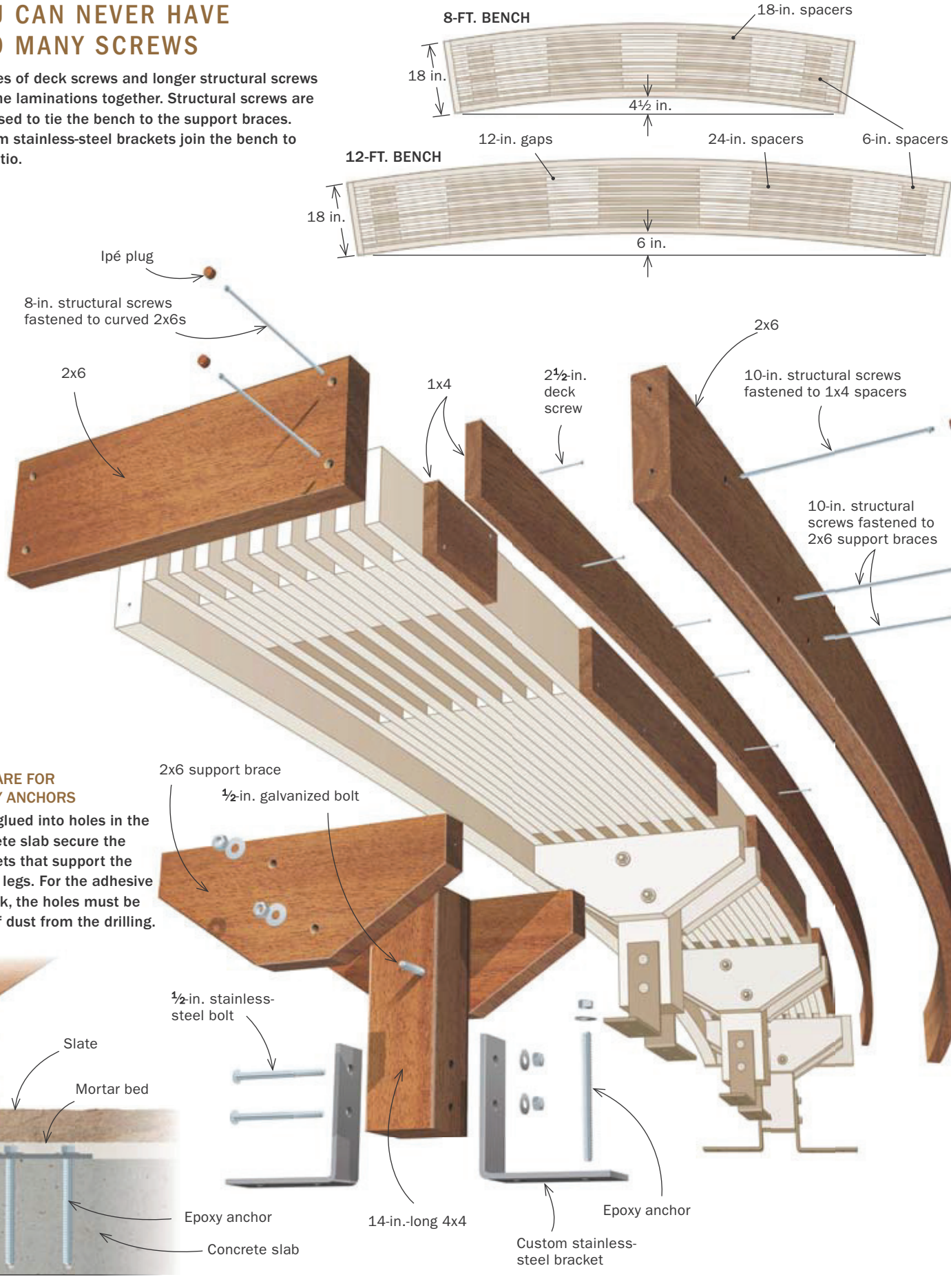
YOU CAN NEVER OWN TOO MANY CLAMPS

To bend the ipé, clamps hook on 2x4 blocks that are screwed to the bench-top. After each layer is clamped to the previous one, deck screws installed through pilot holes lock the laminations together.



YOU CAN NEVER HAVE TOO MANY SCREWS

A series of deck screws and longer structural screws lock the laminations together. Structural screws are also used to tie the bench to the support braces. Custom stainless-steel brackets join the bench to the patio.



PREPARE FOR EPOXY ANCHORS

Bolts glued into holes in the concrete slab secure the brackets that support the bench legs. For the adhesive to work, the holes must be free of dust from the drilling.

Photos: Trip Renn; drawings: Trevor Johnston

Drilling the legs. *Because there might be slight variations in the elevation of the slab, the holes in the legs for the bracket bolts are drilled on site, where accurate measurements can be taken and transferred.*

you're trying to achieve. Often, a string is used to adjust and fix the curve, just like on an archer's bow.

My education in the obstinacy of ipé began with my attempt to bend the first 2x6. I clamped one end of a 12-footer to a block that was screwed to the benchtop. When I brought the opposite end about halfway to the other end block, the first block ripped from the table and whipped across my little shop.

My crew saved me from my initial optimism. They strengthened my clamping table, using more screws to affix the clamping blocks and clamping the 2x6 to the table itself. Then we began laying up the pieces of ipé that comprise the bench: the 2x6 front (inner curve), followed by 12-ft. 1x4s alternating with 1x4 intermittent spacers. Finally came the 2x6 back (outer curve). All of the members ran long and were cut to length later. The 2x6s had to be clamped down with heavy timber cauls to counteract their tendency to lift off the table as they bent.

My brother-in-law, a fine cabinetmaker and furniture builder, has always rolled his eyes at my meager clamp collection. He's right, of course, but my collection was improved significantly by the additional clamps purchased for this project. Overall, we probably used 20 clamps. Bessey deep-throat clamps were useful for reaching over the 2x6s, but Jorgenson I-beam clamps afforded the greatest pressure, and we also used a few Pony pipe clamps. Both the Jorgenson clamps and the pipe clamps bent under the force we applied—and one of my pipe clamps now sports a severe bend.

Screws, not glue

Ipé's density and oily surface made glue's performance questionable. Also, outdoors is a demanding environment for any glue; we felt that mechanical fasteners would do the job as well or better. For fasteners, we relied on six 2½-in. ceramic-coated decking screws through each 24-in.-long 1x4 spacer, and into the layers behind. This means each 1x4 is fastened through to the two layers preceding it with a pair of screws at each end and two middle screws that alternate high and low. We reversed the pattern of the middle screws on succeeding layers. Of course, the first 1x4 layer was attached to the 2x6 with shorter, 2-in. screws, so they wouldn't come out of the face. We drilled pilot holes with DeWalt tapered countersink bits. Ipé is so demanding that we burned up a bunch of bits, and despite the pilot holes, broke off many screws.

The sequence: clamp the layer, drill, screw, unclamp, place and clamp the next layer, and so on. When the lamination was fully assembled, we reinforced it by driving 10-in. FastenMaster hex-head structural screws into each group of spacers—one from the front and one from the back. These aren't supposed to need pilot holes, but again, this is ipé, so we drilled, then countersunk and plugged the holes.

Ready for the masons. *With the brackets affixed to the legs, the bench is turned over. The next step is installing the adhesive anchors. Finally, the masons will return and lay the patio stone under the benches.*

We let the laminations run long, marked the ends with a framing square, made the cuts with a 12-in. circular saw, sealed the end grain with AnchorSeal, then capped the ends with 2x6s. Finally, we eased the edges with a ⅛-in.-radius roundover bit in a router, sanded everything with a random-orbit sander, and applied several coats of Penofin.

Holding up the benches

Custom stainless-steel brackets join the benches' 4x4 posts to the patio's underlying concrete slab. We coordinated with the landscaping contractor and installed the stainless-steel brackets with bolts epoxied into the concrete, which the masons then laid slate around. The 4x4s bolt to these brackets and are held slightly above the slate. This helps to prevent moisture from wicking into the end grain. □

Trip Renn owns Actual Size Builders in Chapel Hill, N.C.

OUTDOOR FURNITURE

One-Hour Garden Bench

Make it with the simplest tools, and get years of service

BY ROB WOTZAK

Every backyard could use a few more places to sit. Perhaps you have an out-of-the-way nook that could benefit from a simple perch for visitors, or maybe your neighborhood barbecues have outgrown your patio set. In either case, a simple homemade bench is a fitting solution.

This classic 4-ft.-long bench is inexpensive and easy to construct with a few basic tools. It costs less than $30 in materials and will take about an hour to build. And I think that once you see the result, you'll want to make half a dozen more.

Rob Wotzak is a carpenter in New Milford, Conn.

What you'll need

TOOLS

- Tape measure
- Pencil
- Handsaw
- Circular saw (optional)
- Speed Square
- Electric drill with screwdriver bit

MATERIALS

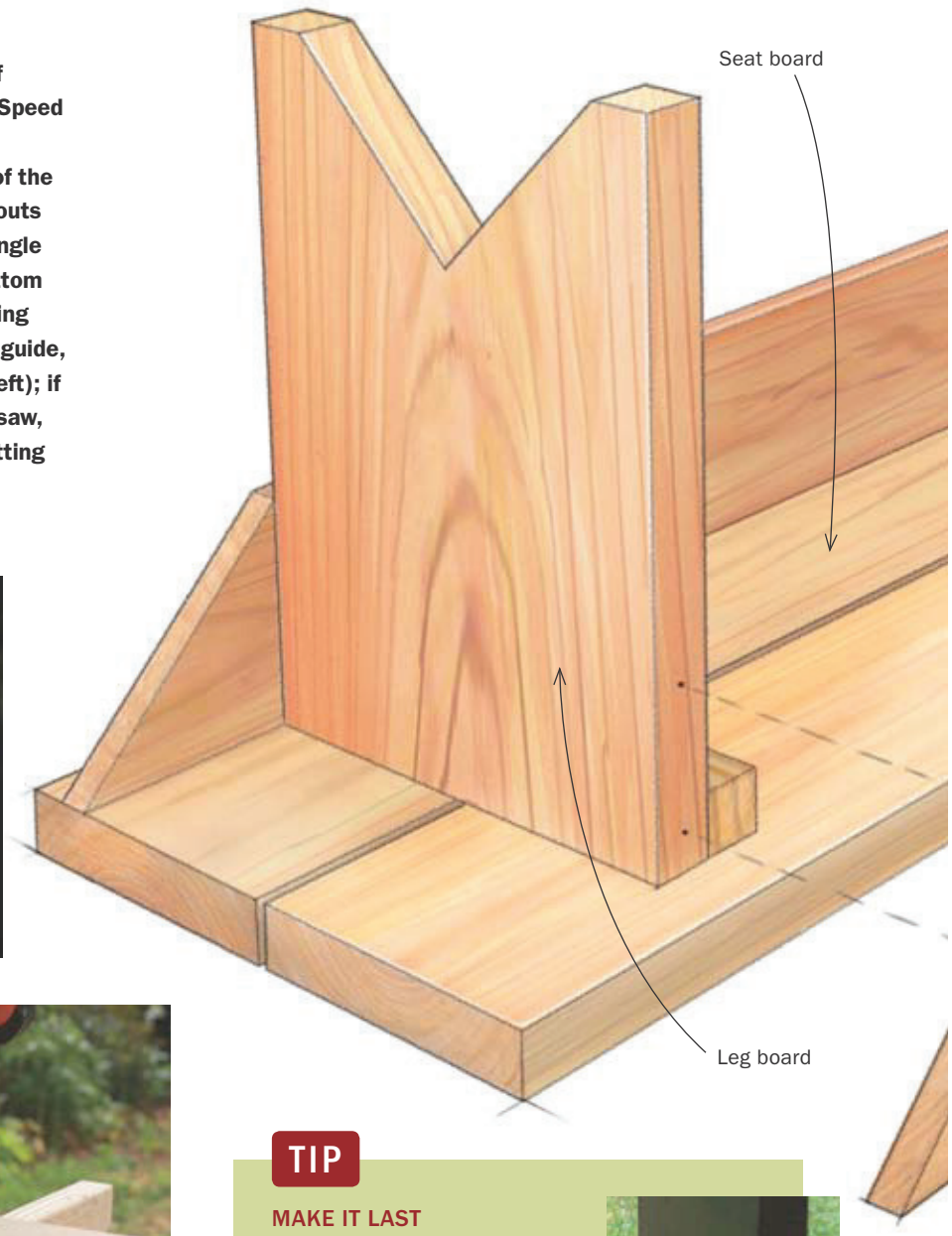
- Two 4-ft.-long 1x6s
- Two 16-in.-long 2x12s
- Two 11¼-in.-long 2x2s
- Two 4-ft.-long 2x8s
- Twelve 2½-in.-long stainless-steel decking screws
- Eight 1¾-in.-long stainless-steel decking screws

Assembling the bench

This project is simple enough that it makes sense to cut all of your boards first and then move on to assembly. You could make the cuts with a handsaw, but a circular saw is faster. If you have a jigsaw or bandsaw, all the better. After you cut the boards to length, follow these steps to complete the bench:

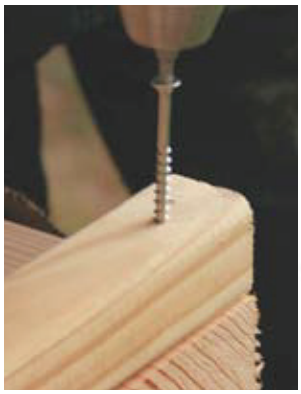
1. MAKE THE SPECIAL CUTS

For the tapered ends of the face boards, use a Speed Square to mark off 45° triangles on each end of the 1x6s. To make the cutouts in the legs, mark a triangle in the center of the bottom edge of each 2x12. Using the Speed Square as a guide, cut out the triangles (left); if you're using a circular saw, you'll need to finish cutting the leg notches with a handsaw.



2. ATTACH THE FASTENING BARS

On one side of each leg, position a fastening bar flush with the top of the board, and attach it with two 2½-in.-long screws, approximately 1½ in. from each end.



3. SPACE THE LEGS, AND ATTACH THE FACE BOARDS

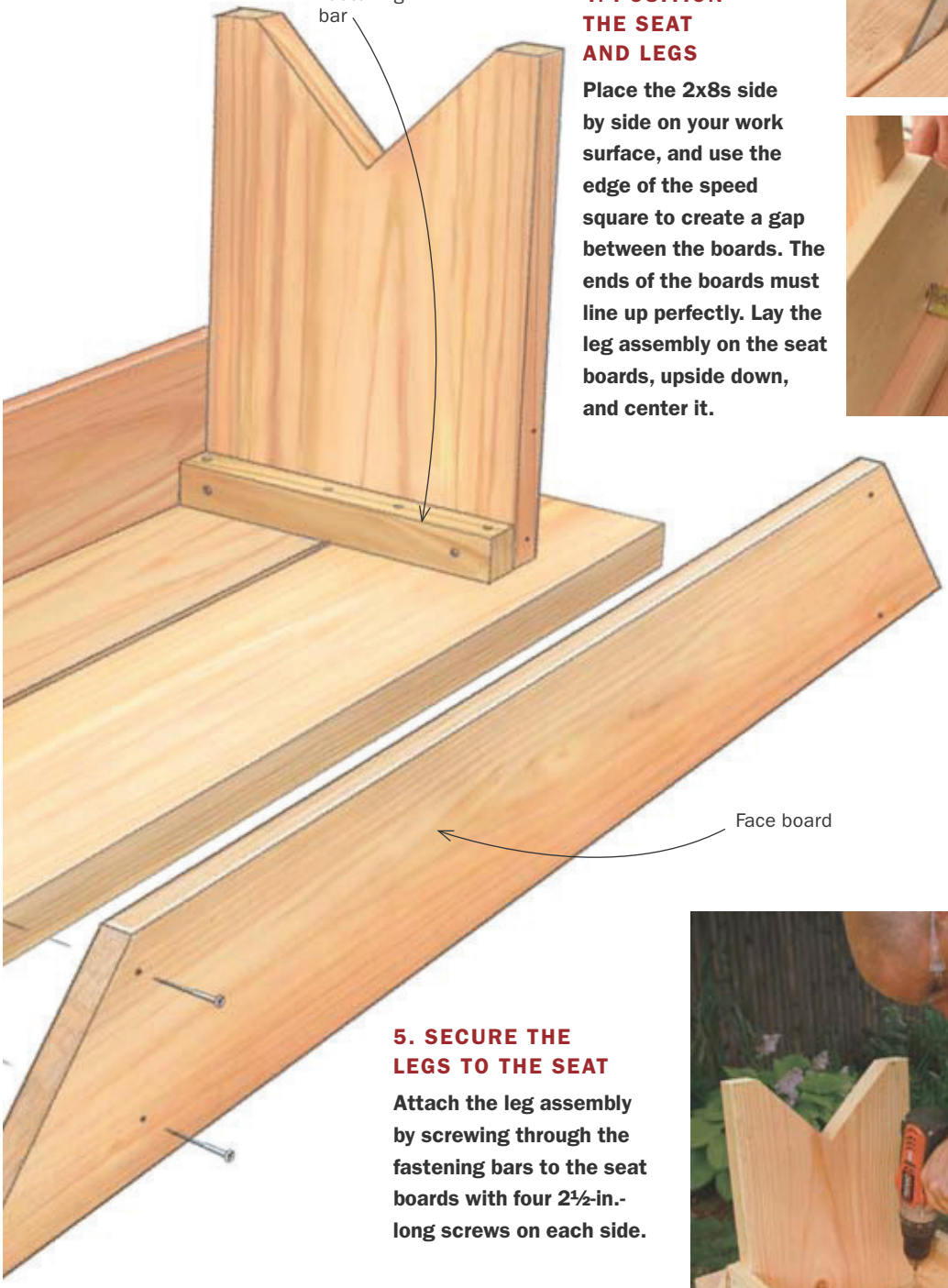
Rest both leg boards on their sides on a flat work surface, with the fastening bars facing each other. Place a face board on the side of the legs, and adjust the leg spacing so that the shorter edge of the face board is flush with the outside of each leg. Attach the face board to the legs with 1¾-in.-long screws. Flip the legs over, and attach the second face board in the same fashion.

TIP

MAKE IT LAST

You should get years of use out of this bench without much fuss. But like all wooden outdoor furniture, it won't last forever; the wood will eventually deteriorate. Wood's worst enemy is moisture, and the bench is most vulnerable where the legs come in contact with the moist ground. To make the bench last longer, simply place small pavers under the legs.

Photos: Michelle Gervais; drawings: Rob Wotzak



4. POSITION THE SEAT AND LEGS

Place the 2x8s side by side on your work surface, and use the edge of the speed square to create a gap between the boards. The ends of the boards must line up perfectly. Lay the leg assembly on the seat boards, upside down, and center it.

5. SECURE THE LEGS TO THE SEAT

Attach the leg assembly by screwing through the fastening bars to the seat boards with four 2½-in.-long screws on each side.

6. DRESS IT UP

I chose a semitransparent, weatherproofing, Bordeaux-colored stain to create a pop of color in my garden. Use any color you like, or let the bench weather naturally.

Ways to embellish your bench

You can personalize this bench in any number of ways. Here are some ideas:

PROVIDE A PLACE TO REST YOUR BEVERAGE

Using a hole saw, drill a large hole about 2 in. from each end of the bench. Use a circular saw or handsaw to widen the space between the boards at the end of the bench to meet the hole. I find this little feature handy when I relinquish my wine glass for my turn at boccie.

ATTACH A HIDDEN NOOK FOR TOOLS

Forgo one tapered end of the rear face board, and attach a short length of pipe under the end of the seat. Stow an extra pair of gardening gloves and an inexpensive set of pruners here for an occasional bit of spontaneous pruning.

ADD A BIT OF WHIMSY

Use a variety of hole saws to create a pattern of circles in the center of the face boards. This detail will give your bench a quick jolt of style.

Cedar Planters with an Optional Bench

Tall or short, with or without a seat, these boxes fit in almost any space

BY ASA CHRISTIANA

The key move when building wooden planters is to not ask them to hold dirt, which is full of water and bacteria and will ultimately win its battle with the wood. Instead, start with plastic planter containers, whether long boxes or big pots, make sure they have holes for drainage, and build wood boxes to hide them.

I started with big 16-in.-dia. pots from my local home center. The planter boxes are beyond simple: just roughsawn cedar fence boards screwed onto square posts hidden on the inside. I used pressure-treated wood for the posts. It's a bit cheaper than cedar, but it's also harder and holds screws more tightly.

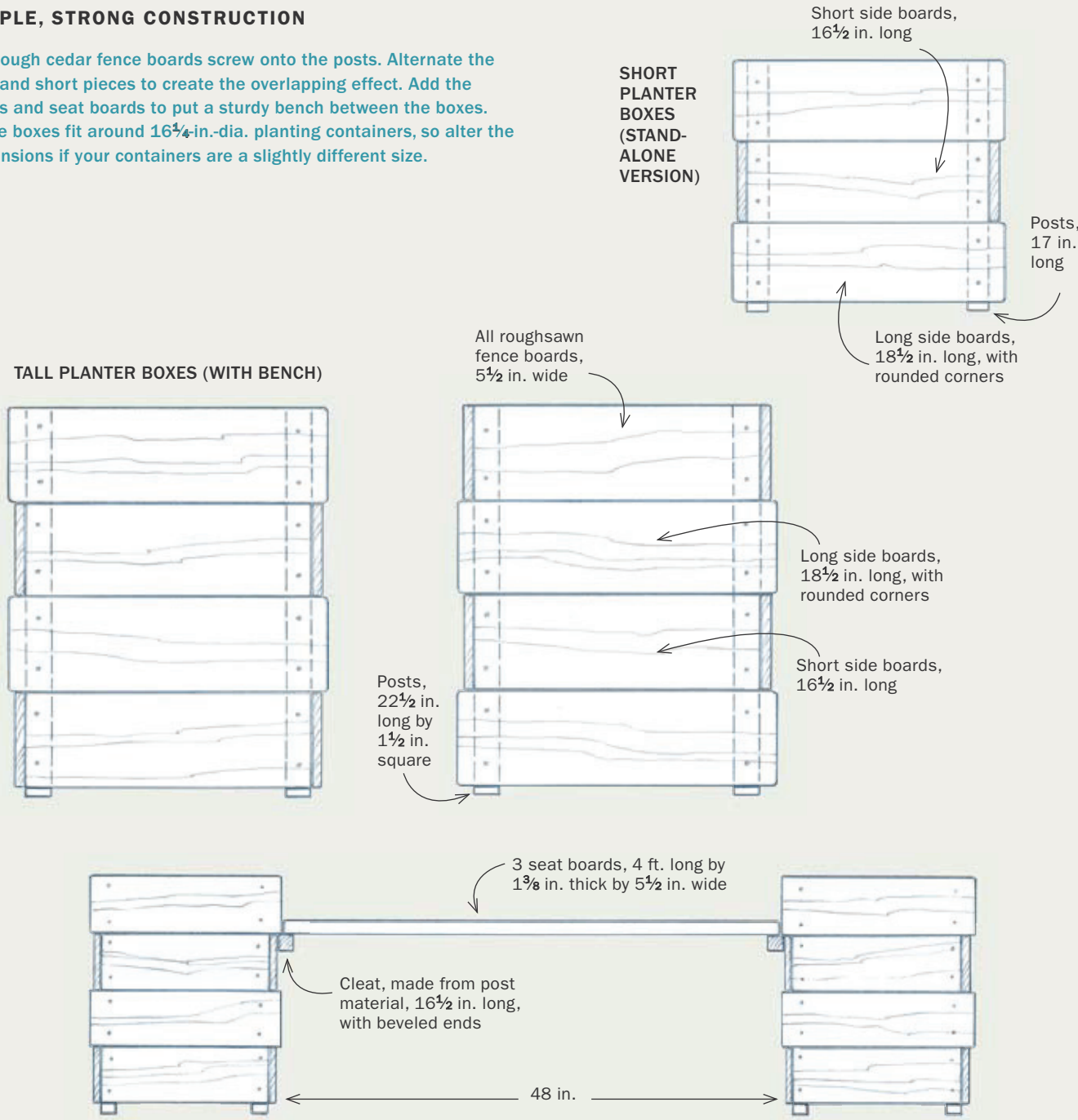
The roughsawn boards are nice, but most of the charm comes from an overlapping corner detail. To give the appearance of traditional joinery, I simply cut half of the boards a little long, rounded their corners, and overlapped them at the corners of the box.

Joinery is an old-timey word for the various ways wood can be cut so it interlocks and forms strong

Photos: Asa Christiana; drawings: Dan Thornton

SIMPLE, STRONG CONSTRUCTION

The rough cedar fence boards screw onto the posts. Alternate the long and short pieces to create the overlapping effect. Add the cleats and seat boards to put a sturdy bench between the boxes. These boxes fit around 16¼-in.-dia. planting containers, so alter the dimensions if your containers are a slightly different size.



joints. When you see dovetails on the outside of a box or drawer, or tenons emerging from their mortises (as they do on the outdoor bench), that's called exposed joinery, and it always turns heads. There's something about seeing the construction and craftsmanship that is pleasing to people. This overlapping detail is a nod to exposed joinery, but it's dead-easy to execute. Pretty and easy, my favorite combo.

If you want the full planter-and-bench array, make the planters full size, four boards tall, and screw on cleats to support the seat. That's the way I'll build the project in the photos that follow. To make the planters stand alone, I would make them shorter, three boards tall instead of four. They just look better that way on their own. But other than using shorter posts and fewer boards, the how-to is the same.

Asa Christiana is a freelance writer and editor in Portland, Ore. This is an excerpt from his book Build Stuff with Wood *(The Taunton Press, 2017).*

Assemble the sides

To assemble the planter box, start by making two opposite, identical sides. The short boards should end at the outside edges of the posts to set the overall width of the planter box, so attach those first as shown. Be sure to drill clearance and pilot holes to give the screws their best grip and avoid splitting the wood.

ATTACH THE SHORT BOARDS FIRST

Drill clearance and pilot holes. *If your drill bit isn't long enough for a full-depth hole, dimple the post, take the board away, and finish the job.*

Screw it down solidly. *Making sure the edges of the board are still aligned, drive 2-in.-long deck screws through the boards and into the posts.*

Attach the second short board. *Using one of the longer boards as a spacer, align the next short board with the outside of the posts, drill your clearance and pilot holes, and screw it down to lock the posts in the right position.*

LONG BOARDS NEXT

Even out the overhang. *The long boards go on the same way, but you must even out the overhang at each end. Use a combination square to make sure each end sticks out the same amount, roughly ⅜ in., and then drill the pilot holes and drive screws.*

Build the boxes

With two sides done, you can attach the rest of the boards and complete the box. Be sure to even out the overhang of the extralong boards and butt the ends of the short boards tightly against their neighbors when attaching them.

Weave in the other boards. *Flip over the two sides you already assembled so they are standing on their top ends. Notice how the feet stick out a bit. Then weave in the remaining boards to hold everything in place temporarily. Screw on the bottom board to hold the box together. Mark the hole locations, making sure they will clear the screws in the board on the adjacent side.*

Screw in the bottom board. *Predrill the pilot holes before putting the board back in place. With its ends tight, drive the screws.*

Work your way down. *Now you can attach the rest of the boards, one by one. On the long boards, mark clearance holes, drill them, and even out the overhang before drilling pilot holes.*

Complete the bench

Drill a few more holes, add the seat boards, and your planter/bench is ready for the patio.

One last hole. *This one is a clearance hole so you can drive a screw into the cleat from inside the box. Use 3-in.-long screws to attach the cleats, then drive shorter screws (1⅝ in. if you have them) from the inside to add strength. Be sure to drill pilot holes first.*

Cut and drill the seat boards. *After cutting the three boards to length (48 in. each), drill clearance holes for the screws that will attach them. Note the lines that show where to drill so the screws are centered on the cleats below. Space the planter boxes the right distance apart and drop in the seat boards.*

A few screws make them permanent. *Drill pilot holes down into the cleats. The small bit won't reach far enough, so remove the seat boards to finish the job. Then screw them down permanently with 3-in.-long screws.*

Plants need a boost. *The plastic pots were too short for these tall planter boxes, so Christiana gave them a boost with a few old paint cans. Then the plants dropped in at the right level. You don't need to do this with the shorter version of the planter boxes.*

Rustic Stick Table

Turn fresh-cut branches into a charming piece of backyard furniture

BY DOUG STOWE

This small table is the perfect place to put a plant, drink, or tray of snacks on your deck or porch. It's made from materials harvested straight from the forest, while a piece of ½-in. plywood provides the foundation for a richly textured random mosaic on top. The legs are 1½-in.-thick stock cut from a sapling.

Although this table is made of fresh-cut sycamore, other woods will work, too. Willow, for example, has straight, flexible branches that are easier to arrange in a more uniform pattern. You will notice that my pattern is not completely random. I liked the way the branches looked with an angle cut on the ends. I arranged them so that the ends formed a pattern around the perimeter of the top.

Build the base

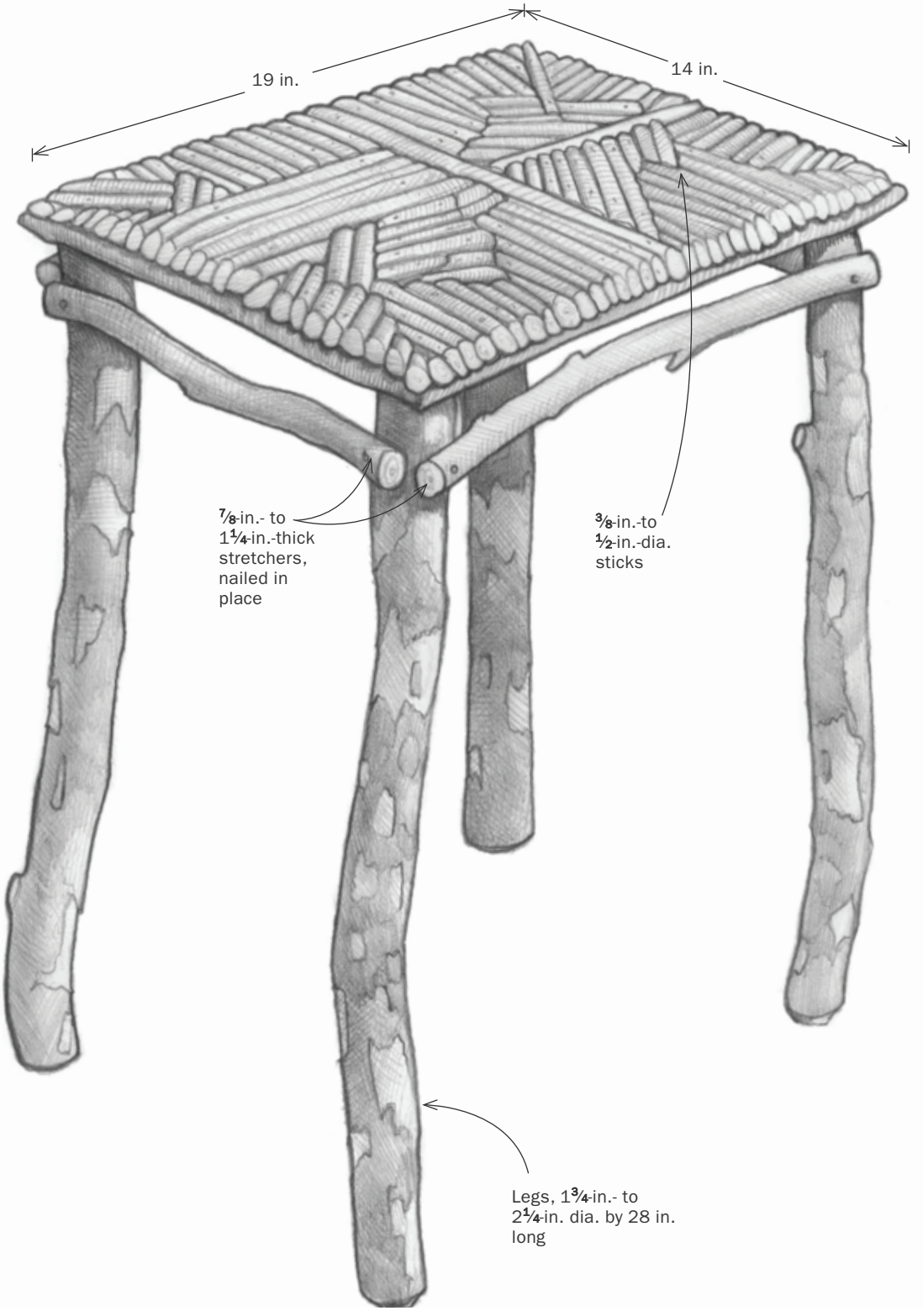
The base is simple. The top's plywood substrate is screwed into the tops of the legs. Each leg gets one screw. That by itself would make for a very rickety table. However, after you've finished making the mosaic top, you'll nail four stretchers to the legs (one on each side), giving the table enough strength for its intended use.

Start by cutting the plywood top to size. This can

Photos: Doug Stowe; drawings: Bob La Pointe

Square stick-and-branch table

This table is made from freshly harvested sycamore. The random mosaic pattern on the top is made of short sticks nailed to a plywood base. This simple construction technique can be used on tables of any size and shape. Use pruning shears to cut the sticks to fit. The stretchers strengthening the legs are added on the outside using an air nailer to secure them in place.



What you'll need

MATERIALS

BALTIC-BIRCH PLYWOOD

- One top (½ in. thick by 13 in. wide by 18 in. long)

SYCAMORE OR OTHER FRESH-CUT HARDWOOD (Rough cut 1 in. to 2 in. longer):

- 4 legs (1¾ in. to 2¼ in. dia. by 28 in. long)
- 2 aprons (⅞ in. to 1⅛ in. dia. by 17½ in. long)
- 2 aprons (⅞ in. to 1⅛ in. dia. by 13 in. long)
- 60 ft. small branches (⅜ in. to ½ in. dia.)

HARDWARE

- 4 screws (3-in. #8 porch and deck)
- 200 nails (1⅜-in. brad)
- 12 nails (2-in. brad)
- 4 furniture glides (⅞ in.)

Cut and attach the legs

Don't worry if the legs are a bit shaky at this point. You'll strengthen them and make the base more rigid when you add stretchers later.

Handsaw gets the job done. *Use a branch or a slender sapling for the legs.*

Screw the legs in place. *Clamp the top to sawhorses. The sawhorses also support the legs as you screw them in place.*

Paint the plywood top. *Spray paint works best. Use a piece of cardboard to shield the legs from overspray. Also, put masking tape around the tops of each leg for extra protection.*

be done on a tablesaw, with a handheld circular saw, or even with a handsaw. Regardless of the tool you use, make sure you cut it square.

Now use a handsaw to cut the legs to length. I cut the four legs for this table from a single sapling. The slight variation in thickness makes very little difference in the finished work.

After you have cut the legs to length, attach the tabletop with screws, one in each leg. Clamping the top to a sawhorse will help you to hold the legs tight while you drive the screws in place. I use 2½-in.-long exterior deck screws to secure the legs.

Paint the plywood top with black spray paint. The black paint will make the top nearly invisible if seen through the sticks. Use

Frame the top

Covering the plywood top's edge is a small detail, but it's necessary to complete the rustic look. Without it, the table would seem factory made.

Use pruning shears to cut the ends. *A final trimming cut following a rough cut will give a smoother surface.*

Nail the branches in place with an air gun. *Stowe uses 1¾6-in.-long nails and is careful to keep his fingers at least a nail's distance from the nailing point.*

TIP

WORK SMART

You will find that freshly cut "green" material will be much easier to work with than dry wood. When wood dries, the cell walls harden, making it harder to cut and harder to bend or nail.

masking tape and a piece of cardboard to protect the legs as you paint. You don't want any black paint on them.

Create the mosaic top

I use small branches to completely cover the plywood top and edges. On this table, it is OK if the top isn't perfectly smooth. I try to secure the pieces together tightly to minimize the space in between. If you don't have a nail gun, you can use a hammer, but you will need to drill pilot holes to avoid splitting. Fresh-cut wood will be easier to cut, more flexible to bend into shape, and less likely to split as it is nailed.

Carefully trim the branches to fit using pruning shears. If your branches are irregular in shape, you can make things easier by cutting them in short pieces laid end to end. Cover the edges with thin branches. I cut miters where the branches meet in the

Create the mosaic top

Start the pattern. *Begin creating a random mosaic by nailing down longer branches first. Carefully angle the nail gun so that the nails don't pass through the underside of the plywood.*

Fill it in. *Use shorter sticks between the longer ones, still angling the nails.*

Short pieces can be nailed through the end as you fill in the corners. *Make sure to angle the nailer inward so that the nails reach the plywood.*

TIP

WORK SMART

Two cuts are better than one. Cut branches just a bit long and then make a second cut. The second, removing just a small amount of material, will give a cleaner cut and a more refined and accurate look to the finished table.

corners and then use a nail gun to attach the branches in place. Pay close attention to the placement of your fingers to avoid accidents. They should be at least a nail's length from the tip of the gun at all times.

On the top, place branches in a random pattern, first dividing the top into sections, then filling the sections by adding one piece after another. I cut the ends at the angles required to fit tight to adjoining stock. Use the nail gun at an angle so the nails won't poke through the other side. Again, check where your fingers are with each shot to avoid accidents.

Gradually fill the space on the top, stick by stick. I arrange pieces so that I get a pattern of chamfered tips around the perimeter of the top. This gives a more uniform look to the edge, so it looks more consistent from a variety of angles, and I like the pattern it creates. Cut pieces to fill the corners, too. There is no exact pattern to follow. Just cut and fill until the entire top is covered.

Add stretchers to strengthen the legs

Pop, pop, and you're done. *Use two or more nails from various angles through each stretcher and into the legs. If you bring it indoors during ice and snow season, this table will give years of service.*

Even very short pieces can be used. Use the tip of the nail gun to hold them as you nail them in place.

Add stretchers to the legs

Strengthen the legs on the table by adding stretchers to the outside. These parts are required to make the table stable and strong. I use branches slightly thicker than the material for the mosaic pattern. Nails are sufficient to hold them securely in place. If you don't have a nail gun available, use screws so you can avoid hammering on the legs, as that could weaken the joints rather than make them strong. Choose your nail length by adding the thicknesses of the leg and the stretcher together. The nail should be just shorter than that length.

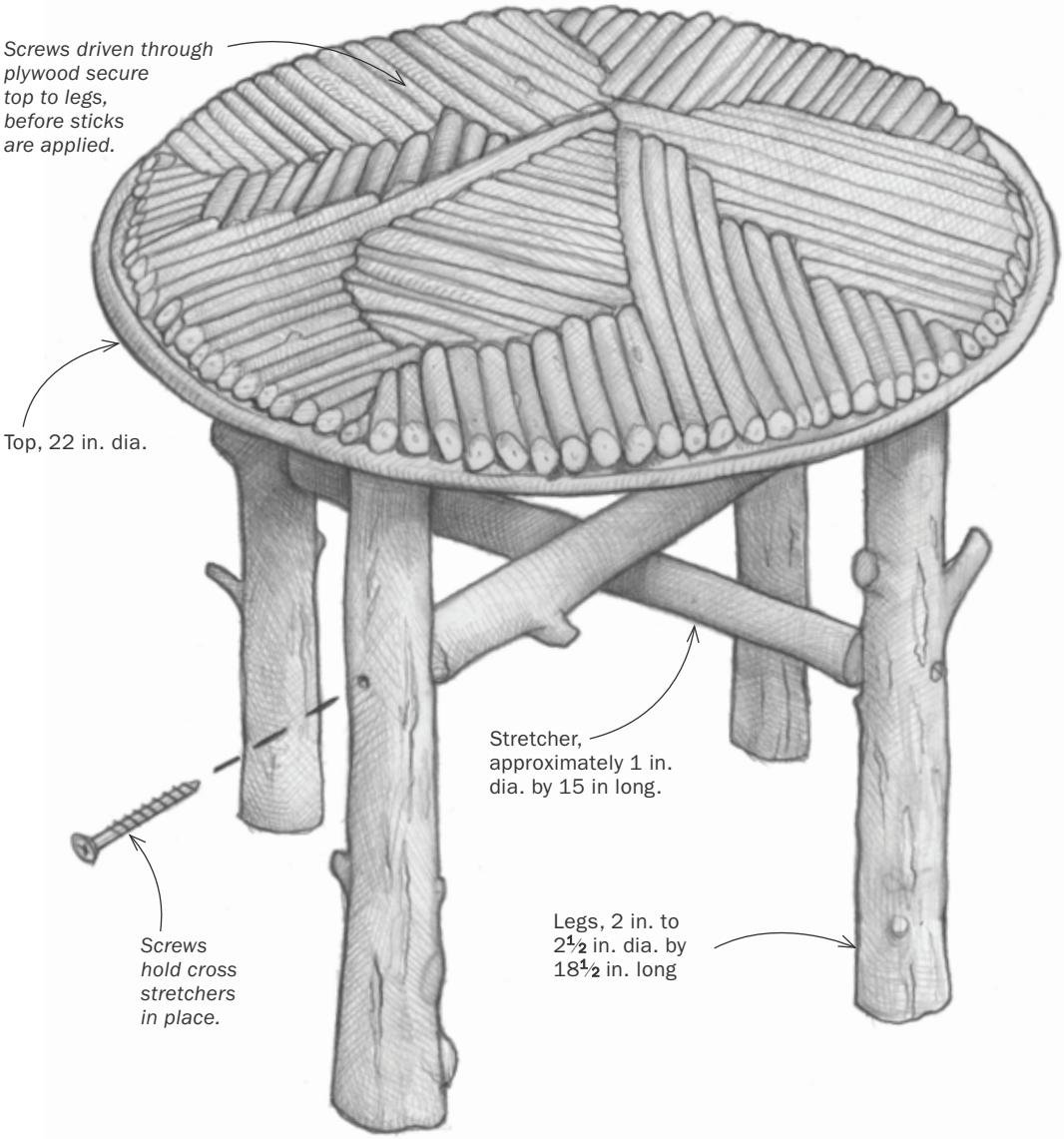
Cut the branches to a length equal to the width and depth of the table. I angle the cuts slightly so they don't stick out too far at the corners.

A round version

Round tables are a bit more appealing than square ones. This one is made with green walnut sticks and branches. Putting the branch edge on the round top requires that you use material that is fresh cut and flexible in order to bend it to shape without breaking.

Round stick-and-branch table

Overlapping stretchers beneath the top make for a very strong base, while freshly cut walnut can easily bend around the perimeter of the top.



What you'll need

MATERIALS

BALTIC-BIRCH PLYWOOD

- **One top (½ in. thick by 21 in. dia.)**

WALNUT OR OTHER FRESH-CUT HARDWOOD:

- **4 legs (2 in. to 2¼ in. dia. by 18½ in. long)**
- **2 stretchers (1 in. to 1⅛ in. dia. by about 15 in. long. Determine final length by measuring between legs.)**
- **90 ft. small branches (⅜ in. to ½ in. dia.)**

HARDWARE

- **8 screws (3 in. #8 porch and deck)**
- **1 screw (1¼ in. #6)**
- **300 nails (1³⁄₁₆-in. brad)**
- **4 furniture glides (⅞ in.)**

Predrill, countersink, and screw the legs to the cross-stretchers. *The ⅜-in. countersunk hole is just the right size for a dowel plug.*

Notch the second stretchers. *Use a knife to cut the notch. This small joint increases the base's strength.*

Screw the stretchers together. *Working from beneath the stretchers, drill and countersink a pilot hole where they intersect, then screw them together.*

Use the nail gun to attach the stretchers to the legs. I use two or more nails to attach each end and angle each nail differently to provide additional resistance to pulling out.

The round table has crossing stretchers

The techniques for making the round version of this table are the same as those used for the square table, with one exception: the stretchers. On the round table, the stretchers are not nailed to the outside of the legs. Instead, they cross over one another between the legs.

To make the stretchers, first measure the distance between opposite legs and cut the branches to that length. Use countersunk wood screws to hold the first stretcher in place, screwing from the outside of the leg into the stretcher's end.

Before installing the second cross-stretcher, carve a small notch where the two intersect. This will allow the cross-stretchers to be screwed securely to each other.

After screwing the second stretcher to the legs, screw the stretchers together from underneath. Drill a pilot hole and select the length of the screw so that it won't go all the way through both pieces of stock. This way, the screw won't be visible. □

Doug Stowe is a furniture maker in Eureka Springs, Ark., and has written numerous articles and books on woodworking. This article is adapted from his book Rustic Furniture Basics *(2009, The Taunton Press).*

Finish the top. *Arrange sticks in a pattern and nail them in place on the top.*

OUTDOOR FURNITURE

Wooden Doormat

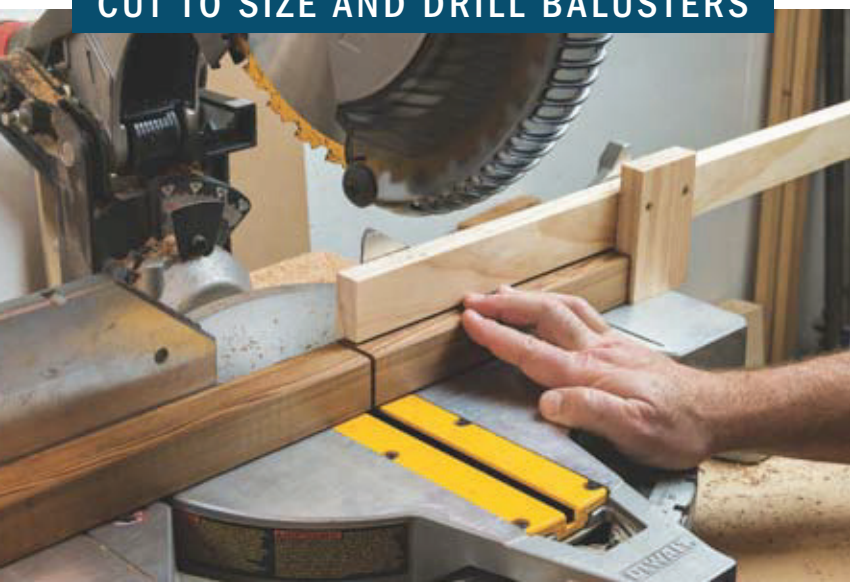
Make a pretty and functional project with only a few tools

BY ASA CHRISTIANA

SIMPLE SUPPLIES

You'll need 10 cedar balusters (sold as 2x2s but actually 1½ in. square and each 36 in. long), 15 ft. of ⅜-in.-dia. sisal rope, and a 7/16-in. sized drill bit. You'll need to cut 30 pieces 9¾ in. long and 12 pieces 3 in. long.

CUT TO SIZE AND DRILL BALUSTERS



Miter saw speeds things up. *Christiana attached a stop to his miter saw that let him cut a pile of matching pieces without measuring. You should be able to get three long pieces and two short ones from each baluster.*

Mark for drilling. *The holes in the short pieces go in the center, and the ones in the long pieces go 1½ in. from the ends. All of them are centered on the thickness of these 1½-in.-sq. pieces. To drill accurately, dimple the wood right at your crisscross marks using a big nail. Drill the holes straight. A sacrificial piece of wood below will help to prevent chipout at the exit hole. You can also use a drill press that guarantees a straight hole and lets you set up a fence and stop to position every part perfectly.*

Photos: Asa Christiana

When you search the maker movement online, Brad Rodriguez's popular website pops up early and often. Launched in 2015, Fix This Build That (fixthisbuildthat.com) has nearly 100,000 monthly visitors, with an Instagram following of more than a half million at last count.

The projects are designed to be stylish yet doable, and Brad isn't afraid to mix in other materials like concrete, LEDs, and anything else you might find online or at the home center.

I couldn't make it to Tennessee to shoot Brad in action, so we collaborated from afar. I picked out this doormat and built it in my own shop, with Brad's guidance.

It turns out that this project is one of the most popular on the Fix This Build That website, and it's not hard to see why. The doormat couldn't be prettier or more functional.

Simple tools and materials

I followed Brad's instructions as I built several of his projects, but added a few of my own twists. In this case, I changed the wood. The doormat requires only a small pile of deck balusters, the long square pieces that go vertically under railings to create a fence of sorts. But instead of the pressure-treated wood Brad used, I went with cedar. Both will stand up to weather and water beautifully, but the pressure-treated wood required a stain to look its best, while the cedar didn't. On the other hand, cedar is softer and will wear quicker, so you choose. In either case, take your time and pick straight pieces, with as few knots as possible.

I tried to mix things up by trading Brad's sisal rope for some sort of synthetic rope like climbers use (the home center has a long row of choices), but Brad's choice was clearly the best looking.

As for tools, you will need nothing more than a handsaw and a drill of some kind. I used those, but you can also speed things up with a miter saw and drill press, if you or a friend own those tools. □

Asa Christiana is a freelance writer in Portland, Ore. This is an excerpt from his book, Handmade: A Hands-on Guide *(The Taunton Press, 2018), a compilation of DIY projects and profiles of their makers.*

Start threading. *Wrap tape tightly around the leading end of the rope and work from one end of the doormat to the other, using one continuous piece. Start at the back of the mat, threading the rope through a short piece and work your way toward the front of the mat, alternating long and short pieces.*

Keep on threading and tighten the rope. *Tie a knot at the back end and work your way forward to the long piece at the front. Tighten the rope starting at the first end of the mat pulling the rope as hard as you can to pull the pieces together. Work your way across the mat, pulling the loop front and back, and then tie a tight knot at the far end. Cut off the excess rope and you're done.*

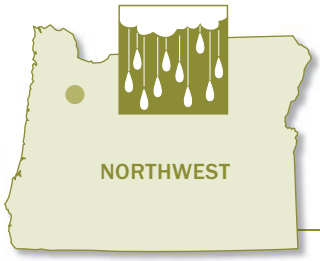
Finishes for outdoor life

IF YOU ARE DEAD-SET ON PREVENTING GRAY, HERE ARE THE OPTIONS

BY TOM BEGNAL

How we tested

We treated five wood species with five outdoor finishes. To find out how the samples would hold up over the course of the year to the weather in different regions of the country, we sent a rack of sample boards to Oregon, New Mexico, and Louisiana, while one stayed in Connecticut. Each region subjected the samples to a unique set of climate conditions. The data represent average numbers.



Salem, Ore.

Lots of cool temperatures and high humidity. On average, only one day in five is sunny.

Seasonal temperatures (°F) (high/low)
Winter: 48/34
Summer: 79/50

Relative humidity (AM/PM)
Winter: 74%/87%
Summer: 43%/85%

Sunny days: 77

Rainfall: 39 in.

Snowfall: 7 in.

Bridgeport, Conn.

In winter, freezing and thawing cycles aren't kind to wood.

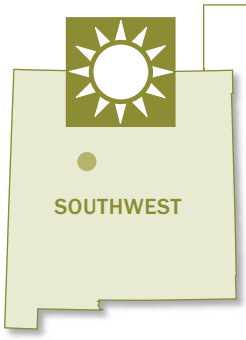
Seasonal temperatures (°F) (high/low)
Winter: 38/24
Summer: 80/63

Relative humidity (AM/PM):
Winter: 58%/71%
Summer: 61%/78%

Sunny days: 99

Rainfall: 42 in.

Snowfall: 26 in.



Albuquerque, N.M.

Plenty of sunshine, not much rain, and low humidity make for a wood-friendly environment.

Seasonal temperatures (°F) (high/low)
Winter: 49/24
Summer: 91/62

Relative humidity (AM/PM)
Winter: 38%/67%
Summer: 25%/57%

Sunny days: 167

Rainfall: 9 in.

Snowfall: 10 in.

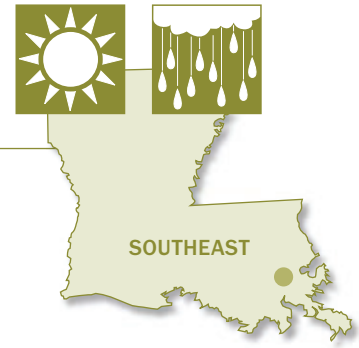
Seasonal temperatures (°F) (high/low)
Winter: 63/44
Summer: 90/72

Relative humidity (AM/PM)
Winter: 66%/85%
Summer: 65%/91%

Sunny days: 101

Rainfall: 62 in.

Snowfall: ¼ in.



New Orleans, La.

Hot and humid summers. Plenty of rain. Freezing and thawing cycles are as rare in Louisiana as snowy owls.

The great outdoors isn't great for wood. No matter if it's a fallen maple tree in the back woods or an Adirondack chair in the backyard, nature wants to convert all dead wood into compost.

Sunlight and moisture do a lot to start the process. Sunlight, particularly the ultraviolet (UV) wavelength, causes a chemical degradation in wood. Moisture absorbed by the wood fibers causes them to expand and contract, producing surface checks. Also, the freezing and thawing cycles common in northern climates can exacerbate the weathering process. Left unfinished, a new piece of furniture will start to look weathered in a few weeks. In a year, it can look ancient.

If you choose the right woods and don't mind that slightly shaggy silver look, you can forgo a finish. But if you want to keep a piece looking pristine, a protective finish is a must. And if you want to see and enjoy the wood, you'll want a clear finish.

WATCO EXTERIOR WOOD FINISH

Source: rustoleum.com

Price: $14/qt.

Application: Two coats, each applied liberally

Results: The outdoor penetrating oil finish was the easiest to apply, but at the end of the yearlong test, all the samples, except for those in New Mexico, had weathered to various shades of gray. All the samples had rough surfaces. Shallow cracks and checks were common. Some pine samples had full-thickness checks on the end.

Rating: Unacceptable

There are several types made for outdoor use. But, as we discovered in a yearlong test, they don't all deliver. Some offered almost no long-term protection. Others did much better. But our test did more than help us find good outdoor finishes. It also showed us how different wood species hold up to the weather. And it gave us new insight into the effect of climate on both finish and wood.

Testing tells the tale

The test evaluated the four types of finish used most often outdoors: penetrating oil, water-based polyurethane, marine spar varnish, and marine extra-UV-filter varnish, plus a combo touted by a finishing expert, epoxy and marine extra-UV-filter varnish. Also, to see if the wood species made a difference, we applied each finish to five different woods: cedar, ipé, mahogany, pine, and white oak. All, except for pine, are known to hold up to the outdoors better than most. Finally, to see how geography factors in, we ran the test in four regions of the United States with distinctly different climates: the Northeast (Connecticut), Northwest (Oregon), Southwest (New Mexico), and Southeast (Louisiana).

Each wood sample was ¾ in. thick by 6 in. wide by 8 in. long. For consistency, all the samples of each wood came from the same board. And every coat of finish was applied equally to both sides and all edges. Each finish was applied according to the manufacturer's recommendations shown on the label.

We built four test racks, each designed to hold 25 samples. One rack went up on the flat roof of our Connecticut office building (a perfect out-of-the-way

ZAR EXTERIOR WATER-BASED POLYURETHANE

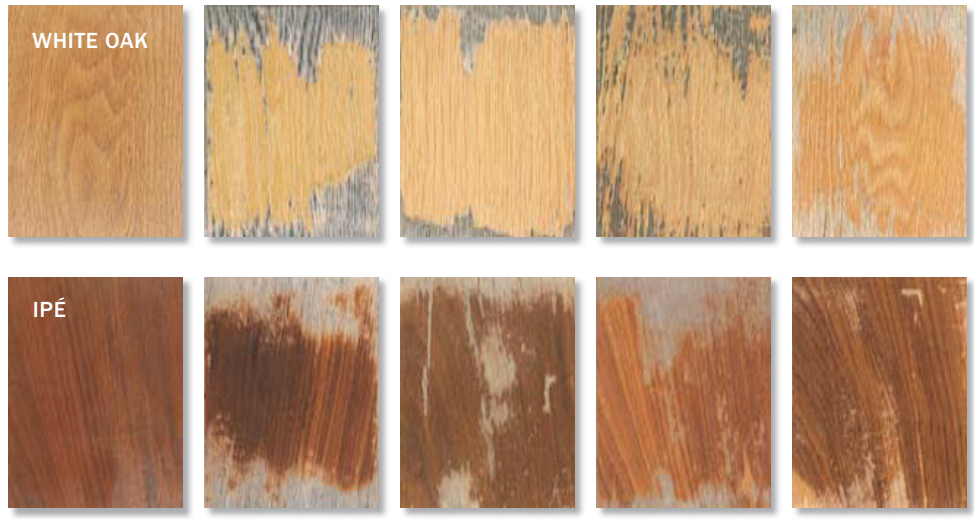
Source: zar.com

Price: $28/qt.

Application: Three coats

Results: On average, about 20% of the finish had deteriorated, resulting in areas of weathered gray. Where the finish remained, much of it showed areas of flaking and chipping. The mix of grayed wood and remaining finish produced an unsightly mottled look.

Rating: Unacceptable



Photos: staff; drawings: John Tetreault

McCLOSKEY MAN O'WAR MARINE SPAR VARNISH

Source: mccloskey finishes.com

Price: $40/qt.

Application: Four coats

Results: The finish generally held up well on the mahogany, ipé, and pine. Same with the cedar samples, except for the one that visited New Mexico—that one showed some finish deterioration. The white oak samples had the toughest time, with about 40% of the finish deteriorating.

Rating: Fair to good

location, we thought, until summer arrived and a colony of hornets built a nest at the trapdoor leading to the roof); the other three went to our regional testers. All the racks were positioned to face south, ensuring maximum exposure to the sun, with the samples tilted at 45° to prevent standing water.

What we learned

After 12 months, all the samples came home to our shop. The results are shown on these pages. For space reasons, we only included photos of the white oak (a light-colored, open-grained wood) and ipé (a dark-colored, close-grained wood).

One thing was immediately obvious: The samples finished with oil suffered the most. All five wood species in all four regions had roughened surfaces. With the exception of those from New Mexico, all the bright surface colors had been replaced by various shades of gray. Also, all the samples showed end-grain checks and surface cracks, most of them minor. The pine samples, however, showed several end-grain checks that extended the full thickness of the wood.

In fact, the oiled wood didn't look any better than unfinished wood exposed to the same conditions. So unless you want to reapply the oil every couple of months, don't bother with it.

Although faring better than penetrating oil, both the exterior water-based polyurethane and the spar varnish were disappointments. All the water-based poly samples showed deterioration, some minor but most closer to major. Spar varnish held up slightly better, with a 50/50 split between major and minor levels of deterioration. The spar-varnish pine

EPIFANES HIGH GLOSS MARINE VARNISH

Source: epifanes.com

Price: $45/qt.

Application: Seven coats, thinned per instructions

Results: No sign of finish deterioration, no sign of flaking or chipping. Samples showed only the slightest change in color. Mind you, it takes a while to apply the seven required coats.

Rating: Very good

Source:
smithandcompany.org

Price: $42/qt. plus $45/qt.

Application: Three coats epoxy plus five coats Epifanes (unthinned)

Results: No sign of finish deterioration, no sign of flaking or chipping. Only the slightest change in color.

Rating: Very good

SMITH & CO. PENETRATING EPOXY SEALER UNDER EPIFANES MARINE VARNISH

sample from New Mexico was an exception, as it held up pretty well.

Without question, the marine extra-UV-filter varnish and the epoxy plus marine varnish looked the best. The colors maintained much of their brightness. Surface cracks, checks, or defects were almost nonexistent. The only reason I rated them "very good" rather than "excellent" was because the colors changed slightly during the yearlong test: The ipé lightened. The white oak lightened, but only a bit. The cedar and pine darkened. The mahogany darkened, except in New Mexico, where it lightened slightly.

Interestingly, the samples from New Mexico suffered the least. Oregon samples did better than those from Connecticut and Louisiana. The Connecticut samples looked the worst. So, our test showed moisture causes more weathering than UV light. Combine it with freezing and thawing cycles, as is common in north, and the wood weathers even more.

As far as wood species go, the cedar and ipé samples held up a bit better than the others. Mahogany and white oak showed slightly more weathering. The pine boards had the toughest time.

Choosing a favorite

The Epifanes finish and epoxy-plus-Epifanes held up equally and the work to apply them was about the same. Forced to pick a favorite, I'd take the Epifanes, because it is one product, not two. □

Tom Begnal is a woodworker in Kent, Conn., and a former associate editor at Fine Woodworking.

Which finish is right for you?

A PROTECTIVE FILM FINISH

Keep wood looking new. *After about a year outdoors, this project finished with Epifanes looks almost as good as it did after its first day.*

THE WEATHERED LOOK

No finish at all. *If you like the rustic look of weathered wood, don't bother to add a finish. Oil finish (Watco) didn't have a visible effect after a year. But ipé, cedar, and mahogany weathered the best, in that order.*

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