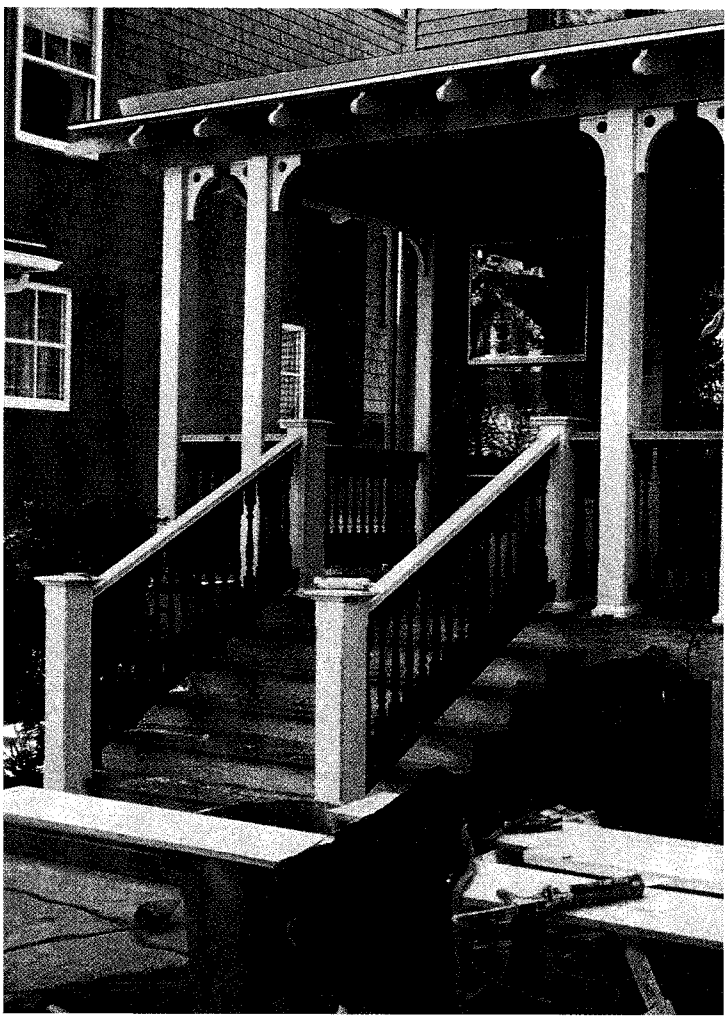
Porches That Won't Rot

■ BY KEVIN M. MAHONEY

Even as a boy, I'd happily go out of my way to look at a good porch. I'd ride my bike down the streets of old neighborhoods in Buffalo, New York, and imagine myself living in the houses I passed. My favorites were the houses with distinctive front porches. Massive and ornate or simple and elegant, the porch made the house.

I'm not surprised that I now work as a carpenter for a company specializing in building and restoring Victorian front porches. During the summer, we spend more than half our time either building new porches or fixing old ones. I think Garrison Keillor got it right when he described a good porch as a place that "lets you smoke, talk loud, eat with your fingers . . . without running away from home."

Because these open-air structures add so much to a house, I'd like the ones I build to last forever. That isn't literally possible. But we have developed a system for wood-porch construction that makes great strides toward that end. As we worked on older porches, it became obvious that what hurt them most was trapped moisture and lack of air circulation. That's what destroys columns, floors, and framing. Some builders of an earlier era avoided these problems by using hollow



At this Buffalo, New York, Victorian house, the front porch was rebuilt using techniques designed to eliminate trapped moisture that leads to rot.

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posts and beams and by finding other ways to circulate air through the structure. We combine some of these time-honored techniques with a few of our own, and we add the protection that modern paints and sealants can offer. Our oldest projects, going back 11 years, still show no sign of decay, so we think we're on the right track.

Failure in the Usual Places

We rebuilt a porch for Robert and Denise Sheig in Buffalo. Their house is a beautiful turn-of-the-last-century Victorian that sits on a tree-lined street in the city's Delaware Park district. Parts of the original porch have held up for nearly 100 years; parts that failed were typical trouble spots. The wooden stairs and railings had long since deteriorated and had been replaced in the 1940s by concrete stairs and iron railings. The flooring below the columns and the bottoms of the columns themselves had rotted, as well as the spindle ends in the porch railing. The porch skirting had decayed where it pressed against the ground. And the porch beam and the exposed rafter tails had decayed where either the roof or the gutter built into the roof (called a Yankee gutter) had leaked.

Our first task was to rebuild the supporting posts and beams and the deck framing. After bracing the main roof beam from the ground, we removed old columns, railings, concrete stairs, and decking. About 50% of the existing floor framing could be salvaged; the rest had rotted beyond repair.

The floor joists rested on three 6x10 beams, 8 ft. on center (o.c.), running perpendicular to the house. The 6x10 beams, which slope ¼ in. per ft. so that water drains away from the house, were supported by rusting metal posts. After bracing the beams, we removed the metal posts; then we dug three 48-in. deep holes and poured in about 8 in. of concrete for footings. After the concrete had set, we added 3 in. of gravel for drainage, coated the new 6x6 pressure-treated posts with Benjamin Moore Moorwood Penetrati Clearwood Sealer, and set the posts on top the gravel in the holes. We topped off each hole with concrete and brought in some fil to pitch the grade under the porch away from the house.

The 2x10 floor joists, set 16 in. o.c., sit top of the beams and are parallel to the house. We replaced the rotted joists with pressure-treated lumber. Normally, a 2x rir joist would be nailed to the ends of the joists to strengthen and stabilize the frame But eliminating extra layers of wood reduc the chance of decay, so instead we used a 1x12 pine apron to cap the joist ends. The 1x12 serves the same purpose as a rim joist and also becomes the top rail of the skirtin that we built later. This eliminated a layer wood that might later hold moisture and lead to rot.

Along the front of the porch, the 1x10 pine apron had to be nailed to the face of the last joist. That couldn't be avoided, but we used ¼-in. thick furring run vertically 12 in. o.c. to separate the apron from its neighboring joist. We use this technique wherever possible: When two boards must be face-nailed, we separate the two with blocks or furring to encourage air circulatio

Deck Must Shed Wate

Once the deck framing was complete, we a lowed it to set for about 3 weeks before installing the deck boards. Pressure-treated lumber shrinks during this period, and dec can buckle if they are installed on new fra ing too soon. The 5/4 T&G flooring, 3 in. wide, runs perpendicular to the house so that water won't become trapped between boards as it runs off the deck. We painted the tongues and grooves with Benjamin Moore Alkyd Urethane Reinforced Porch and Floor Enamel and installed the deckin while the paint was still wet. Painting the tongues and grooves is essential, but there no reason to lose time waiting for those parts to dry. The paint provides a good bo between boards. We also coat the tops of a

TIP

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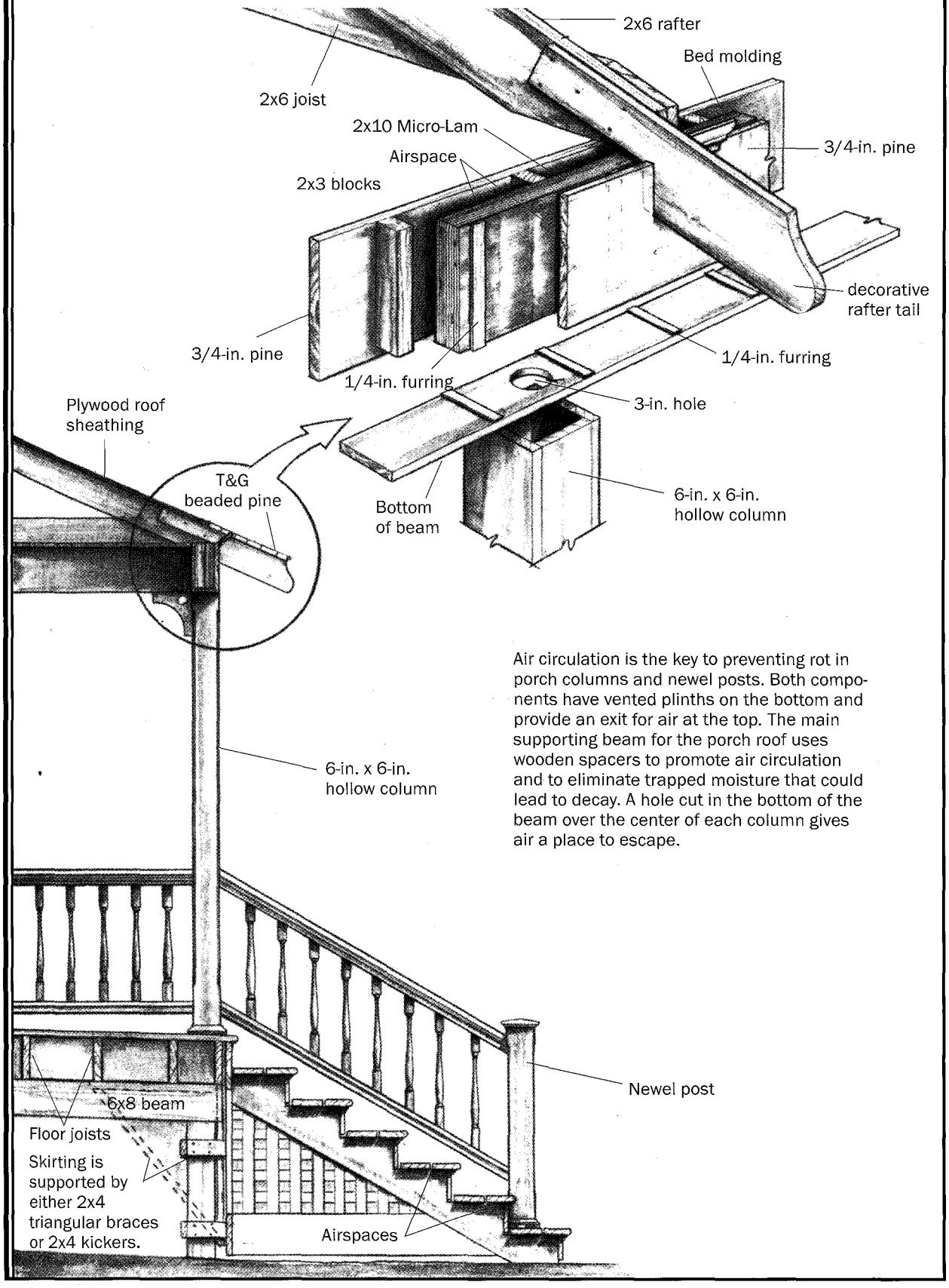
Elements of a Rot-Resistant Porch



Air circulation is the key to preventing rot in porch columns and newel posts. Both components have vented plinths on the bottom and provide an exit for air at the top. The main supporting beam for the porch roof uses wooden spacers to promote air circulation and to eliminate trapped moisture that could lead to decay. A hole cut in the bottom of the beam over the center of each column gives air a place to escape.

The trick to keeping air moving through both the columns and the newel posts is wooden plinths we make ourselves.

floor joists with a penetrating sealer before the deck boards are installed.

Each deck board was blind-nailed at every joist with galvanized 8d ring-shank nails. We ran the decking long and then cut it off after installation, leaving an overhang of 1½ in. beyond the aprons. We rounded the edges with a router, sanded the deck, and finished it with three coats of the porch and floor enamel. We use oil-based enamel because it seems to dry harder and last longer than latex enamels, and it also has a high gloss we just can't get from latex paints.

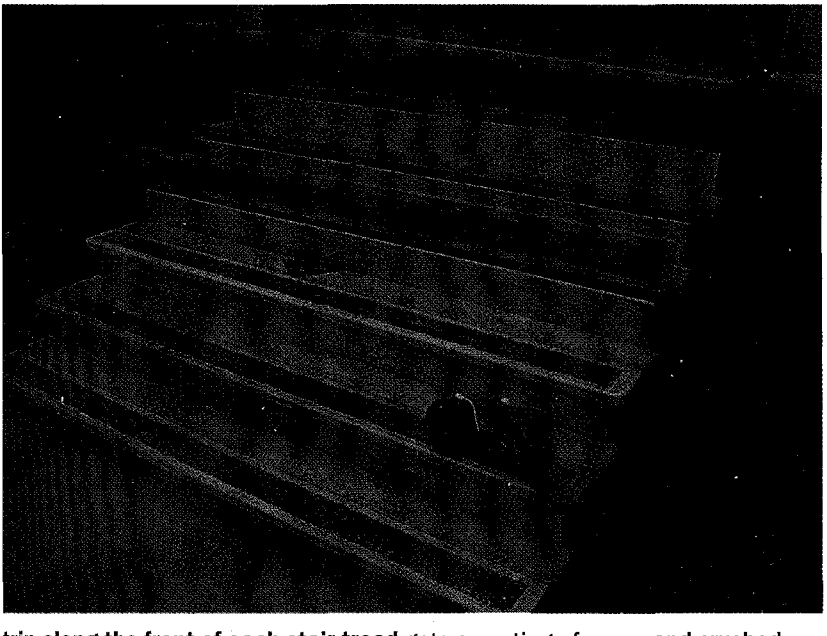
Adding New Skirt Sections

The new skirting, which covers the gap between the porch deck and the ground, consists of frames made from ¾-in. lumber and either solid or lattice panels. Our skirts were designed to use minimal materials and allow maximum ventilation. And they maintain the original character of the Sheigs' porch. The top rail is the pine apron, 1x10 on the front and 1x12 on the sides (the side pieces are wider so that the top edges can be tapered to follow the pitch of the deck). These pieces were fastened to the deck framing with 2-in. narrow-crown galvanized staples. The stiles are 1x8 pine, and the bottom rail is 1x8 pressure-treated yellow pine. The stiles and the rails are joined with biscuits, and the joints are backed with wood blocks glued with construction adhesive and stapled from behind. The support framing for the skirting was kept to a minimum to avoid a foothold for decay. We used either horizontal 2x4 kickers attached to the posts or triangular braces made from 2x4s.

The skirting on the original deck was a mix of lattice and solid panels, and we matched what was there. The solid panels are ¼-in. lauan mahogany plywood with two coats of WEST System® marine epoxy from Gougeon® Brothers, Inc. The marine epoxy doesn't raise the grain on the thin plywood panels and gives them added protection from the elements. The panels were coated on both sides and on the edges. We mounted them on the inside of the framework with ¾-in. galvanized staples; an ogee panel molding finishes the perimeter. The lattice panels were built in place using ½-in. by 2¾-in. pine strips, which we ran vertically and horizontally.

TIP

To provide sure footing, epoxy a strip of crushed walnut chips—size 10–12—on the front of each step.



trip along the front of each stair tread gets a coating of epoxy and crushed nut shells for good footing in poor weather. The furring at the top of the stairs separate the top riser from the board beneath it and prevent trapped water t could rot the structure.

Building the Stairs

We cut our stringers from 2x12 pressure-treated yellow pine, which we buy in bulk and season for about a year before using. We set the stringers 16 in. o.c. and attached the top ends directly to the outermost floor joist. To stabilize the stringers and to prevent twist, we installed 2x4 blocks between the tops of the stringers but held the blocks away from the face of the joist with ¼-in. furring (photo, left). The bottoms of the stringers were set on a concrete pad pitched to carry water away from the porch. Once installed, the stringers were coated with two coats of the same preservative we used on the support posts.

We used clear pine for both risers and treads because pressure-treated lumber is more susceptible to cracking and warping than clear pine is and because it doesn't have the same finished look as clear pine when painted. But we made the first riser from pressure-treated lumber because it rests directly on the ground. Risers are made from ¾-in. stock that is ripped so that the top edge supports the front edge of the next tread. We leave a ⅜-in. space between the bottom edge of the riser and the stringer to eliminate a water trap. The treads are made from 5/4 stock, two for each step. We also leave a 3/16-in. gap between the two treads and between the risers and the adjoining treads so that water will drain easily. To provide sure footing, we epoxied a strip of crushed walnut chips on the front of each step. The chips are manufactured by Buffalo Sand Blasting Sands Company, Inc. We use size 10-12 chips and find they work better than anything else we've tried.

Rules of Thumb

Our approach to porch construction can be boiled down to a handful of general rules that will help any wooden structure survive outdoors.

- Use pressure-treated lumber for deck and stair framing and for all components that come into contact with the ground.
- Encourage airflow beneath the porch and the stairs.
- Pitch the floor away from the house to allow water runoff.
- Seal all end grain.
- Vent columns and newel posts at both top and bottom.
- Avoid unnecessary wood-to-wood contact that can trap moisture.

A New Main Beam and Roof

We had hoped to save most of the original hip-roof framing and the supporting beam. But we ran into more rot than we had expected—a typical renovation dilemma. We stripped five layers of leaky roofing and removed the 1x8 plank sheathing, which had rotted in spots, and badly at the edges. The decorative rafter tails had deteriorated and so had the decorative T&G beaded-pine sheathing used on the overhanging portion of the roof. The front section of the beam had taken water from above, and because it was made up of sandwiched 2x8s and wrapped tightly in ¾-in. pine, the beam had trapped the water and rotted.

To get the strength we needed and still have a relatively hollow front beam, we used a 2x10 Micro-Lam (a laminated plywood beam), which ran the entire length of the porch. To build it out to the necessary finished dimensions, we glued and screwed 2x3 blocks to one side of the Micro-Lam and then glued ¼-in. vertical furring to the other side. We also furred the bottom of the beam with ¼-in. material, and then wrapped the sides and the bottom in ¾-in. pine to match the existing side beams.

We drilled a 3-in.-dia. hole in the bottom of the beam where it would rest on each of the 10 columns. The holes would allow air circulation between the hollow columns and the beam and roof framing. We cut new rafter tails from clear pine, sealed them with two coats of WEST System epoxy and installed them. New 3-in. T&G beaded pine was run on the top of the rafter tails where it could be seen from below. From this point up, where the sheathing would be hidden by the porch ceiling, we used ¾-in. CDX exterior plywood. We used 30-lb. felt and asphalt self-sealing three-tab shingles to finish the roof.

TIP

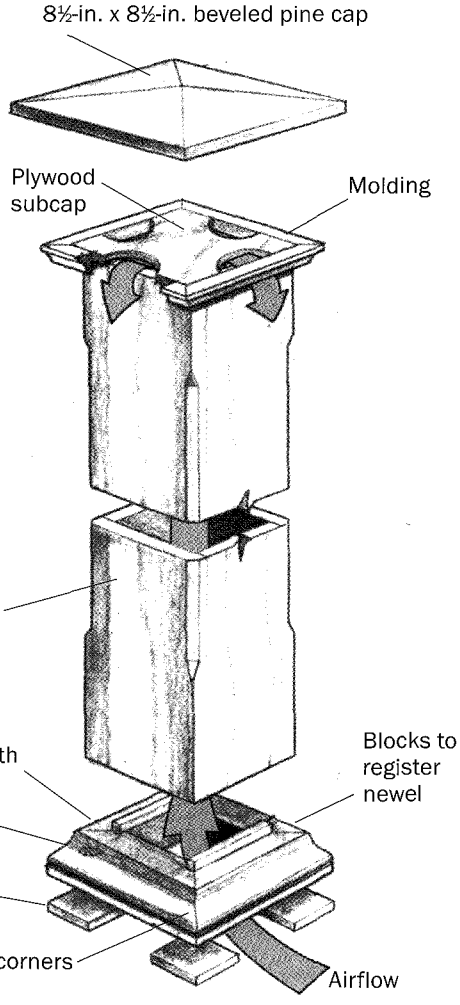
Use oil-based enamel because it dries harder and lasts longer than latex enamels, and it also has a high gloss that you can't get from latex paints.

Vented Columns and Newels

To me, installing columns and newels is the most enjoyable part of the job. This is what brings neighbors out of their houses and what seems to invite people to stop their cars and visit. The ten, 8-ft.-tall, 6-in. by 6-in. columns and the four 3-ft.-high, 6-in. by 6-in. newel posts were made from ¾-in. clear pine. The posts are simply long boxes primed on the inside and stapled together with galvanized 2-in. narrow-crown staples.

Newel-Post Construction

The newel posts are capped with two-part assemblies that vent air through four hidden holes. The newel plinths are screwed to the stair treads with 3-in. screws that pass through gaskets made of epoxy.



The trick to keeping air moving through both the columns and the newel posts is wooden plinths we make ourselves. Making the plinths takes time, but they add a finished look to our porches (compared to commercially available metal vented plinths), and we can make them any size we need. We start with a base made from shaped 5/4-in. by 2½-in. clear pine. We miter and spline the corners and glue the base together with epoxy, leaving a square hole in the middle for air to enter. We glue four 2½-in.-square by ½-in.-thick blocks to the bottom corners for feet. To the top of each plinth we then glue two blocks of wood that slide into the posts and prevent lateral movement. Once completed, each plinth gets two coats of marine epoxy. Although I don't do it, some builders install screening at the bottom of the plinth to keep out pesky insects.

The four plinths that anchor the newel posts have a 7/16-in. hole drilled through each corner. First we fill these holes with epoxy, and when it is dry we drill smaller holes through the epoxy for mounting screws. This effectively creates an epoxy gasket that prevents moisture from entering. We use galvanized 3-in. drywall screws to mount the newel plinths to the deck and the stairs. The plinths used under the columns are held in place by the weight of the porch roof and the beam.

Newel posts also need to be vented at the top, just like the columns. We start with a ¾-in. plywood subcap for each newel; we cut these to overhang the newels by 3/16 in. on each side. We then cut a 3-in. semicircular bite out of each side of the subcap. A 1-in. wide ogee molding hides the edges of the subcaps. A beveled cap made from ¾-in. clear pine is then fastened to each subcap, with a ⅝-in. overhang on all sides. Construction adhesive alone is used to install the finish caps to eliminate any nail holes and possible water infiltration. Once assembled,

ach cap gets two coats of marine epoxy nside and out.

When we are done, we have created a passageway for air to enter plinths at the bottom of columns and newels, travel upward and be vented at the top. This eliminates trapped moisture inside columns and newels and helps prevent rot.

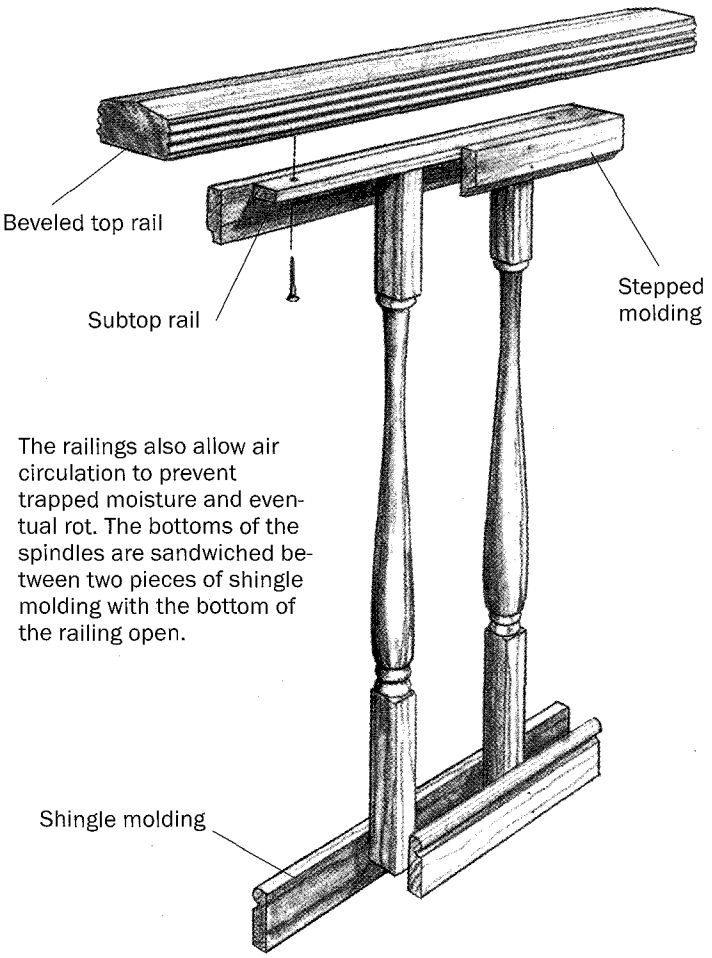
New Railings and Rinish

Once all the columns were built and installed, we took measurements for the 12 railing sections. For this porch, we used relatively standard railing components available from local suppliers. We started with turned spindles 1¾-in. square at top and bottom. They were sealed, sanded, and primed before assembly.

The spindles were spaced approximately 4 in. o.c. and held together at the top with ¾-in. by 1¾-in. subtop rails and on the side with stepped molding. On top of that assembly, we set sections of beveled top rail and sealed it with two coats of marine epoxy. To hold the bottoms together we sandwiched the spindles between two pieces of 2½-in. by 1⅛-in. shingle molding. Water can't collect around the bottom of the spindles, and air can circulate freely. Railings are installed about 4 in. off the porch deck and are toenailed to the posts with 8d galvanized nails. The three long sections of railing were supported with 4-in. high pressure-treated blocks wedged between the deck and the bottom rails. We took care to seal the end grain on all components before installation.

We primed most of our components with an oil-based exterior primer before installation. This gave the parts some protection and stability during the four-week construction phase. After completion we filled the nail holes with glazing compound and brushed and sprayed on two coats of Pratt & Lambert® Permalize® Alkyd Gloss House and Trim enamel. Our only concern was painting the epoxied components, but paint adheres well to a sanded epoxy surface.

No Trapped Moisture in Railings



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Sources

Gougeon Brothers, Inc.
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www.gougeon.com
WEST System marine epoxy

Pratt & Lambert
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