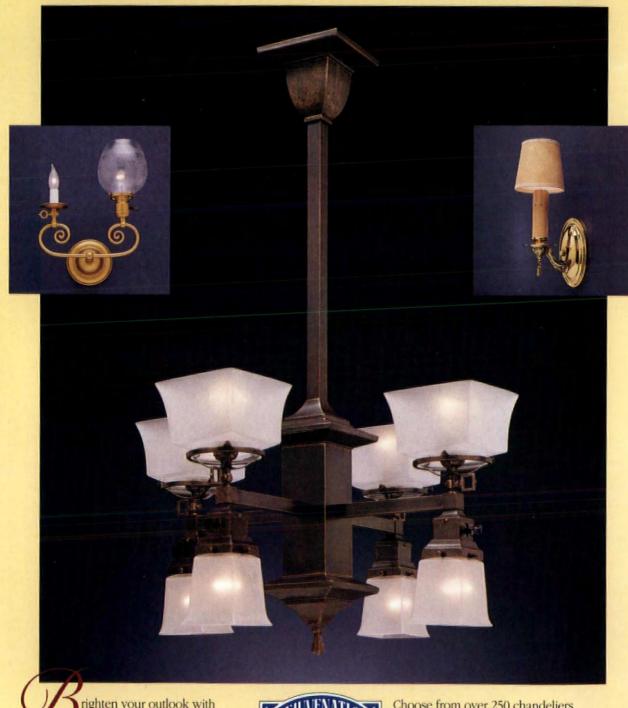


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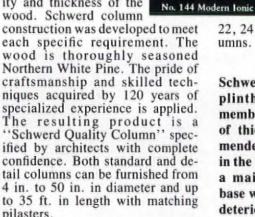
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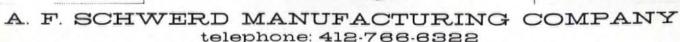


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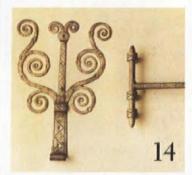
VOL. XXIII, NO. 6

8 EDITOR'S PAGE

Fun with the house from everywhere.

12 MAILBOX

Readers' responses about "unmuddling," an A.J. Bicknell house plan from 1872, and why Craftsman Farms' roof was left sagging.



14 ASK OHJ

A valuable hardware find, repairing a metal ceiling, winterizing a home, and a source for sleeping porch blinds.

18 RESTORER'S NOTEBOOK

Reader tips about filling screw holes, using old paint, easy paneled wainscot, and repairing a beveled mirror.

20 GOOD BOOKS

Guides with ideas for small and large projects. BY JOSH GARSKOF & GORDON BOCK

24 READING THE OLD HOUSE

Horseshoe-arch gables appear on many turn-of-the-century houses, but what is the origin of this recessed arch?

BY JAMES C. MASSEY & SHIRLEY MAXWELL

ON THE COVER: This stately home in Dallas, Texas, exemplifies the high style Foursquare; its classic boxy shape with a dormer and wide eaves are evidence of the Prairie style.

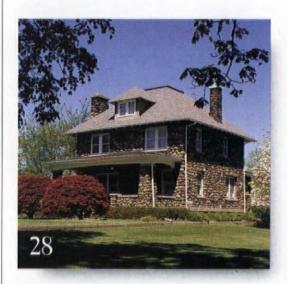
COVER PHOTOGRAPH BY NEAL FARRIS NOVEMBER/DECEMBER 1995

28 STYLE

The All-American Family House

An architectural look at the Foursquare, perhaps the most common old house. Not a house style, but a type, this cubelike construction was dressed up in the gamut of early-20th-century features.

BY JAMES C. MASSEY & SHIRLEY MAXWELL



34 HOW-TO

The Chimney Detective

You don't have to be a private eye to spot moisture problems around the chimney, but a lesson in detective work will help you ferret out solutions.

BY MARYLEE MACDONALD & JOHN WAGNER

40 HISTORY

In Search of Mantel Inserts

Answers to readers' questions about the "modern" heat in their period fireplaces—a look back at mantel inserts.

BY GORDON BOCK





E



42 TECHNIQUES Flashing Points

Flashing is the most important element of a leak-free roof. Here are three steps to caring for this oftoverlooked part of the old house's protective skin.

BY J. RANDALL COTTON



46 STEWARDSHIP How to Replace a Boiler (Without Getting Steamed!)

Advice from an expert on dealing with contractors and upgrading the heart of many old-house heating systems.

BY DAN HOLOHAN

The 1995 Old-House Journal Index



52 OLD-HOUSE LIVING

A family in Denver uncovers time capsules from former residents of their old house.

BY MARLA KILEY

56 RESTORATION PRODUCTS

Reproduction, early electric lighting, Arts & Crafts cabinet hardware, marble restoration, and more. BY LYNN ELLIOTT

58 HISTORIC HOUSE PLANS

A King's Post Victorian, a Gothic Revival Garden Shed, and a Victorian Guest House

65 EMPORIUM

Catalogs, Products & Services, For Sale/Swap, Real Estate, and Events

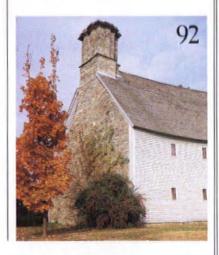
CLASSIFIEDS 65 RESTORATION SERVICES 72 PRODUCTS NETWORK 74 ADVERTISERS' INDEX 86

90 REMUDDLING

A Poke in the Eye

92 VERNACULAR HOUSES

Rhode Island Stone-Ender BY MYRON O. STACHIW



A Foursquare Recalled

S WE WORKED ON THIS ISSUE OF OHI, I was struck one day by the memory of some distant relatives and a house I haven't seen since I was a child. "Well, I'll be," I suddenly realized, "the Schactls lived in a Foursquare!"

You could have predicted it from numbers alone: built in 1909 or so; bought for \$14,000 in the 1940s; three full floors of living space in a house 21' wide. I can still walk around that building in my mind. In doing so, I bet I walk around thou-

sands-maybe millions -of Foursquares just like it.

Though there was no full-width porch on this house (just a little closed-in entryway), the front door was off-center and opened into a foyer/stairway hall, well in view of the three other rooms. To the left, through the archway, was the living room, featuring a plain

brick fireplace mantel; dead ahead lay the kitchen with a sink like a porcelain aircraft carrier; diagonally across was the dining room, separated from the kitchen by a swinging door. Four rooms to a floor, true to the basic Foursquare formula.

Originally, there was no toilet on the first floor until—with great fanfare—the folks installed one in the 1950s. Some fixtures and a mirror magically transformed a windowless storage closet off the kitchen (with shelves deep enough to stockpile a thousand cereal boxes) into a powder room. Indeed, all plumbing was to-the-point in this house, with service running off a single stack for maximum economy. The layout was so utilitarian, in fact, that someone figured it was worth the savings in pipe to leave the hot and cold faucets in reverse position at the third-floor bath.

The house, though, felt open, friendly, and generous, and there always seemed to be room for

another bed when hordes of cousins overnighted. As the steam heat came on, it would announce itself with a hiss and click of the radiator vents. and a rush of warmth like a loving hug. The basement showed signs of an earlier lifestyle. There was a former coal bin, now full of dusty steamer trunks, and a little two-burner, cast-iron, tabletop gas stove - a relic, I was told, from the days when you heated laundry water by the pot.

Who could forget that staircase. Fittingly, the balusters were nothing but square sticks. The

> rectangular newel post was a flat-topped affair lavished with a single

staircase to the third

projecting moulding, giving the impression it wore a porkpie hat. Far from unique, the staircase was so standardized it was similar to owning a classic car or a series lithograph print-you didn't have it, you had one of them. Ascending that

floor was like climbing to the lamproom in a lighthouse. The floors repeated themselves identically with every landing; push-button light switches appeared at the same spot in the wall at every storey. Up there, the roof hips cut the ceilings into interesting facets-making head bangers for an adult, but a warren of cozy halfrooms just right for a kid. The Schactls were not land barons by any means, yet the house sat on a desirable high spot, a pleasant promontory on an otherwise cookie-cutter street. Looking out the third-floor dormer window, you could see for several blocks across the rooftops of other houses most of them Foursquares too.



Vestigal Victorian ornament remained on plans like "The Luella" (1904), but Foursquares were thoroughly 20thcentury in appeal—the most house for the least money.



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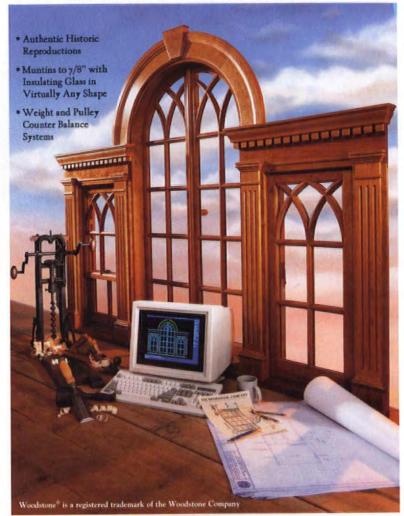
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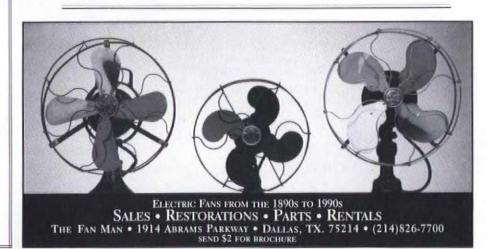
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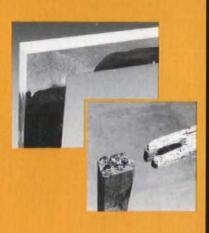
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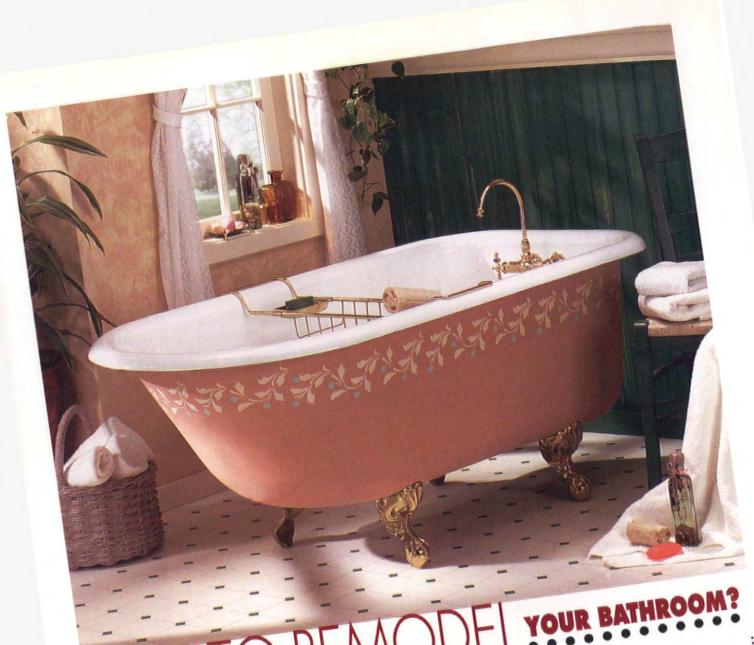


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MANAGING A JOB

Dear OHJ,

I WISH I HAD "CONSTRUCTION MANagement" (Sept./Oct. 1995) three years ago when we hired a contractor to restore our Queen Anne and to renovate a 1950s addition. Without getting into the details of our contractor relations (read: lawsuit), suffice it to say that the perspective I got from your article would have been very useful. Whether homeowners choose a contractor or a construction manager, I strongly second your suggestion that they put the agreement in writing.

-Pauline Dadona San Francisco, Calif.

FRANK TALK

I COULDN'T HELP NOTICING THAT Frank Furness's roof lines, arches, and window configurations ("Frank Furness, Victorian Pioneer," Sept./Oct. 1995) resemble Frank Lloyd Wright's architectural style, especially in the railroad station you pictured. I'm curious . . . did Frank and Frank ever meet?

— Deborah Becker Oak Park, Ill.

It's certainly possible. Yet even if they didn't, there's an architectural connection. Louis Sullivan, who was Wright's mentor, worked with Furness as a young man.—THE EDITORS



UNMUDDLING

YOUR REMUDDLING PAGE IS SO DEpressing. I'd prefer something that features before-and-after photos of a vintage home that's been restored. It would be very inspiring to homeowners who are slogging through long restorations.

- BETSY GURLACZ Western Springs, Ill.

This old-house success story comes from reader J.J. Triebold of Valley City, N. Dak.

We try to make OHJ a useful and inspiring read for restorers like yourself. Old-House Living articles, in particular, are about coping with the pitfalls and unforeseen troubles of the restoration experience, and sharing solutions and successes. Remuddling takes an alternate tack by highlighting examples of insensitive remodeling. It's a quick education about what gives a building its character and what takes it away. It's also a bit of comic relief. Nonetheless, in the interest of printing encouraging tales of old-house life, here are before-and-after photos of a successful project.—The editors

SAG STORY

I READ WITH MORE THAN PASSING interest "Craftsman of Steel" (Sept./Oct. 1995). Based upon the information presented in the well-written article, it's my opinion that straightening the ridge would have been a relatively simple task for a competent carpenter. (In my work I routinely straighten and reload far larger members.) So when the

author writes "the sag had not disappeared, but it was only an eccentricity," she begs a very obvious question: Why?

—MIKE SHANNAHAN La Porte, Texas

Good question! We asked Nancy Strathearn, Executive Director of The Craftsman Farms Foundation and author of the article. She explained that since the sag had been present for many years, it had become a historic feature of the building, so the decision was to let it remain-an approach taken with many museum properties. "With the restoration work, we were aiming to correct some structural problems," says Nancy, "rather than trying to make the building brand new."-THE EDITORS

HAVE YOU SEEN MY PORCH?

I COULD REALLY RELATE TO "PORCH Missing? Altered? Answers to Reader Questions" (July/Aug. 1995). I have removed a 1920s replacement porch from my 1886 Second Empire house (see below). I am now trying to replicate the original porches; the evidence points to



A reader calls for any information leading to an appropriate porch design for this Utah house.

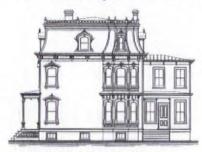
three small ones. I would be most grateful if you would print a photo of the house and ask readers whether they know of a similar building that retains its porches. Readers could contact me at 2622 Madison Ave., Ogden, UT 84401, (801) 394-2622.

-James M. Love Ogden, Utah

PLAN BOOK MATCH

THE SECOND EMPIRE PLAN SHOWN in "Identifying Mail-Order & Catalog Houses" (Sept./Oct. 1995) is almost identical to an old house in

Anderson, Indiana. Perhaps the Bicknell design was the pattern or at least the inspiration—for the



A.J. Bicknell's Village Builder was published in 1872. Here is a side elevation.

house, the relevant wing of which was built in 1874. I have two guestions: When was Village Builder published? And can you show more information about the plan?

> -CAROLYN SHETTLE Orestes, Ind.

CORRECTION: In "Identifying Mail-Order & Catalog Houses" (Sept./Oct. 1995), we listed an incorrect telephone number for Dover Publications. Call (516) 294-7000 to order the company's reprinted plan books. — THE EDITORS

PRESERVATION CONFERENCE

THE ASSOCIATION FOR PRESERvation technology will be holding its 1995 conference, entitled "Adapting to a Changing Preservation World," in Washington D.C., November 14-18, 1995. (Please note that the dates have changed.) On the schedule are sessions about changes in government, project perspectives, technology, and communications, with training courses on monuments and sculpture, historic bridges, and graphic documentation. For more information, write APT 1995 Annual Meeting, P.O. Box 16236, Alexandria, VA 22302, phone (703) 527-7620, or fax (703) 684-7301.







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What a find! A reader has 1927 hinges made by Samuel Yellin himself.

Mystery Hardware

I'm building reproduction kitchen cabinets and have some great iron hardware that was salvaged from an old house, but I don't have quite enough. I've perused catalogs and I've either overlooked the pieces or they aren't there. The frame hinge is stamped "Samuel Yellin." What does this mean, and can I get matching pieces?

—Anna Haskell Knights Ferry, Calif.

YOU'VE FOUND SOME VALUABLE ANtiques. Samuel Yellin is widely considered to have been the greatest American ironworker of the 20th century. A Polish-born immigrant, he set up his own metalworking shop as a young man in 1909 and quickly earned an outstanding reputation for the beauty and quality of his work. Besides perfecting the traditional skills of the trade, Yellin is most famous for using loose links to connect pieces of iron instead of welding them together. The Federal Reserve Bank, the National Cathedral, and Yale University all have metalwork made by Yellin. His workshop, which was open in the evenings to anyone who wanted to learn the craft, employed 200 metalworkers and had 60 forges by 1920.

Samuel Yellin Metalworkers is still in operation (run by his granddaughter) and has records of all its work, right back to 1909. They traced your pieces to a 1927 house in Pebble Beach, Calif. The company will fabricate replacement parts based on those plans. Write to Samuel Yellin Metalworkers at 721 Moore Ave., Dept. OHJ, Bryn Mawr, PA 19010, or call (610) 527-2334.

Winterizing

Can we drain the water from the hot water heating system in our 1745 house in Connecticut and leave the building unheated for the winter? If not, what is the best way to leave it unoccupied?

-Paul Bodzin New York, N.Y.

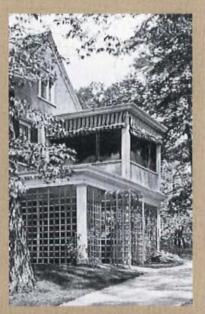
YES, YOU CAN LEAVE IT UNHEATED. You must drain all pipes and add antifreeze at any location that holds [continued on page 16]

Canvas Roll-Up Blinds

I enjoyed reading "Sleeping Porches" (July/Aug. 1995), especially since my 1903 home has a sleeping porch off our secondstorey bedroom. I have been trying for over a year to find canvas roll-up blinds like the ones in the antique picture shown in your article. These blinds are both appropriate to the period of our home and a practical solution to the heavy winds and rainstorms of the Northeast. Where might I find them?

— Joe Kalina Mt. Tabor, N.J.

canvas roll-up blinds, or curtains, as they were sometimes called, protected open, windowless porches from sun, wind, and rain. They were raised and lowered by cords and pulleys, and could be fastened in place during bad weather. Though very popular in the early 20th century—the heyday of sleeping porches—canvas roll-up blinds



Sleeping porches were often protected by canvas roll-up blinds, practical and aesthetic protection for open porches.

fell out of favor with manufacturers. We did not find a source for ready-made blinds, but here is a company that will custommake them: Strohmeyer, 211 Gate Rd., Dept. OHJ, Little Ferry, NJ 07643, (201) 641-8141.







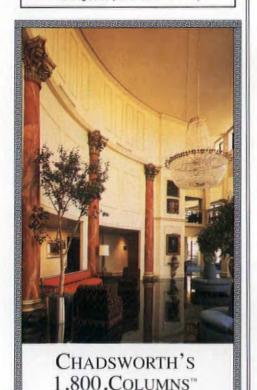
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[continued from page 14] water—such as traps and low points. Gas lines must be turned off and oil tanks either completely filled or emptied to prevent condensation. (Left empty, the tank will eventually rust.) You should shut down the electric service. Plus, the house should be ventilated, typically by installing louver vents in a number of

window openings.

However, for added protection from humidity and freezing, you might choose to leave your heat on at a low setting. This is risky because if a pipe breaks, the resulting spill can go unnoticed and lead to major damage. So, if you want to leave the heat on, you'd do best to convert the heating system to a selfcontained, closed loop. This means instead of being fed from the water supply, the system recirculates the same water, which is treated with antifreeze. It's less likely to freeze, and there's a limited volume that can spill in case of a break. A supply tank is added to account for expansion. You'll still want to take normal winterizing precautions for plumbing, etc. For more information about winterizing old houses, see "Mothballing Buildings," July/Aug. 1993.

Rusted Ceiling

In one corner of my living room, the decorative tin ceiling is rusting. I have fixed the source of the water and have tried to repair the deIf the rust goes through the metal ceiling, it'll require replacement. If not, it can be sanded and primed.

teriorated spots with several methods without success. What do you recommend?

> —Darcy Graham Canandaigua, N.Y.

IF THE SHEET STEEL THAT IS THE base of your "tin" ceiling hasn't rusted completely through, your best bet is to gently remove the rust with fine steel wool or an emery cloth. Once the metal is clean, you should apply a coat of rust-inhibiting primer and paint the entire ceiling with an oil-based paint. If the rust has gone right through the metal, your best option is to replace the damaged sections with salvaged or reproduction panels. Do not fill gaps with metal-patching material because reconstructing the detail is too difficult, but small gaps can be sealed with latex caulk.

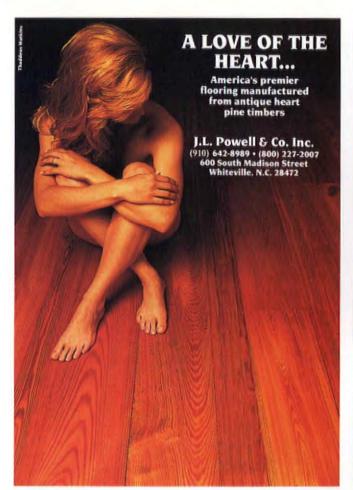
Luckily, the egg-and-dart and braid patterns you have were very common and are still manufactured, so you should be able to find a good match. Several companies still sell metal ceiling panels made from the old patterns, including: AA Abbingdon Affiliates, Inc., 2149 Utica Ave., Dept. OHJ, Brooklyn, NY 11234, (718) 258-8333 and W.F. Norman Corp., P.O. Box, 323, Dept. OHJ, Nevada, MS 64772, (800) 641-4038. See the OHJ Restoration Directory for more

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RESTORER'S NOTEBOOK

SANDING BELT

FOR SANDING THE HARD-TOreach parts of turned woodwork, I recycle portions of used powersander belts. There are always areas that aren't clogged and have plenty of life left in them. They rip readily into long, strong %" strips, which I work back and forth like a shoeshine rag. The variety of grits is unmatched by other materials, such as string, emery cloth, or rolls of sanding tape sold for the purpose.

> -SAM HERDEZ San Luis Obisbo, Calif.

WHERE'S THE BEEF?

7 HEN A SCREW HOLE BECOMES stripped, many people glue toothpicks or matchsticks in it. I've also heard of using a dowel. But I came up with a better solution when

the screws holding my original iron door latch would hold no

longer. First, I drilled out the hole to get rid of any damaged wood. Then, I tapped in a glue-covered

golf tee. A tee is the perfect diameter and it's tapered, so it fits snugly. When the glue was dry, I simply cut it flush with

a hand saw and painted. My latch screws once again have meat to grab.

Golf

tees are

to grab.

great for filling

old screw holes

in woodwork so that new screws

have something

-ELLEN GREENBURG West Hartford, Conn.

TRICK MIRROR

ERE'S AN INEXPENSIVE SOLU-H tion to replacing beveled mirror glass that's got worn silver areas.

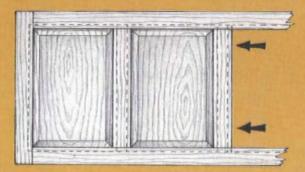
PAINLESS PANELING

Recently, I used modern carpentry techniques to replace a section of wainscot. Instead of mortise-and-tenon joinery for the frame of my reproduction wainscot, I cut an extra deep dado into the rails and stiles to hold the raised panels, which I gave correspondingly longer bevels to ride in them. Instead of tenons. I milled the rails' ends

with tongues that fit the dado groove of the stiles. This joint was plenty strong for the nonstructural framework, and it meant I didn't have to labor to mate mortises and tenons in exactly the right location along the stiles.

I simply pushed them in place against the neighboring panel.

-P.J. AARON Henderson, Kv.



Using a tongue-andgroove joint for stile-to-rail connections makes panel wainscot assemble quickly and easily.

Strip the remaining silver off with toilet bowl cleaner and place a regular mirror behind it. Our oak mantel's mirror looks new again, and it still has the look of its original beveled glass.

> -JOE RINDFUSS Pittsburgh, Pa.

COLOR-CODED TOOLS

N THE FIRST DAY OF MY APprenticeship, the carpenter asked me to name my favorite color. On the second, he handed me a can of blue spray paint. Since then all of my tools have a blue spot on them. Because of the identifying mark, I have been able to avoid losing many tools on jobsites with numerous workers. I still have some from my apprenticeship days.

> -JIMMY TUCKER Charlotte, N.C.

OLD PAINT

T F YOU ARE USING OLD PAINT FOR touch-up work and find that it is contaminated with dried paint or debris, try the trick my grandmother showed me. Cut off the end of a nylon stocking and stretch it over the can. When you dip your

brush in the paint, simply push the toe of the stocking down in. The paint will come through to fill your brush, but the lumps won't.

> -PETER WONG Spokane, Wash.

A nylon stocking filters old paint as you use it.

Share your solutions! We'll pay \$25 for hints that we publish. Send shortcuts and problem-solving ideas that might help other oldhouse owners to: Notebook Editor, Old-House Journal, 2 Main Street, Gloucester, MA 01030.



From Weekend Warriors to Project Managers

BY JOSH GARSKOF AND GORDON BOCK

These two guidebooks explore home maintenance and improvement from very different perspectives—a micro view of clever, around-the-house techniques, and a macro look at planning and managing large projects. No matter what your old house's condition or age, you're bound to find one of these volumes useful.

Rader-Supplied TIPS AND TRICKS-OF-THEtrade have been a staple of how-to periodicals for over a century, so when one of the largest circulation home-maintenance magazines in print today decides to collect a dozen years of ideas

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ORDER FROM READER'S DIGEST BOOKS, READER'S DIGEST ROAD, PLEASANTVILLE, NY, 10570-7000; (800) 846-2100. (1995; 384 PAGES HARD-BOUND; \$30 PPD; ISBN# 0-89577-617-0.) between two covers, it's worth a look. The Family Handyman Helpful Hints is a compilation of 2,000 items sent to The Family Handyman magazine by its subscribers. In format, the information is much like OHJ's "Restorer's Notebook" (though each subject is not specifically related to old houses), but the sheer breadth of the material makes Helpful Hints one of the most comprehensive books" around.

Open to any page and you'll find a trick that leaves you wondering, "Why didn't I think of that?" For changing high light-bulbs, wrap a lamp shade clip with electrical tape and fasten it to a broom handle. For a small repointing job, fill an old caulking tube with mortar. Use bungee cords to clamp a newly glued-up chair. It's these small-scale, high-frequency jobs that *Helpful Hints* makes easier.

Rather than step-by-step instructions for complex projects, these hints are simple, well-illustrated procedures and time-saving ideas for common repairs and tasks. There's basic instruction too on using hand and power tools, as well as yard and garden information—even the correct height for lawn grass!

IN CASE YOU MISSED IT THE FIRST TIME AROUND, A Consumer's Guide to Home Improvement, Renovation & Repair is back in a new edition. Bookstores are awash these days with guides on the maintenance and repair of houses, but this book is unique. It walks the reader through all the standard improvement projects, analyzing the skills needed, the costs of various materials, and the relative expense of hiring a contractor or doing it yourself.

A Consumer's Guide is a how-to book, but its focus is not so much the actual work as the values that make it cost effective. It should come as no surprise. The authors put the original edition together for The Enterprise Foundation, a research organization devoted to affordable housing. James W. Rouse, who co-conceived the Foundation and wrote the Guide's foreward, is the man who showed that preservation can be profitable with projects like Boston's Quincy Market.

First published in 1990, the 1995 edition has been completely updated to reflect costs in today's market. For example, the chapter on flooring starts with an overview of how to sand, repair, clear-coat finish, paint, or replace wood floors. Then a large chart lays out the options. Painting would cost an estimated \$0.53 per square foot for a homeowner doing the work; \$1.25 for hiring a contractor, and so on.

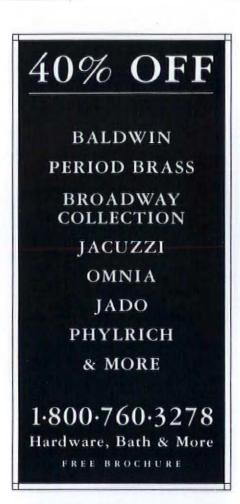
Chapters cover all the common oldDon't even think of starting any home repairs without reading this one-of-a kind book.

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house projects, plus difficult subjects such as energy conservation, working with contractors, and shopping for tools and materials. After all, no matter how much restoring an old house becomes a labor of love, it's still a major investment of time and money.



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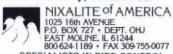


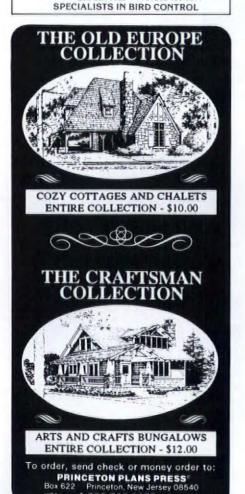
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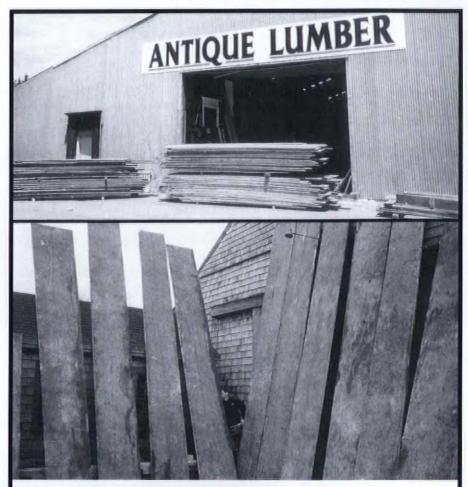
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Corralling "Horseshoe" Gables

BY JAMES C. MASSEY AND SHIRLEY MAXWELL

IKE MANY HOMES BUILT JUST BEFORE OR AFTER the year 1900, this dignified stone house belonging to Christian Hansen and Pat Galligani does not fit neatly into any one of the convenient architectural screens. With its nearly cubical main block and characteristic early 20th-century pyramidal roof, it is almost a Foursquare (see "The All-American Family

House," page 28). Yet the Queen-Anneish complexity of the projecting bays and cross-gabled roof rules out any such straightforward identification. Just because it is not in lockstep with a specific style, however, does not mean it lacks personality.

Far and away the most distinctive feature of this striking house is the large, horseshoe-arch-shaped eave that curves up under the many gables. These unmistakable gables show up occasionally in houses built around the turn of the cen-

tury, and this is not the first time OHJ readers have brought them to our attention. Here, the horseshoe-arch motif is echoed in the porch gables, and all the gables have a decorative device within the horseshoe. The owners tell us the large gable on one side of the house frames a Palladian window; facing the camera, each gable holds a diamond-shaped window, like some mystical penetrating eye. Diamond-shaped features such as these appear frequently in pattern books, although arched or recessed windows are more common.

In fact, we discovered the greatest number of these arched gables in mass-market architectural pat-

tern books, particularly Hodgson's small pattern book Practical Bungalows and Cottages for Town and Country, and Radford's Artistic Homes, both from 1908. Sometimes called "recessed gables" in their day, a few appear in mail-order architects' catalogs, including Barber's Art in Architecture (1902-1903) and his Modern Dwellings (1898). Although we couldn't find any in the Sears precut plan books, a good example is featured in an advertisement for concrete block machin-



The owners tell us their Merrill, Wisconsin, house dates from the late 1800s. The two identical corner entrances are unusual, not so the many gable arches.

ery in Sears 1910 catalog of building parts.

Looking over such tempting - but sketchy - evidence, what then can be said about the origins of this projecting arched gable? There seem to be two immediate predecessors. One is the Eastlake or Queen Anne

GABLE-ARCH

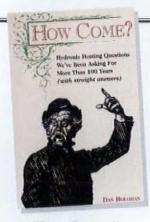


A gable-edge balcony from Shoppell's Design #517 (1887)









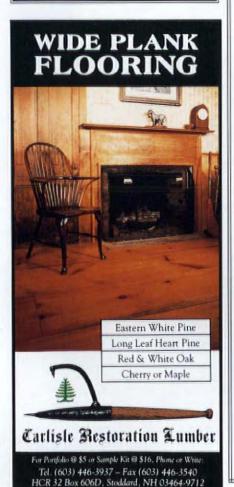
How Come? "Because it's the book on hot water heating."

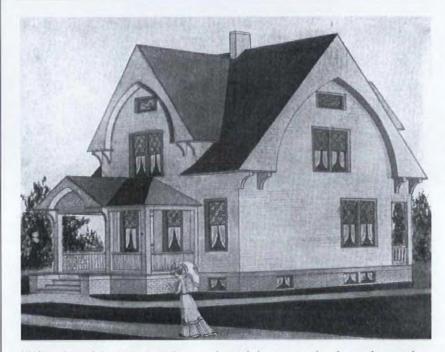
OHJ contributor Dan Holohan gives you over 600 straight answers to direct questions on just about every type of hydronic (hot water) heating system built during the past 100 years. 185 pages of text, and great illustrations. Plain-English explanations of everything from turn-of-the-century gravity hot water heat to radiant floor heating.

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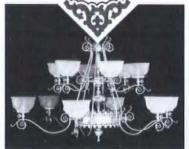
High-style architects seem to have eschewed the recessed or horseshoe-arch gable, but it spiced up the plans of many mail-order designers, such as this William Radford house from Artistic Homes (1908).

custom of filling parts of the gable with fancy turned woodwork. This kind of elaborate Victorian decoration is commonly encountered, and in some cases it leaves the equivalent of an arched opening. Barber's design #59 from Cottage Souvenir No. 2 (see page 24) is a good example. The other precursor is a gable opening that includes a balcony at the gable edge with the wall recessed. This device produced a similar effect, as in Shoppell's design #517 from Modern Houses. These Eastlake and Queen Anne features were often simplified, as in the Shoppell design, to an unornamented arched recess with plain railing, suggesting an early Colonial Revival influence. We have even seen an early example: an 1826 Greek Revival house in Vermont with a two-storey pedimented porch where the pediment is opened by a large arch with a railing (and a recessed attic behind it).

It seems to us, then, that this eve-catching horseshoe-arch gable, illustrated so well in the Wisconsin house, is an attempt to create a new design form out of early experience. It may even recall the 17th-century tradition of projecting attic gables. The more recent phenomenon appears to have been very short-lived, judging by its prompt disappearance from pattern books of the period. That it did not make it into the early Sears precut catalogs is also telling and suggests that it ran its course within roughly a ten-year period. (According to their ads, the gable went well with concrete-block houses, but it does not seem to have survived this building craze either.) We would guess that no houses were built with this gable after World War I.

Anyway, here we have a house that is handsome, definitely turn-ofthe-century, and distinguished by a nice combination of rusticated stonework and bold features. Was the use of the horseshoe-arch gable more widespread than we suspect? Was it a national phenomenon, as seems likely, with the designs coming from pattern books? We'd be interested to learn what other dates, design sources, and examples OHJ readers can add to this puzzle.

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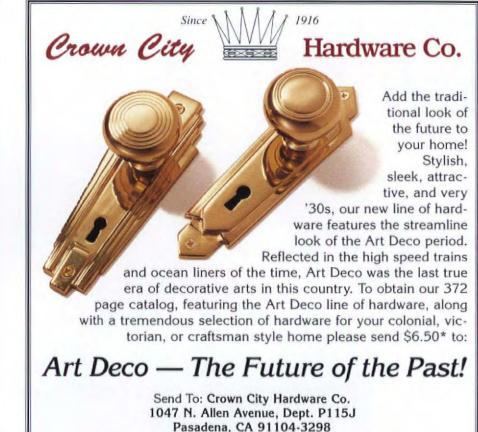


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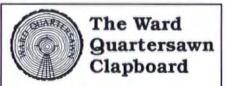
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THE ALL-AMERICAN FAMILY HOUSE



A LOOK AT THE FOURSQUARE

By James C. Massey & Shirley Maxwell

was held among the burgeoning middle class of the early 20th century, the Foursquare would've won hands down. Today we don't give them much thought, but Foursquares (also known as American Foursquares) are the good neighbors of the suburbs—sensible, trustworthy, not too exciting but nice to have around. • Although few were built after 1930, their blocky façades make up a large part of the landscape in city

LEFT: Rows of Foursquares, such as this pair in Denver, Colorado, march in a unified front along the suburban streets of the United States. ABOVE: This vernacular example in Shenandoah County, Virginia, is as simple and plain as the type can get.



This Pennsylvania house with full Palladian windows in the large dormers echoes the early Colonial Revival style.



BELOW: Many Foursquares have Prairie School influences in their wide eaves, but this example in Oak Park, Illinois, is the real thing. Built in 1900 by architect Eben E. Roberts, it has the horizontal emphasis and a porch that is particularly Prairie School in design. Only the Palladian window in the dormer suggests the influence of the eastern United States.

fringes, suburbs, small towns, and rural areas across the United States. You can't miss the solid, two-storey fronts, no-nonsense pyramidal roofs, blunt dormers, overhanging eaves, and deep, plain front porches. Foursquares are reminders of the housebuilding boom that occurred before the Great Depression.

The Name Says It All

A FOURSQUARE IS A SQUARE HOUSE WITH four, almost equally sized rooms laid out

like a grid, one per corner. So what if it's not always quite square? Or if there are three unequal rooms instead of four equal ones? You get the picture. That name has the ring of truth, even though it was coined in the 1980s—a hundred years after the Foursquare's pre-1890 birth.

Foursquares do bear a family resemblance to earlier house types, such as the 18th-century, center-passage Georgian block and the 19th-century Greek-Italian cube. They all share hipped roofs and façade symmetry—but that's only on the surface. At heart, Foursquares were more flexible than their older cousins.

In fact, the Foursquare can't properly be called a "style." It's a basic box that is presented in one of several stylish wrappings from Prairie School to Colonial Revival. Granted, these wrappings are fairly plain.

A Style for the People

FOR THE MOST PART, PROFESSIONAL ARCHItects gave the Foursquare a wide berth, finding it too limiting for their creative sensibilities. Instead, popular literature of the era, such as Gustav Stickley's Craftsman mag-



azine and the oceans of house catalogs, spread the type.

Foursquares struck a chord with the new, house-hungry working and middle classes because there were a number of practical advantages. To a generation rebelling against their parents' addiction to ornament, Foursquares were not Victorian, not Queen Anne, not even remotely 19th century in feeling. Besides being more stylish, they were also cheaper to build because there were no towers, turrets, sweeping verandahs, turned ornament, or other lah-de-dah stuff to pay for or maintain. The lack of elaboration fit well with this egalitarian society's demand for simple building materials that made no false claims to richness.

Foursquares also suited modern building techniques and materials. They were constructed in almost any medium—from a conventional frame covered in weatherboards, shingles, or brick veneer to solid brick, cast-cement blocks, or poured concrete. After a somewhat suspect begin-

ning in the 19th century, modem concrete became a reliable and fully accepted building material; portland cement stucco was especially popular for the smooth wall surfaces most preferred by Foursquare builders.

The Foursquare's early years saw much imitative use of cast-cement block with textured surfaces imitating rockfaced ashlar stone. The blocks were fabricated on the spot

with a block-making machine from Sears, Roebuck.

The Persuasion of Practicality

what really clinched the foursquare's spot in America's affection was its practicality. That cubical shape made the most of every buildable inch, taking full advantage of small lots and tiny building budgets. Built above a high basement, Foursquares were generally two or three bays wide, two to two-and-a-half storeys high with a hipped or pyramidal roof sporting prominent dormers to light the extra half-storey. Occasionally, symmetrical wings were added to expand the



building envelope and to relieve the boxy look of the exterior; vestigial, center-front square towers or rounded corner towers were even less frequently built because that boxy look was the cherished essence of the Foursquare. After the house was constructed, the Foursquare made the most of the re-

maining building lot—not just the front porch, but also the sides and rear of the house where large windows and French doors brought in the outdoors.

The Foursquare entrance was most often off-center, set into one front-facing

comer of the house, sheltered by a capacious front porch featuring restrained use of Colonial Revival or Arts & Crafts—style ornament. Sturdy piers of brick, stuccoed concrete, or shingled wood were topped with round, unfluted Tuscan columns or substantial square posts of wood or concrete. The porch had plain, bracketed eaves on Craftsman-style houses or broad, flat boxed cornices on Colonial Revival ones. A frontgabled porch, distinctive to the bungalow, turned up on Foursquares, covering only half of the first-floor front wall. Also, as a result of the bungaloid influence, a postless pier on the front steps was common. In the

ABOVE: In Kensington, Maryland, this unusual Foursquare is distinguished by a projecting bay on the second floor, which rises to form a dormer with a bull'seye window. LEFT: The classical porch columns and brick quoins are notable features on this Norfolk, Virginia, home.





This large Foursquare in Sedalia, Missouri, replete with porte cochère has an unusual formality, marked by a Beaux Arts front porch.

largest Foursquares, the porch turned the corner at one side, in a manner reminiscent of the Queen Anne porch. Balusters were simple, rectangular, and replaced below the handrail by a solid half-wall of brick, stone, shingles, or whatever comprised the wall surface of the house.

The front door also appeared in the center of the front façade. Sidelights were a sometime affair, and there might be only one rather than two. Instead of a beveled or stained-glass transom, the entire door was glazed, with the lights set in a striking grid pattern. Window sash were 1/1, 2/1, 2/2, or, if a colonial effect was sought, 6/1 lights. The use of paired or even triple windows proliferated. A multiple-window arrangement was often used in the living room, though larger houses might have double windows in almost every room. Dormer windows were de rigueur. Sometimes one or more dormers with single, paired, or triple windows were on each side. The hipped or shed roofs of the dormers had exposed rafter ends; gables and low arches were far from unusual. In this era of unrelenting simplicity, the dormer only occasionally displayed anything as showy as a three-part Palladian window.

The flat-surfaced walls were left intentionally blank, although a change in materials-from stucco to shingles, for instance—marked the upper and lower parts of the building. Decoration was likely to consist of a belt course (or stringcourse) of darker-colored masonry running horizontally between the first and second floors. Some houses, particularly ones touched by Prairie School influence, had the belt course tucked under the sills of the second-floor windows. creating a shirtwaist effect—the name often applied to this variation. A middle-class, trickle-down version of the Prairie School with horizontal lines, generously overhanging eaves, and rectilinear simplicity produced some of the handsomest Foursquares.

Unlimited Design Versatility

THE FOURSQUARE'S APPEAL WAS DUE PRImarily to family living-the most house for the lowest cost and a dignified appearance. Conventional, yet contemporary. Sub-

This Illinois residence, designed by Frank Lloyd Wright, was touted to be "fireproof" in a 1907 edition of Ladies' Home Journal.



stantial, not flashy. The sort of thoroughly middle-class house everybody would build if everybody had good taste—and just about everybody did build it, usually without

benefit of an architect's direction. Amazingly, the resulting houses were not cookie-cutter replicas, despite the ubiquitous catalogs and their near-identical entries. The versatile Foursquare accepted endless tailoring to suit the individual buyer.

For example, the front door often opened directly into the living room, but just as often, there was a side hall, a center hall, or a vestibule. These spaces were definitely not the elaborate great halls

with inglenooks and massive fireplaces of previous years. Stairs were also not a major design feature, tucked unobtrusively into a rear corner of the front room or the center of the block.

In Blauvelt. New York, builders

used local materials to construct

the postless piers on the porch.

this cobblestone Foursquare. Note

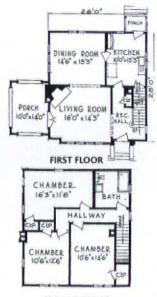
On the first floor, the focus was on the living room, which stretched across the

entire front or side of the house (if the entrance hall had been sacrificed). The dining room got equal billing with the living room, and breakfast rooms were a popular

amenity. Mindful that the woman of the house was likely to be doing housework alone, designers made sure that her kitchen was a conveniently located, efficient, and reasonably attractive area with built-in cabinets and modern built-in appliances. Breakfast nooks provided a space-saving, modern alternative to tables and chairs.

When the Great Depression cast a sudden chill over the nation's building boom, the pop-

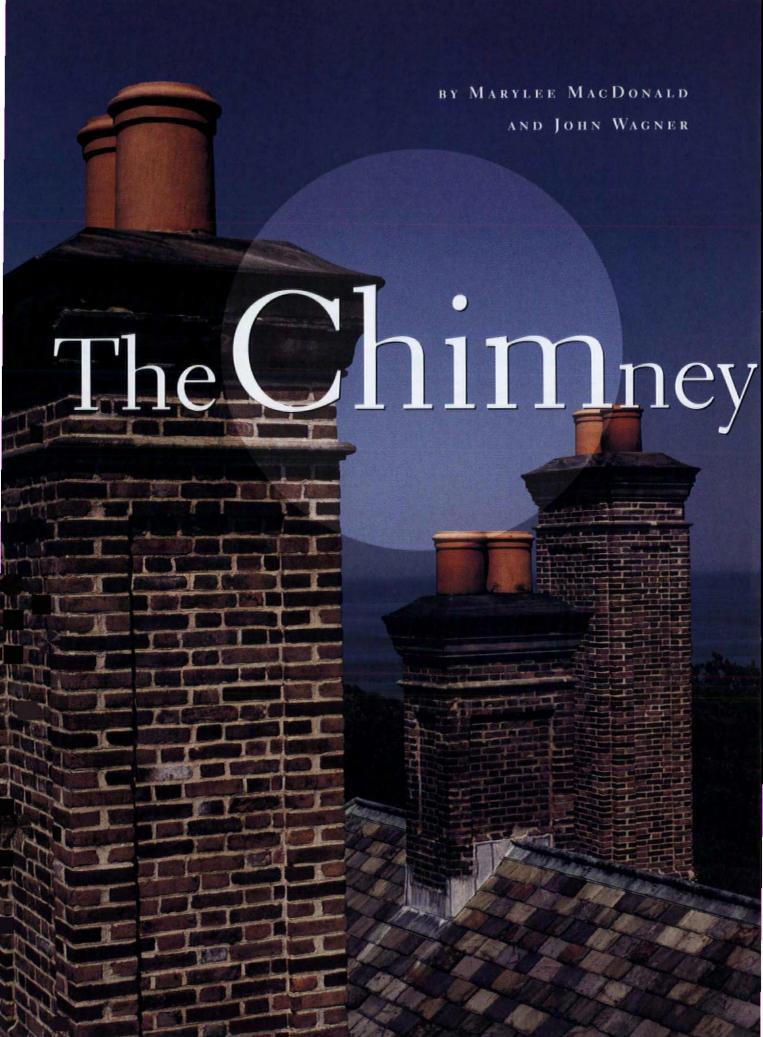
ularity of the Foursquare began to wither before the onslaught of the post-World War I Revival styles, particularly the Colonial Revival. When building resumed 15 years later, after years of housing shortages exacerbated by World War II, the Foursquare had long since breathed its last.



SECOND FLOOR

ABOVE: This Foursquare floor plan has a side front entrance. The rear service porch was a practical feature that often had a pass-through window for ice delivery. BELOW: Some Foursquares look very urban, others very suburban. In Maryland's Sudbrook Park, the wraparound porch and rather open—and uncommon—four-window front create a relaxed look.





THE CLUES: Brown stains on the ceiling of an upstairs bedroom. Salt and creosote buildup on the chimney in the attic. Wallpaper peeling above the mantel. Just what is causing moisture around your old chimney? Put a roofer on the case and you might get asphalt compound over your flashing. Bring in a mason and you may find the answer is a repointing job. Hire a furnace specialist and you could wind up with a new heating system.

Detective

TRACKING MOISTURE AT THE STACK

WHICH FIX WILL SOLVE THE CHIMNEY MYStery? Since only you have a big-picture view of your old house, it's worthwhile to become a chimney sleuth. This article will show you how to trace chimney problems, and help you decide which professional's services you need, if any.

Investigation

MOISTURE PROBLEMS CAN BE SUBTLE, WET plaster, peeling wallpaper, rotting wood, foggy windows, and drips often show up far from their sources. Luckily, they leave a trail. FOLLOW THE STAINS: Since the most common evidence of chimney trouble is moisture, that's where the probe begins. Look at the walls adjacent to the chimney, and follow the moisture to the attic. Bring a powerful light. Look at the rafters, roof planking, and any other nearby wooden elements of the house. Is the wood moist to the touch? Does it have any black powdery mold growing on it? Is there white streaking? Is the wood splitting, decaying, or rotting? Take a screwdriver, and poke it into the wood. If it goes in more than 1/8", you probably have moisture problems. If stained wood is dry, however, you may be encountering evidence from an old leak that's already been fixed. Gauge moisture by touch or, better, with a moisture meter. Come back up to the attic during or right

after a heavy rain to see if the wood is wetter. If you can see water coming in, do your best to locate the point of entry. With chalk, mark the highest point where water damage is visible. Another good trick is to go into the attic during a sunny afternoon and look for light streaming through the roof.

If you find moisture in the wood surrounding your chimney, chances are you have a leak where the chimney penetrates the roof. Metal flashing is used to make this joint watertight, but if the flashing fails, water will get in.

efflorescence (bubbly, white powder) that comes to the surface by capillary action if the chimney has gone through wet-dry cycles. In chimneys without flue liners, you may see stains on the outside of the brick where dark, caramel-colored creosote has leached out from inside the chimney. Creosote condenses out of the smoke as it cools. If you find creosote on the exterior of the chimney (or on walls), it means you may have excessive creosote buildup on the interior, which is a fire hazard. It may also indicate that your mortar (and possibly even brick) is too porous.

Take a pen knife and dig at the mortar. Is it loose and crumbling? Does more than a ¾" of mortar easily fall out when you dig at it? If so, your mortar is probably not



ABOVE: Circumstantial evidence; stained plaster shows up near the chimney. OPPOSITE: Chimneys can offer picturesque detail to old-house architecture. They also penetrate the roof, offering likely places for water to get in.



It appears someone attempted to repair this crumbling chimney by parging it, a method which clearly did not succeed.

CAP

keeping out water and you may have found the source of the moisture.

Look at the chimney cap. (If you're nervous about heights, use binoculars, a telescope, or a camera with a 400 mm lens to inspect your chimney above the roof.) A common mistake is to attach the flue liner to the cap with mortar. As the flue liner expands and contracts with heating and cooling, the chimney cap works loose. Water can then enter the space between the flue liner and chimney and degrade the mortar. That could be causing your problems.

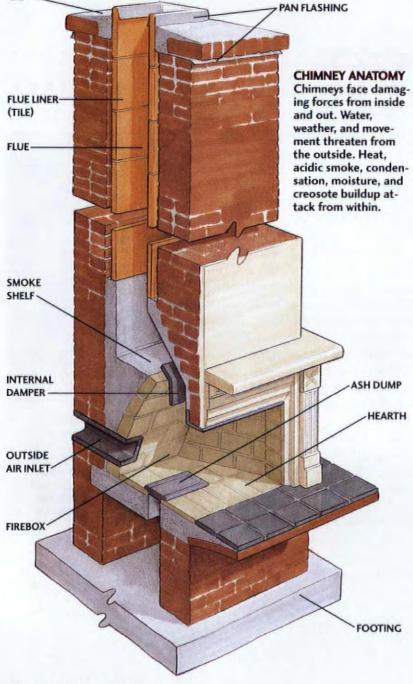




TOP: Creosote on the exterior of the chimney means big problems: condensation, interior creosote buildup, and deteriorated masonry. ABOVE: Sometimes soft brick was used to build chimneys. This masonry does not stand up well to flue gases or weathering.

spect the chimney's general state. If it's on an exterior wall, is it pulling away from the house? If a chimney shifts position, the movement may knock bricks and flue sections out of line, opening up mortar joints where water can enter. Look above the roof. If the chimney is leaning to one side, it may need structural work, however, that will take professional analysis.

At its base, the chimney should rest on thick, reinforced masonry. In very old houses, brick arches were used to support the hearthstone. Sometimes a chimney's masonry underpinnings are insufficient; seismic activity has settled the heavy stack; or its weight has compressed the soil. (Unstable clay soils, such as those in Texas, also contribute to chimney movement.) In these cases, major masonry repairs may be required.



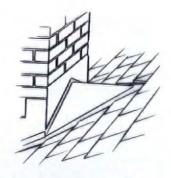
TEST AT THE FIREPLACE: A common source of moisture at the base of the chimney is rain water that falls directly down the flue. Check this during a rainstorm. Place a single sheet of newspaper at the base of the flue (in the firebox or an opening for a woodstove) and see if you get drips. If you do, try temporarily capping the chimney top (or having a contractor cap it) with a piece of plywood. If the lid prevents rain from getting in, your chimney is missing its cap, or the cap is damaged-easy problems to solve.

USE THE PROCESS OF ELIMINATION: If you rule out exterior water penetration, the moisture may be from condensation inside the chimney that's soaking through. Detecting this sort of problem is tricky. If you have a persistent moisture problem in your walls, but a dry attic, check for moisture near the top of a tall chimney, or drips or rust in the metal pipe running from your furnace to the chimney. They may indicate a condensation problem.

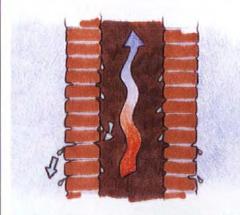
Here's what causes condensation. Combustion produces H2O. It's in the gaseous exhaust that wends its way up the flue. If the exhaust falls below the dew point (135° F), the moisture condenses on the chimney walls. Four gallons of water can condense on flue walls in 24 hours of heavy chimney use.

Ironically, the high efficiency of stateof-the-art furnaces has exacerbated moisture problems in old chimneys. Coal exhaust was hot enough to carry that moisture away. Modern heating appliances, however, recapture exhaust heat. That means the gas starts up the old flue at a much cooler temperature, and it takes less exposure to drop it to the condensation point. Think back to when the moisture problems started. Did your walls start staining during or soon after the first winter you used a new, higher-efficiency furnace?

Unlined chimneys, where the gas is not insulated from the cold, and tall chimneys, which take a long time to pass the vapor, are particularly prone to condensation. A flue liner is designed to insulate the exhaust so it stays above the condensation point and to shed condensate - both moisture and creosote - back down without al-



cricket is a mini-roof that channels rain to the sides of the chimney.



Smoke cools as it rises up the chimney. If the stack has no liner to insulate and protect it, the exhaust may condense, leaving creosote buildup and water to corrode the masonry.

The Big Sweep

As smoke climbs the chimney, it cools. If it cools enough to condense on the flue walls, it leaves a highly flammable residue behind. Coal and oil combustion leave black soot; wood burning leaves gooey creosote. When the buildup gets thick, a spark can ignite the chimney in a super-hot blaze that often burns the house to the ground.

To limit creosote buildup, use only dry, seasoned wood, which burns hotter, farther from the condensation temperature. Building

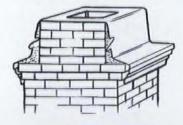
small fires instead of large ones means the fire burns hotter and goes out more quickly. Do not restrict smoke's flow up the chimney by closing glass doors and vents, and make sure that the damper is fully opened. To avoid sending sparks up

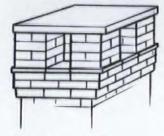


the chimney, don't burn cardboard boxes, wrapping paper, or Christmas trees in your fireplace. (Flue liners also help to insulate exhaust from the cold outside.)

The most effective fire prevention is regular inspection and cleaning. Some specialists recommend bringing a chimney sweep in annually, but it depends on the level of usage of your chimney, as well as other factors. One old-time rule of thumb has it that a flue should be cleaned when the creosote buildup is the width of a dime. It's not a bad rule. For more information

about preventing chimney fires, or for a list of recommended chimney sweeps, contact the National Chimney Sweep Guild, 16021 Industrial Drive, Suite 8, Dept. OHJ, Gaithersburg, MD 20877, (800) 536-0118.



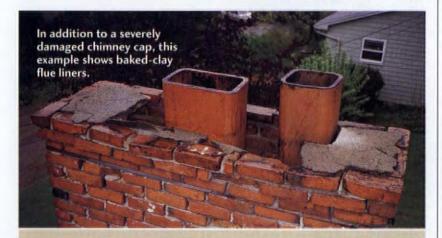


Two approaches to limiting water's access to the flue: a metal cap (top) and a stone or concrete top (above).

lowing it to wick through the masonry chimney. However, even when the chimney has a flue liner, condensation moisture can seep out where flue sections meet.

northern winters, condensation can also show up on the interior of windows. If the windows fog up substantially when your furnace fires and the problem disappears when it's off, moisture may be escaping through a crack in your heat exchanger. If you have a condensation problem that's related to the furnace's cycle, call your heating contractor immediately. Carbon monoxide may be escaping into the house via this route.

Chimney condensation can also result from high indoor humidity in a weathertight house. Using a humidifier during heating season, or unvented showers, and some big kitchen appliances, may create condensation problems as warm, moist air rises up the chimney.



Liner Notes

Most 20th-century chimneys were built with baked-clay liners. Before that, special high-temperature mortar was parged over the interior of the chimney. Very early chimneys may have no protective interior at all. You may also encounter retrofit liners, which can be masonry or metal, square or round. If the chimney has no liner, the masonry box itself is also serving as the flue—a potential problem.

Whether or not you have a flue liner will greatly affect how you solve moisture problems. Go to your chimney around noon. If possible, remove the woodstove pipe so you can look right up the flue. Bring a strong light and a mirror. With the natural light from above and the light you carry, position your mirror to see what's there. If the flue has no liner, you will see the inner brick wall of the chimney or parging; if you have a tile flue liner, the surface of the stack will probably be smooth, like a pipe; metal and concrete liners will also show themselves. Any of these surfaces will be significantly blackened.

Repair

ONCE THE SUSPECTS RESPONSIBLE FOR YOUR chimney-related moisture have been ID'd, here's how you can arrest the problem.

FLASHING: The seal between chimney and roof is the most likely source of water penetration. The cheapest solution is to have a roofer apply roofing cement and fiber-

glass tape to the joint where the chimney and roof meet. For small leaks, this might squeeze a couple more years out of an aging roof. To fix a persistent leak, though, you may need to tear off old roofing so that proper flashing can be installed under it.



If flashing doesn't lay properly, water can get through.

Build up a war chest, because this is expensive. (For more about flashing, see "Flashing Points," page 42.)

- **CRICKETS:** If the chimney shows evidence of long-standing moisture penetration at the roofline, consider asking your contractor to install a *cricket*, a small peak on the uphill side of the chimney (see page 37).
- PAN FLASHING: Windblown rain can enter the space between the flue liner and the interior chimney wall. It won't show up at the base of the flue in our newspaper test, but it may appear as damage to plaster walls or framing members. The problem can be solved by pan flashing (see page 36). A mason will bridge the space between the flue and the chimney's inner wall with a piece of metal flashing that funnels the water away from the flue and through weep holes to the outside of the chimney.
- REPOINTING: If the mortar is degraded, crumbling, or has fallen out, you will have to repoint the masonry. Choose a mason who has experience in matching old mortar's hardness and color (see "Mastering Brick Maintenance," May/June 1994). If bricks have deteriorated or fallen out entirely, your mason will have to match the brick, or stone, as well. That may require removing a brick and tak-

ing it to a yard where recycled or antique bricks are sold to find just the right replacement.

F CHIMNEY CAP: A good mason can fix a poorly installed chimney cap. The simplest



Skillful repointing looks just like the existing masonry. New mortar and replacement brick must match the originals.

chimney cap is sheet metal that is made to the shape of the chimney and slips over the sides about 6" down. Nails into the mortar joints hold it in place. Because the flue liner expands and contracts, the chimney cap can't be structurally connected to the flue liner. A more durable chimney cap extends further

down the chimney, encapsulating any projecting masonry (see opposite).

There are other chimney-top alternatives. A stone, or concrete, slab can rest across the top, leaving exhaust space on the sides (see opposite). Or you can extend the flue with a chimney pot (see page 34). You'll still need to cap the chimney, but the chimney pot will rise above it, limiting the amount of open area collecting water to only the cross section of the flue itself.

- FLUE FAN: Condensation moisture in your flue can be a real problem. The simplest, and least expensive, solution is to have your heating contractor install a fan in the metal flue pipe leading from the furnace to the chimney. This fan will drive exhaust air out of the flue before it has time to cool.
- FLUE LINER: If you don't have a lined flue, or if your flue design is not preventing condensation, you may have to install a new flue liner. The cheapest, and most commonly found liner in old houses, is clay tile. Problem is, they're thick and can reduce the smoke chamber considerably. Also, their seams are prone to creosote buildup and their mortar joints eventually degrade. Stainless steel liners are thinner and relatively cheap. The third option is to line the chimney with high-temperature mortar. A rubber hose is inserted in the chimney and then blown up like a balloon

Chimney flashing should be counterflashed, or set into masonry joints. This is accomplished by removing the mortar joint, inserting the edge of the flashing, and repointing the seam. The layout can vary, but each piece must overlap the one below.

to the desired flue size. Refractory concrete mix is poured down around the form and allowed to set up. For each of these processes, a mason may have to dismantle portions of the chimney, especially for chimneys with bends.

SIDEWALL VENTING: The ultimate decision. of course, could be to avoid using the old stack at all. Some new, high-efficiency furnaces can be vented out a sidewall. However, this requires changing your fuel-burning water heater's exhaust system as well. (Electric water heaters don't have to be vented.) If you leave the water heater hooked up to the chimney, its flue gas will also be likely to condense in the flue. The flue must be resized for the water heater alone, and this means installing a narrower flue liner. You can also replace your water heater with one designed to vent out a sidewall. Retrofit fans can combine water heater and furnace exhaust and vent them through the sidewall.

Another case solved. Your old house will be protected from offending moisture.

Marylee MacDonald, Evanston, Ill., and John Wagner, Montpelier, Vt., are former contractors who work as consultants and technical writers.

Flue Sharing

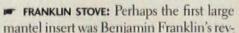
Check to see if the same flue is used by more than one appliance-woodstove, fireplace, furnace, or water heater. A gas water heater and gas furnace are allowed by code to share the same flue, but appliances using different fuels, such as wood and oil, must have separate flues. Their exhaust is at different temperatures and shouldn't mingle. You may be able to determine that a flue has multiple users by placing your hand in the flue, at a stove pipe opening, or above the flue (on the roof), and feeling for exhaust when you know various mechanicals are firing. This may require an expert's trained eye.



u Zearch

REESTANDING FIREplace grates are ancient and often studied, but what's the history of the more recent mechanical heaters that inhabit so many old-house hearths? Like aliens among the

andirons, they're regularly sighted yet thinly documented. "No one seems to know anything about this contraption in our fireplace," is typical of the letters and photos OHJ receives every fall. With questions like this in mind, here's some notes on the various kinds of mantel inserts we've heard about.



olutionary "stove" of 1744. A cast-iron box with an open front (for direct heating from the open flame), this scientifically designed heater sat within, and slightly forward of, a conventional hearth. The flue gases escaped up the chimney, but not before they were routed through a set of baffles at the back of the box to maximize heat output from the burning wood.

☞ COAL FIREPLACES: Once coal supplies became common in this continent after 1830, new equipment appeared to burn

the hotter, more compact fuel effectively. Coal requires a smaller holder than wood—a fire basket or dog grate—and to be raised up for draft and ash deposits. These baskets were often incorporated into mantel inserts, some designed along the lines of a Franklin stove.

BALTIMORE HEATER: Marketed from the 1850s well into the 1930s, the legendary Baltimore Heater (also called the Latrobe stove, after the inventor) was the best known of several stoves-in-a-fireplace. Nearly self-feeding, it could burn for 14 hours on a single load of coal. They were supplied with round, square, or "French frames" to fit the the particular mantel opening and ripe with parts and accessories, such as anti-clinker grates, dust dampers, gas dampers, and water-evaporating tanks. Some models even had a top plate for pots and pans.

OUTFITS: Cast-iron liners were used to improve the heat output of a fireplace as early as 1785. By the turn of this century, a builder could order a complete firebox assembly from

> a mail-order supplier that incorporated burner and damper, eliminating the need for a skilled fireplace mason. Close in construction to a stove, the fire pit was typically lined with firebrick for burning wood, hard or soft coal, or coke. Other modelsmade in varying depths—were designed for natural or artificial gas. Outfits might include a summer front-a decorative plate that covered the gas burner or wood/coal basket in the nonheating season.

▼ VENTILATING GRATES: The concept of coaxing more heat from a fireplace did not die with Franklin in the early 10th century. By the 1800s, ventilating grates of one ilk or another were favorites for the up-to-date house, which might also be



Gas radiant elements of the 1920s often "burned" in a Neoclassical (top) or Adam style (above) coal basket.



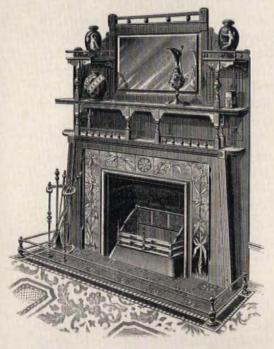
The Baltimore Heater mated with a mantel—less space than a stove, more efficient than a fireplace.



Special piping behind the Baltimore Heater reburned exhaust and ducted heat to upstairs bedrooms.

Mante Inserts GORDON

equipped with early central heating. The forebears of today's Heatilators and other fireplace inserts, these designs capitalized on convection by taking outdoor air, heating it through an air chamber at the back of the grate, then ducting it to one or more



Coal baskets and grates were a standard part of prefab metal fireplace outfits from the late 19th century into the 20th century.

rooms. One advertiser claimed it "will heat a residence with two-thirds the fuel required by a furnace." Grates were designed in all styles "especially in the Colonial."

GAS HEATERS: Well established as an illuminant by the 1850s, gas was not seriously tried for fireplace heaters until the late 1880s. Although cleaner and more controllable than coal or wood, it was considered an expensive way to heat.

After 1900, two events put the gas fireplace in a more favorable light-for a short while anyway. The winter of 1902 brought a bitter strike that drastically cut the supply of coal and sent homeowners looking for alternative heating fuels. Simultaneously, gas companies suddenly found that electricity was eating into their lighting market, so they courted new customers with novel gas-burning appliances among them, fireplace heaters.

These heaters operated on one of two basic principles. Reflector heaters burned the gas in open flames, typically radiating the heat with a silvered backing. Incandescent heaters trained the gas flame on an incombustible material that became white-hot and luminous. Simulated coal fires and some gas logs fall into this group. However, the most popular incandescent by the 1920s was the radiant heater. Here the fireproof material was a series of fire clay elements or a panel of asbestos fibers.

Popular and practical up to the Depression, the gas fireplace was a decorative sidekick to the main heating system good for additional heat on very cold days, or used alone just to take the chill off a cool morning.

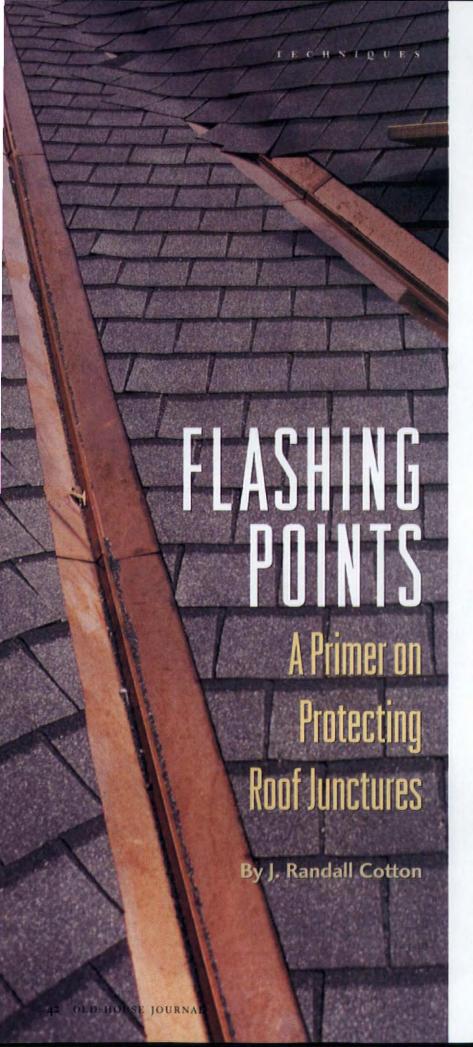


Naked flames supplied all the heat from this ca. 1900 gas log.





The Ventilating Grate insert, as advertised in the 1890s, warmed air along the back (top) and passed it through grilles in the front (above).



OOFS AND WALLS ARE MOST VULNERable to water at their joints. At valleys, hips, ridges, chimneys, dormers, and roof-to-wall connections, the job of diverting rainwater falls on flashing. These waterproof sheets, usually copper or aluminum, are integrated into the roof and serve to siphon water towards eaves and gutters.

Flashing's engineering is straightforward, yet it is one of the most overlooked elements of an old house. Many times, when roof problems arise, it's undermaintained flashing that's the weak link in an otherwise sound roofing system. Here are three steps to healthy flashing.

1. Maintenance

AN ANNUAL, OR EVEN SEMI-ANNUAL, Inspection of flashing (and roofing) is one of the most effective maintenance routines a homeowner can perform. Look for pitting and powdering metal surfaces, rust, tears and cracks, open joints, missing or deteriorating nails and cleats, and buckling.

ORGANIC GROWTH: Remove all debris, vegetation, and roofing refuse. Such buildup can dam rainwater, forcing it back up under roofing units. Scrub away green slime, lichen, and moss. They contain acids that corrode copper, zinc, or lead flashing. Also, with the flashing clean, wear and tear, corrosion, and imperfections are easier to spot.

PEELING PAINT: Terne flashing must be repainted regularly. Clean the surface and allow it to dry. Paint on a base coat of red iron-oxide/linseed oil paint, or other paint specifically made for terne metal. Use linseed oil paint for the topcoat.

2. Spot Repairs

IF YOUR INSPECTION TURNS UP EVIDENCE OF significant flashing injury or corrosion, or if you're getting interior leaks that you have traced to flashing, repairs are in order. If the flashing problems are localized, you may be able to solve problems with spot repairs.

cracks, Holes, AND TEARS: Flashing is particularly prone to metal fatigue at bends and to tears at nail holes. If possible, remove and replace the entire damaged

The best time to install flashing is during a complete roofing tear off and replacement.



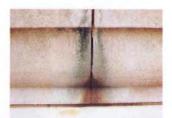
Flashing must be integrated into the roofing and compatible with adjacent materials.

flashing panel. Otherwise, cut out the defective section and replace it with a patch of the same metal. You can secure the patch to existing flashing with a lock seam (made with interlocking folds), a cold patch (a sealant- or flashing-cement-filled seam), or, the most secure, a lapped, pop-riveted, and soldered joint. Remember, you cannot solder aluminum.

BUCKLING: First identify the cause. Metal flashing often sticks to bituminous felt underlayment, leaving it unable to expand and contract. To remedy this, remove the whole flashing section and the felt. Add a heavy rosin-sized sheathing paper in between. Rosin paper allows the flashing metal to move freely. Clean and replace the flashing. Another common cause of buckling is improper fastening of the flashing to the roof surface. If the flashing is nailed directly to the wood sheathing, it can restrict the ability of the metal to expand and contract. (It also introduces holes in the material, which can lead to water penetration.) Install new flashing and fasten with cleats.

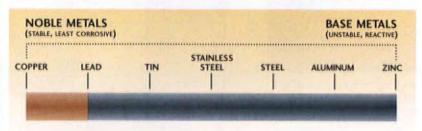
INCOMPATIBLE FLASHING: Flashing must be compatible with other rooftop elements. Some roofing materials cause flashing corrosion. Lime mortar can deteriorate aluminum, for example. Conversely, some flashing materials can harm surrounding building materials. Copper wash, green runoff, can stain masonry. If you find evidence of corrosion, check to see if the flashing metal matches the rest of your roofing.

DISSIMILAR METALS: You've also got to make sure the flashing metal is compatible with adjacent metal flashing, gutters, nails, etc. Each metal has a position on the electromotive series (see below), which ranks them from noble (stable and least corrosive) to base (unstable and reactive). The further apart two metals are in this series, the more potential there is for galvanic corrosion - an electric current between the two metals via an electrolyte, such as rainwater. In such cases, the metal that's more base will corrode. If you install copper flashing with aluminum gutters, for example, the aluminum will deteriorate.



Green stains on masonry are not always organic growth; they can also be the result of copper wash.





FASTENER DETERIORATION: Original nails and cleats may have rusted out or corroded from galvanic action. Remove all failing fasteners, and scrub away rust and residue. Replace with proper fasteners (see above).







FAR LEFT: Cleats provide anchors without penetration and give the metal freedom to move. MIDDLE: If you're replacing flashing on an existing roof, you'll need to remove adjacent roofing. LEFT: The bottom edge should be doubled under and formed into the gutter system.

Emergency Repairs

Roofing compound, also known as roofing cement or goop, has been notoriously misused to stop flashing leaks. It can become brittle and crack within a year, making the patch ineffective, while the homeowner assumes all is well. Then it is difficult to remove when it's time for another attempt at repairs. Don't use the stuff to patch flashing.



Roofing compound won't solve flashing problems, and it makes a mess.

If emergency repairs are necessary, make temporary patches with fiberglass mesh embedded in either fibrated latex-based roof coating or fibrated asphalt. The metal surface must be clean before patching.

3. Replacement

WIDESPREAD FLASHING DETERIORATION Requires replacement. This is best done when you're reroofing because flashing is installed under the roof material. So, whenever you're laying down a new roof, specify new flashing, or at least a professional inspection of the existing material. Sometimes, though, flashing must be replaced while the roof is intact. Here's how to replace valley flashing, the most likely flashing job on an old

house. Many of the methods used for valleys apply to other flashing projects.

PREP: Remove roofing to one shingle-width beyond the outer edges of the flashing. Hammer down any nail heads that are protruding from the roof deck, and fix any surface imperfections on sheathing boards. Lay down new asphalt-impregnated roofing felt and then rosin-sized building paper with the upper sheets overlapping the lower ones. Secure with fasteners that are compatible with the flash-

Flashing metals

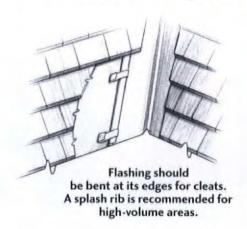
During the 19th century, lead, copper, terne (steel that's coated with a lead-and-tin mixture), and galvanized steel were used for roof flashing. Today, aluminum (exorbitantly expensive until this century), lead-coated copper, and terne-coated stainless steel (TCS) offer good alternatives. Here's a rundown of the choices, in approximate decreasing order of cost.

MATERIAL	MINIMUM RECOMMENDED THICKNESS	ADVANTAGES	DISADVANTAGES	PRECAUTIONS
LEAD-COATED COPPER	16 oz.	All the advantages of copper, with a coating that prevents copper staining, and slows corrosion and deterioration	Expensive	Deterioration of copper may actually accelerate if lead coating wears away in spots
(Ltep) = - zwinfisso zileef Ltejwe-cowien	.015 inch	Tough, long-lasting material; the advantages of stainless steel, plus coating that sacri- fices itself to severe pollution	Expensive; difficult to work	May be difficult to find distributors in some locations
STAINILESS STEEL	26 gauge	Chromium-nickel steel; corrosion resistant and durable	Expensive; difficult to work	In areas of severe chemical or industrial pollution, terne- coated stainless steel (TCS) may be advisable
COPPER	16 to 20 oz.	Most versatile flashing material; corrosion, impact, fatigue resistant; easy to work; green protective patina forms	Acid rain deteriorates; "copper wash" run-off may stain adjacent surfaces	Do-it-yourselfers should use "soft rolled" copper only; do not use with oak shingles
ZINC ALLOY	28 gauge	Corrosion and stain resistant; mostly used as galvanizing coat for other metals; forms protective patina	Brittle, weak; relatively limited life span	Contact with cedar shingles may cause staining; contact with lime mortar or acids in wet woods can cause corrosion
LEAD	2 ½ to 3 lb./sq.ft.	Easily worked, very dense, corrosion and stain resistant; forms protective patina	Because of weight and softness, tends to creep over time, may result in permanent wrinkles; tears easily; difficult to solder	Use copper cleats; use in smaller sheets to prevent creep; acid in oak shingles and lime mortar can cause deterioration
IGALVANIZED Steel	24 gauge	OK to use with asphalt shingles	Relatively short life span	Should be kept painted
TERNE	28 gauge	Steel- or iron-coated with tin/lead mix; relatively inexpensive; easy to work	Requires regular painting and cleaning to prevent corrosion	Must be kept painted, including underside
ALUMINUM	.027 inch	Corrosion resistant; easy to work; forms protective patina	Lacks strength; high coefficient of expansion; cannot be soldered	Avoid contact with lime mortar and cedar shingles

ing metal (see page 43), and sink them.

EXPOSURE: The exposure, the portion of the valley that's not covered with roofing, should be at least 4" wide (that is, 2" on either side of the roof joint), and the flashing should extend at least 5" under the shingles on either side, so the minimum width of the flashing is 14". For particularly long or steep slopes, increase the exposure by 1/8" per linear foot of flashing. This accommodates larger volumes of water lower on the roof.

FABRICATION: For long runs or steep pitches, you'll want to fabricate the bend with a 1" splash rib, in the shape of an inverted "V". This hinders fast-moving rainwater from splashing across the valley and up under the roofing on the opposite slope. Also, crimp over the flashing's edges about a 1/2" to accommodate cleats and to prevent wa-

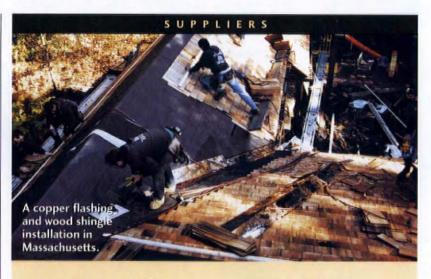


ter from seeping underneath. Crimp under the exposed bottom edges of flashing about a 1/2 to form a hem that stiffens the edge against high winds.

To form the sheet metal, you have several options. You can rent a bending brake; have a sheet-metal shop do the fabrication; or make your own brake: Place the metal with the bend line over the edge of a work table. Clamp it down with a 2x4 over it. Use a second 2x4 as a block to place against the flashing, and strike with a hammer (see "Restorer's Notebook," Sept./Oct. 1994).

INSTALLATION: Work from the bottom up. Each piece should overlap the one below by a minimum of 6"; these joints should not normally need solder or sealant.

FASTENERS: Do not nail valley flashing directly to the roof deck. (Nail holes are



FOLLANSBEE STEEL P.O. Box 610, Dept. OHI Follansbee, WV 26037 (800) 624-6906 Terne and TCS preformed ridge and valley flashing, and cleats.

CONKLIN METAL INDUSTRIES P.O. Box 1858, Dept. OHJ Atlanta, GA 30301 (404) 688-4510 Preformed valleys in galvanized, copper, terne, and TCS.

MIDLAND ENGINEERING P.O. Box 1019, Dept. OHJ South Bend, IN 46624 (219) 272-0200 Copper, lead-coated copper, terne, and TCS.

SCHNABEL'S ROOFING 1860 Pond Road, Dept. OHJ Ronkonkoma, NY 11779 (516) 585-7073 Metal flashing.

SWAN SECURE PRODUCTS 1701 Parkman Avenue Dept. OHI Baltimore, MD 21230 (410) 646-2800 Stainless-steel and other nonferrous nails.

SOUTH SIDE ROOFING 290 Hanley Industrial Court Dept. OH St. Louis, MO 63144 (314) 968-4800 Metal fabrication.

a source of water leaks.) Instead, use cleats so the metal can expand and contract without tearing or buckling.

Cleats are small strips, or tabs, of flashing metal about 1 1/2" wide by 3" long. Bend over one end of the cleat to fit under the outer-edge crimps of the flashing (see illustration). About 1" in from the other end, nail the cleat to the roof deck. The nails should go at least ¾" into the sheathing. Finally, bend the outer edge of the cleat over onto the nail head. Install cleats about every 18" on-center.

ROOFING: Reinstall roof shingles, overlapping the valley flashing on each side by about 5". Snap a chalk line along the valley for guidance on trimming. Cut the edges of asphalt shingles with a utility knife. For other roofing, cut each unit individually to achieve a neat, continuous edge.



Tow to Replace a Boiler

(Without Getting Steamed!)

WE HAVEN'T HAD DECENT HEAT SINCE THAT HEAT-ing contractor left our basement," the woman complained. She was about as angry as any old-house owner who had ever called me. "We paid good money for that new boiler," she continued, "but we still have uneven heat throughout the house. It sounds like the hammers of hell are pounding on the pipes, too, just as they did before. What do you think we should do?"

I could see her frustration, but I have to admit, my first thought was not about what she should do. I was thinking about what she should have done. You see, the best time to address the most common heating problems is when you're contracting major work-such as replacing the boiler - not after the job is finished. All it takes is a good checklist, some negotiating skills, and the willingness to shop for the best value rather than the lowest price. Here's some advice I'd give my best friend if she were shopping for a boiler.

Suppose you have a steam system . . .

IF YOUR STEAM BOILER LEAKS, OR IF YOU REALIZE THE OLD unit has the efficiency of a campfire, you're probably going to be shopping for a replacement and interviewing heating contractors to install it. (Only the bravest do-ityourselfer will tackle an old steam system.) As you negotiate

with your contractor make sure you do

these things:

■ Walk the contractor through your home and discuss your comfort concerns. If it's too hot in one room and too cold in another, let the contractor know. If there are gurgling or banging noises in the pipes or radiators, mention them and ask the contractor to suggest a remedy.

At this point, a good heating contractor will most likely lay out your options. Don't be surprised if those options add to the cost of the job. Ask the

contractor if the results will be guaranteed-a good one will not hesitate to stand behind the work.

If the Boiler Fits, Wear It

DON'T LET THE CONTRACTOR BASE THE SIZE OF YOUR new boiler on the size of your old boiler. The contractor must measure your radiators and analyze their

> ability to condense steam. Not doing so assumes that the original installer was infallible (a poor bet), and ignores the possibility that the house or system has changed during the past 60 or so years. Any contractor that says, "Well, the old one worked well for years so let's use the same size," is not paying attention to details and is not for you.

Also, don't let the contractor base the size of your new boiler on a heat-loss calculation of your home (see page 48). These cal-

culations mean a lot when you're sizing steam radiators, but they have absolutely no importance when it comes time to replace an old steam boiler.

Here's why. Steam is a gas that will eagerly condense on cold metal. The boiler must be able to make enough steam to reach the most distant radiator before all the steam turns to water. In other words, the boiler's ability to produce steam must match the system's ability to condense steam. If the boiler is too small, parts of your home will always be cold, and you'll burn lots of fuel. If the boiler is too large, the burner will short-cycle, run inefficiently, and the burner parts and controls will wear out long before their time. The contractor must take the time to survey and carefully measure your pipes and radiation—not the building. If he doesn't grasp the difference, he doesn't understand steam heating.

A Good Set of Pipes

THE PIPING AROUND A MODERN STEAM BOILER IS CRUCIAL to the production of "dry" steam (steam that contains no more than 2% water). If the steam is wet, it will condense before it reaches all of your radiators. You'll wind up with high fuel bills and uncomfortable rooms.

Heat-Loss Calculations

To do an accurate heat-loss calculation, the contractor must measure all the walls. windows, and doors. It takes an hour or more to size the typical house by the book. Nowadays, many progressive heating contractors use computerized heat-loss software that makes the job a snap. Whether it's done longhand or by computer, ask the contractor to include a copy of his heatloss calculation with the contract.



Heat-loss calculations will assess the kind, as well as number, of windows in an old house.

Nowadays, most reputable steam boiler manufacturers consider the piping immediately around the boiler to be a part of the boiler. They publish installation booklets showing the contractors how they must install their boilers. If a contractor doesn't follow the manufacturer's instructions, the boiler won't operate efficiently, and there's a good chance the manufacturer won't honor their warranty should you have a problem. So, you should insist on seeing the installation-and-operating manual beforehand.

Have the contractor show you the correct near-boiler piping for the unit. Moreover, include a clause in the contract that says the boiler will be installed in full accordance with those instructions. This alone will scare away heating contractors who don't know what they're doing when it comes to old steam systems. Good riddance to those guys!

Don't accept copper tubing for the boiler's supply piping. Copper expands and contracts much more than steel. Because steam piping can take some odd angles, the expansion of the copper often puts a lot of torque on the soldered joints. That twisting action frequently causes the joints to come undone after a few years. By then you're past warranty and on your own.

Proper steam piping calls for threaded steel pipe and fittings. The threads allow the steel pipe to twist without coming apart. Copper tubing is the province of the low bidder. If you're planning to stay a while



Correct sizing of a new steam boiler, such as this modern, gas-fired model, enables it to keep every room of the house comfortable on the coldest day of the year. Oversizing produces more heat than needed, making some rooms hot and wasting fuel.

in your old house, insist on properly installed, threaded steel pipe.

The steam pipes must be insulated to keep the steam from condensing before it reaches the radiators. In the old days, we used asbestos. Nowadays, we spend a lot of money removing the asbestos, and we rarely replace it. Most folks figure the heat isn't "lost" because it's still inside the house. Yet, if the steam is condensing in your basement pipes, it won't be condensing in your bed-

LOSSARY Common Heating System Components



AIR SEPARATOR: We use these on hot water heating systems to scrub air bubbles out of flowing water. There are several types available, and the more expensive ones work better than the cheaper ones. The air separator belongs on the main supply pipe where the water is hottest.

AIR VENT: These devices, located on steam radiators and mains, are replaceable and usually dome-shaped. Upon start-up, the air vent automatically allows air to escape from the system so that steam may enter. Modern air vents employ a float that allows them to close against steam and hot water, but remain open for



the passage of air. Air vents come in fixed or adjustable models.

AQUASTAT: This electrical control is present on every hot water boiler. Its job is to limit the water temperature to a preset high point. Some aquastats also keep the circulating pump from starting until the boiler reaches a minimum temperature.

AUTOMATIC WATER
FEEDER: This optional de-

room be l era

that this is c. can make in your o.

Clean Living

- REPUTABLE BOILER MANUFACTURERS INclude cleaning instructions in their installation-and-operating manuals. The contractor must follow these instructions if your new boiler is to make dry steam. It takes nearly a full day to properly clean an old steam system. There is no chemical or magic potion I know of that can make decades worth of dirt vanish. Don't accept shortcuts.
- Insist that the contractor install a drain valve in the boiler's mud leg-that drum

bottom of the boiler where sedher. Most contractors will in valve out to save a few ithout it, you won't have a sediment from your boiler as by. Dirty boilers have shorter than clean boilers.

Shop 'til You Boil

OU FIND IT DIFFICULT TO GET THREE competitive prices based on a specific d of boiler, change your shopping tac-Instead, let each contractor quote on equipment they think will best heat our home, but have each of them guarintee the results in writing.

You see, the various heating contractors you're talking to may buy their equipment from wholesalers who handle different brands of boilers. (Since the wholesaler extends credit to the contractor, the contractor will usually buy what the wholesaler stocks.) If you ask for Brand A, and the contractors' wholesalers stock Brands B or C or D, each contractor will try to sway you to the brand they're used to installing.

Rather than try to level this "playing field," have each contractor say, for instance, that when they're finished, your house will heat comfortably, evenly, and with no noise or squirting air vents. A good contractor will talk to you seriously about your system's problems, possibly suggest improvements that go beyond a simple boiler replacement, and will have no problem guaranteeing results.



Boiler:

This is the vessel that holds the water. Steam boilers and hot water boilers are very similar in appearance.

The main difference lies in the water content and the controls.

vice, which is widely used on steam boilers, will maintain a safe, minimum water line in the boiler. It's a back-up safety device for the lowwater cutoff. Don't think of the automatic water feeder as a convenience item-you still need to check your boiler's water line regularly.

BACKFLOW PREVENTER:

Used on hot water boilers, backflow preventers keep boiler water from flowing backwards into the public

water supply, should a water main break. In many states, backflow preventers are required by law.



BURNER: The burner is the device that makes the fire inside the boiler. Burners run on natural gas, propane, and

fuel oil. They need to be cleaned periodically and tuned using specialized instruments.

CIRCULATOR: Like the motor on a Ferris wheel, the circulator in hot water heat-



ing propels the water around and around the system.

COMPRESSION TANK:

Water expands when heated. Since a hot water heating system is closed to the atmosphere, we have to give that expanding water a place to go-typically, the compression tank. You'll almost always find a compression tank hanging around near the boiler. However, if you have an old gravity hot water system, [continued on page 50]



Modern high-efficiency boilers sometimes don't get along well with old chimneys (see "The Chimney Detective," page 34). For your safety and protection, make sure you ask every heating contractor who steps into your home about the potential for condensation in your chimney.

A final note on steam heating. Competent steam contractors generally charge more for a boiler replacement than others, but they'll deliver more in the form of increased comfort and substantial fuel savings. A contractor doesn't have to be 80 years old to be proficient at steam heating, just willing to do the proper homework and listen to your concerns about comfort in your old house.

Changing a hot water boiler?

HOT WATER HEATING SYSTEMS AREN'T AS touchy as steam systems, but when it comes time to replace that aging boiler, there are still plenty of things you need to watch. Here are a few:

For a hot water heating system, do insist that the contractor perform an accurate heat-loss calculation for your home.

> Hot water heating is very different from steam heating. The heat travels on the water

> > like a passenger on a train. It gets on in the boiler and off in the radiators. The water doesn't condense along the way as it does in a steam system; it stays liquid throughout the trip. The only

correct way to size a new hot water boiler is by measuring how much heat your old house will lose on the coldest day of the

year. We call this a heat-loss calculation.

Many contractors, though, are in a hurry. They'll size your new boiler using "rules of thumb" to size your new boiler conservative estimates designed to avoid problems for the contractor. The trouble is, these methods might leave you with a boiler that can heat your home with the windows and doors wide open. (Then you'll have to feed it!) Other contractors size boilers by the "label method." They check the existing boiler, then give you the same thing. This makes no sense because the old boiler was probably put to work before weather-stripped windows and effective insulation came along. Every structural improvement you've made to your old house affects its heat loss. Don't buy more boiler than you need.

As with steam, discuss comfort-related issues with the contractor before you give him the job. Here again, let him know if some rooms are too hot while others are too cold. If possible, base the contract on final system performance, rather than on the boiler replacement alone. Be prepared to invest more than the cost of the boiler, if necessary.

Keeping Things Fluid

■ UNLIKE STEAM, YOU DON'T NECESSARILY have to insulate hot water pipes, unless, of course, they run through areas where the circulating water might freeze. Remember, the heat rides the flow like a passenger on a train. If some heat gets off in the

OSSARY Common Heating System Components

[continued from page 49] look for a tank in the attic

> with an overflow pipe that runs out onto the roof. In the trade this is called an "expansion" tank, but it serves the same purpose as a compression tank.

Compression Tank

FEED VALVE: This is the valve that puts water in your hot water heating

OLD-HOUSE JOURNAL

system. Sometimes called a pressure-reducing valve (PRV), this valve's job is to lift water to the highest point in the system and to place that high point under a pressure of about 3 psi.

LOW-WATER CUTOFF: In the event the boiler loses water, the low-water cutoff kills the power to the burner before the situation can become dangerous. Should the boiler "dry fire," its sections may crack and the



Low-Water Cutoff

boiler may be permanently damaged.

RELAY: A relay is a sort of electrical traffic cop for a hot water heating system. It relays signals between the room thermostat, the circulator, the aquastat, and the burner, and gets all these important components working together.

TRIDICATOR GAUGE: You'll find this gauge on your hot water boiler. It shows you three things: the water temperature, the boiler pressure, and the height of the water in the system. A service contractor will use the tridicator gauge while troubleshooting your system.

basement, you'll still have heat moving to that far radiator up in your bedroom because hot water can't condense into anything other than what it already is—water.

If the contractor suggests you fill the pipes with antifreeze instead of water, make sure the antifreeze is designed specifically for hot water heating systems. Automobile antifreeze is not suitable because it can't take the extreme temperatures you'll find inside a boiler. If you go with antifreeze, remember you'll have to check it from year to year, and change it periodically. Old antifreeze becomes corrosive and will eat away the metal parts of your system.

When you have an old gravity hot water system, and the contractor is installing a new boiler with a circulating pump, make sure the job includes adding a flow-bypass line around your new boiler. This is very important because, without the bypass, the cold water entering the boiler can crack hot metal. It can also cause the flue gases to condense inside the boiler and munch on the metal. The boiler manufacturer specifies the piping arrangement for the bypass. Reputable heating contractors are very aware of this potential problem.

Discuss heat balance with the contractor as well. Old gravity hot water heating systems often do strange things when retrofitted with a circulator. Remember, ultimately you're interested in comfort. Base your contract on system performance and you'll be fine.

Automatic Improvements

hot water heating system needs one of these labor-saving components because air comes out of solution when you heat water. Without an air separator, the air winds up in your radiators, and you wind up bleeding them every few weeks during the winter.

I think every residential hot water boiler should have a low-water cutoff switch. All states call for this important safety device on steam boilers, but they haven't yet gotten around to making them law everywhere for small hot water boilers. (They are required on multifamily housing and commercial buildings.)

Should the water leave the boiler,



Many old houses are already on their second hot water boiler. (Conversions from coal to oil were common in the 1930s.) Though these units may still be performing acceptably after 30 to 50 years of service, today's gas- or oil-fired boilers are smaller and more efficient.

for whatever reason, a low-water cutoff will shut off the burner. An automatic water feed valve, which is a common component on residential hot water boilers, offers little or no protection against a low-water condition, and can actually add to the problem should the boiler or a pipe spring a leak.

Ask about cleaning before you sign on the dotted line. Like steam systems, hot water systems work much better when they're clean. Smart contractors know this and they'll flush a new system after installing the new boiler as a matter of course.

I've found that heating contractors pay the greatest attention to—and take the greatest care with—knowledgeable consumers. Moreover, the seeds of most problems get planted by bad communication. So take the time to discuss your comfort concerns with your contractor. Ask if the new product you're planning to buy—be it a boiler, a new radiator, or a lowly air vent—will solve your comfort problems. If the contractor assures you it will, there should be no problem basing the contract on the results.

Dan Holohan writes about older heating systems from his consulting firm. Dan Holohan Associates, Inc., 63 North Oakdale Avenue, Bethpage, N.Y. 11714; (516) 796-9276.

Suppliers

BURNHAM CORPORATION Hydronics Division P.O. Box 3079, Dept. OHJ Lancaster, PA 17604-3079 (717) 397-4701 Steam and hot water boilers.

ITT FLUID TECHNOLOGY CORPORATION 8200 N. Austin Ave. Dept. OHJ Morton Grove, IL 60053 (708) 966-3700 Circulators, compression tanks, automatic water feeders, low-water cutoffs.

LENNOX INTERNATIONAL, INC. P.O. Box 799900, Dept. OHJ Dallas, TX 75379-9900 (214) 497-5109 Steam and hot water boilers.

SPIROTHERM, INC. 25 N. Brandon Dr. Dept. OHJ Glendale Heights, IL 60139 (708) 307-2662 Air separators.

WATTS REGULATOR CO. 815 Chestnut St., Dept. OHJ North Andover, MA 01845-6098 (508) 688-1811 Backflow preventers.

References

THE HYDRONICS INSTITUTE, INC. P.O. Box 218, Dept. OHJ Berkeley Heights, NJ 07922 (908) 464-8200 Publications on heat-loss calculations, steam and hot water heating; contact for directory.

Keeping Time

BY MARLA KILEY

OU WANT A HOUSE IN DENVER WITH A turret!" I yelled. My husband, Kevin, was being unrealistic. We had decided to buy an old house, so we spent our weekends house hunting. I found many I liked, but Kevin wouldn't commit to any of them. When I asked him why, he confessed he was holding out for a house with a turret.

Where was I going to find a house with a turret?

In Colorado, Victorian homes are limited. Denver has only been around since 1858. I stewed inside as I flipped through the pages of homes for sale, looking for anything with a turret.

Just two short weeks later, I saw an ad and a photograph of a house with a round tower. The brick home, built in 1896, was covered with stucco during the 1920s and then converted into apartments. It was in desperate need of work. None of that mattered, however. It had a turret! The next day we made an offer that was accepted.

The style popular during the reign of Queen Victoria was the first influence the house experienced. The north tower has octagon-shaped rooms; an elaborately carved fireplace and decorative woodwork are notable features in the rest of the house. We soon discovered, however, that many other time periods were also represented.

Tempus Fugit

OUR FIRST MONTH IN THE HOUSE WENT FAST BECAUSE there was plenty to do. The house was suffocating under layers of multicolored paint, glow-in-the-dark formica, and orange-flowered wallpaper. Gray walls and dark brown paint were another reoccurring theme.

Our first order of business was to make the two apartments into one house again. Kevin, with the help of family and friends, tore down the wall that separated the upper level. With the beams exposed, the house's history became evident in the layers of decoration from different decades. But that wasn't all. Part of a staircase was also behind the wall. Apparently, it once curved into the foyer. Someone had removed the turned out section and continued the stairs straight down to an outside door for the upstairs renters.

The half-destroyed staircase made us realize how the house had changed with each generation. In 1896, the south part of Denver was just beginning to flour-

ish. Our house had been built less than 40 years after the first miners pitched their tents on the banks on the Cherry Creek and Platte River. Through the next one hundred years, the city grew from a frontier camp into a modern metropolis and the house had to change with the trends of the time.



As a break from the hard work of house restoration, Kevin and I usually like to go camping in the mountains.

Time Remembered

AS WE GOT FURTHER INTO THE renovation, the remnants of the past began to create a timeline. The house was a single-family home from 1896 until the Depression. In the 1930s,

the south door extension was built and the curved staircase was destroyed.

Our steeply pitched roof had a dormer, which housed a bathroom, built into the north side. We thought it was original. As we took down the badly damaged lath and plaster, we found mid-1940s newspapers used as insulation. After World War II, an upstairs bathroom had been added to give renters their own indoor plumbing. The work was so professional that it took baring the walls to discover how the dormer was joined to the roof.

While Kevin was reframing a doorway, he ran across a bundle of wax paper. The former owners of the home, the Taggarts, had left a time capsule for us. There was a letter from each member of the family and a copy of a newspaper dated October 18, 1965.

When the Taggarts had bought this house, the upstairs was used as an apartment. They were in the









As we converted the house back into a single-family dwelling, we discovered the stairs originally turned into the foyer.

process of converting the house back to a single-family home when they walled up the time capsule.

One of the Taggart boys had an active imagination. His letter told of a bank robbery in 1902, culminating in a shoot-out with the bandits in our basement. The money was never found, but he hinted it might be in our crawl space. Even that temptation could not get us to explore under the house.

Charles McDonald, the owner after the Taggarts, converted the house back to apartments and "updated" the interior with a 1970s motif. Although we blame him for pitching the clawfoot tubs, tearing off the gables, and painting the woodwork dark brown, we thank him for attending to the landscape. He planted a shady maple, a currant bush, and several aspen trees. What was once dry prairie land has matured into a lush landscape.

Times Change

ALTHOUGH THE '70S DECOR REmained, the house continued to change with each generation. We had first-hand experience with the 1980s culture through "Mike's friends," a parade of strangers who would knock on our door and ask for Mike.

Mike had lived downstairs before we purchased the house, but his endless stream of "friends" didn't know he'd moved. As new strangers continued to show up month after month, our suspicions grew. The mystery was solved when Kevin cleaned out the cold air returns. A large, dusty bag of marijuana was either hidden and forgotten or was lost down one of the vents. Mike's friends continue to come around, but now we understand why—the decade of drugs touched this house.

We thought our home would teach us a history lesson about the Victorian period. In fact, we learned as much about the 1920s through to the 1970s-something we didn't expect. We, too, have made a mark by recording the history of the house and adding it to the Taggart family time capsule. This treasure was sealed back into the door frame. Like those who came before us, someday we will move on, but the house will now be able to tell future residents a few stories about us and our times.

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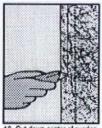
Apply second coat of saturant to wet mat.



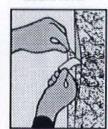
Apply 1st coat of saturant to adjacent area.



Apply mat to 2nd area overlapping by 1".



(both layers)







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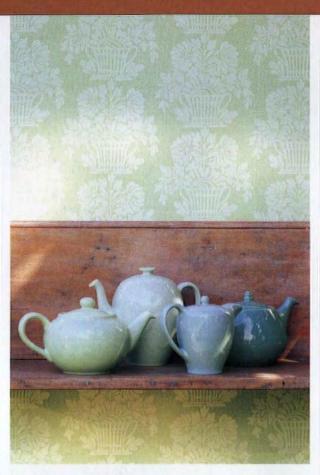


RESTORATIO

COPPER LINES

LOOKING FOR HAND-HAMmered copper hardware in not-so-standard sizes? Buffalo Studios, which produces a line of Arts & Crafts door and cabinet hardware, provides custom metal services. The copper metalwork patterns are based on originals by Gustav Stickley, Greene & Greene, and other early-20th-century designers. The studio also makes Dirk Van Erp and Limbert style table lamps with mica shades. A range of patinas are available. The hand-hammered copper cabinet pulls cost approximately \$65 each; prices vary for custom work. For a photo pack, send \$8 to Buffalo Studios, 1925 E. Deere Ave., Santa Ana, CA 92705; (714) 250-7333.





FLORAL PAPER

AN ABUNDANCE OF FLOWers adorns "French Basket," a new wallcovering in the Porcelaine collection from Richard E. Thibaut. The damasklike wallcovering comes in an antiqued green and is based on traditional European designs. The diverse Porcelaine collection also has wallpaper patterns ranging from a clean, blue-and-white graphic floral to a soft strawberry pattern. Coordinating fabrics and borders are available. The 20 ½" wallcoverings, which are prepasted and vinyl

A tisket, a tasket: The "French Basket" wallcovering is the perfect pick for any room in your house.

coated, cost \$24.99 per roll; the pattern number for "French Basket" is #839-T-67150. For local retailers, call Richard E. Thibaut, Inc., 480 Frelinghuysen Ave., Newark, NJ 07114; (800) 223-0704.

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FRUSTRATED WITH TRYing to remove hazy stains on your marble mantel? Try the five-piece Renaissance Marble Restoration Kit, which contains a solution to remove haze and oxidation marks. Instead of covering spots with a clear coat of gloss, the marble polish restores the stone by removing worn, faded lavers. (For high traffic areas, such as floors, you may need to lightly sand the surface first.) Then, the marble creme is applied and buffed with a soft cloth to protect the stone from the elements and further fading. Each kit, which costs \$19.95, contains the marble polish, marble creme, a cleaning cloth, a buffing cloth, and 400grit sandpaper. For more information, contact Renaissance Products, 6649 Amory Ct., #3, Winter Park, FL 32792; (407) 672-0850.

To get rid of faded spots on your marble, try the two-step Renaissance Marble Restoration Kit.



A&C CURTAINS

DRESS UP YOUR MISSIONstyle living room with Arts & Crafts curtains from Ann Wallace & Friends. The curtains are made of natural linen in various weights, as well as silk, cotton, or velvet. There are over 20 appliqué patterns with machine embroidery offered; custom designs based on a motif in your house are also available. For information, contact Ann Wal-



The "Sue Ellen's Lily" pattern appliquéd on these linen curtains is adapted from an Arts & Crafts design.

lace & Friends, Textiles for the Home, 767 Linwood Ave., St. Paul, MN 55105; (612) 228-9611.

PRETTY PENDANT

NEW METAL CRAFTS, A Chicago-based lighting company, specializes in antique, custom, and reproduction lighting. The suspended pendant fixture (#61229) is a repro-



Light up your dining room in 1920s style with this frosted glass pendant.

duction of the early electric styles from the 1900s to the 1920s. Suspended by ornamental rods, the frosted glass with clear beveled lines is illuminated by four lamps. The custom-made fix-ture measures 36" H by 22 ½" W and is available in polished or antique brass. For more information, contact New Metal Crafts, 812 N. Wells St., Chicago, IL 60610; (312) 787-6991.

SLATE TILES

of a slate floor but not the maintenance, check out Laufen's Chateau tiles for floors. The sealed surface of the tiles won't stain like slate does. The Chateau tiles have the texture and tone of slate and come in five colors—African Slate, Cumberland Green, Doric White, Jura Beige, and Multicolor. The 12" x 12" tiles cost \$2.50—\$3.50 per

Tile with a twist: The Cha-teau ceramic floor is made to look like slate. square foot. For information, contact Lau-fen International, P.O. Box 6600, Tulsa, OK 74156; (800) 758-TILE.

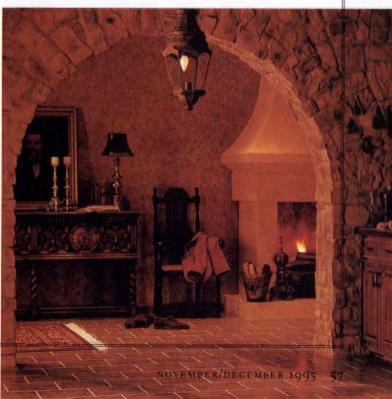
CRAFTSMAN ARTIST

ANITA MUNMAN CREATES original artwork based on the styles of noted early-20th-century artists, including graphic designer Dard Hunter of the Rovcrofters, potter Hannah Borger Overbeck, and woodblock artist Bertha Lum. The artwork features themes and motifs that were important during the Arts & Crafts period, such as the pictorial flatness and color intensity of Japanese prints. The pieces are framed in solid quartersawn oak with mortise-and-tenon joinery. Each painting is designed

by Ms. Munman and duplicated by artists according to her specifications. Prices range between



\$300-\$500. Contact Anita Munman Design, Inc., 729 S. Carpenter Ave., Oak Park, IL 60304; (708) 383-2884.



HOW TO ORDER OUR PLANS

ail-order plans have a long history in shaping the residential architecture of the country. Of the thousands of house plans available today, few exhibit good design and a grasp of historical proportion and detail. So, in response to requests from OHJ readers, the editors have "done the homework": We've hand-picked plans. In each issue, we offer the most attractive, authentic, and buildable of the historical designs, from all periods of American architectural history. Let us know what plans you're looking for.

You can order actual blueprints for all the houses featured. These plans are designed to conform to national building-code standards. However, the requirements of your site and local building codes mean you'll probably need the assistance of a professional designer (your builder may qualify) or an architect.

For the houses shown in this issue, blueprints include:

- · Detailed floor plans showing dimensions for framing. Some may also have detailed layouts and show the location of electrical and plumbing components.
- · Interior elevations are included in some plans, showing interior views of kitchen, bath, fireplace, builtins, and cabinet designs.
- · Building cross sections: comice, fireplace, and cabinet sections when needed to help your builder understand major interior details.
- · Framing diagrams that

show layouts of framing pieces and their locations for roof, first, and second floors.

- · Energy-saving specs, where noteworthy, are included, such as vapor barriers, insulated sheathing, caulking and foam-sealant areas, batt insulation, and attic exhaust ventilators.
- · May include foundation plan for basement or crawl space. (Crawl space plans can easily be adapted for full basements by your builder.)

Why order multiple sets? If you're serious about building, you'll need a set each for the general contractor, mort-

gage lender, electrician, plumber, heating/ventilating contractor, building permit department, other township use or interior designer, and one for yourself. Ordering the 8-set plan saves money and additional shipping charges.

Other notes: (1) Plans are copyrighted, and they are printed for you when you order. Therefore, they are not refundable.

If you would like information on ordering more than eight sets of the same plan, please call our Customer Service Department at (508) 281-8803.

- (2) Mirror-reverse plans are useful when the house would fit the site better "flopped." For this you need one set of mirror-reverse plans for the contractor; but because the reverse plans have backwards lettering and dimensions, all other sets should be ordered right-
- (3) Heating and air-conditioning layouts are not included. You need a local mechanical contractor to size and locate the proper unit for your specific conditions of climate and site.

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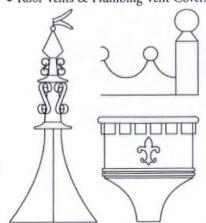


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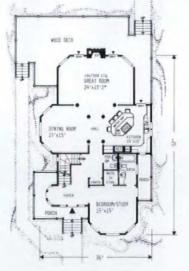
KING'S POST VICTORIAN



ING'S POST TRUSSES ADORN THE GABLES OF this grand, four-bedroom Victorian with wraparound porch. Inside, the impressive light-filled fover, complete with coat closet and powder room, leads to the family rooms. Classical columns visually separate the dining room and kitchen. Promoting efficiency, the kitchen cabinets are angled around the island workspace.

A vaulted ceiling, central fireplace, and dual deckaccess make the great room dramatic and versatile. The extra room, adjacent to a private porch, can be used as a guest bedroom or a study. Upstairs, each bedroom has a bay window. The master bedroom is luxurious with an enormous walk-in closet and capacious bath.

Plan AP-01-VI	
Cost	\$260
Set of 5	\$320
Set of 8	\$360
Bedrooms	4
Bathrooms	3 ½
Square Footage	2,600'
First Floor	
Second Floor	1,082'
Ceiling Height	
First Floor	9'
Second Floor	9'
Overall Dimensions	
Width	36'
Depth	60'



Second Floor

First Floor



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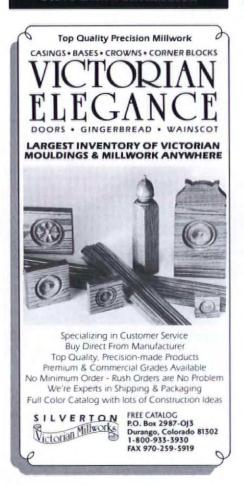


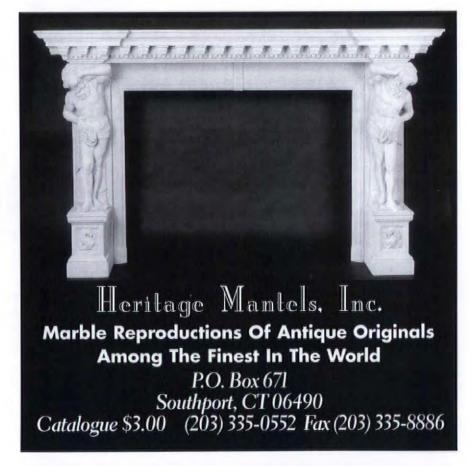
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Plan LC-04-GA Cost\$30 Square Footage......48', 64', 80' Ceiling Height (to the ridge)......9'2" **Overall Dimensions** Width......8' Depth......6', 8', 10'

GOTHIC REVIVAL GARDEN SHED

REAT FOR STORING GARDENING TOOLS, lawn furniture, or toys, this Gothic Revival garden shed has board-and-batten siding, decorative bargeboards, and a lancet-shaped door. For adding light, the plans provide dimensions for an optional diamond-shaped window. Patterns are included for making the bargeboard trim and pendants. All materials are standard and available at lumberyards or millwork houses. The shed may be constructed on either a concrete floor or a raised wood base in three sizes.

VICTORIAN GUEST HOUSE



Plan AP-02-GA	
Cost	\$50
Bedroom	1
Bathroom	1
Square Footage	1,476
First Floor	768
Second Floor	708
Ceiling Height	
First Floor	8'7"
Second Floor	8'1"
Overall Dimensions	
Width	32
Depth	4



Second Floor

ISH-SCALE SHINGLES, GABLED DORMERS, and an ornamented cupola add Victorian elegance to this guest house and twocar garage. Note the alcove laundry, an asset if the guest house is rented. The U-shaped kitchen opens into a cozy living room with bookcases and a desk. The spacious bedroom, next to the full bath, has ample closet space, plus a pull-down staircase for access to attic storage.

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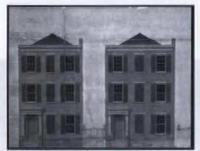
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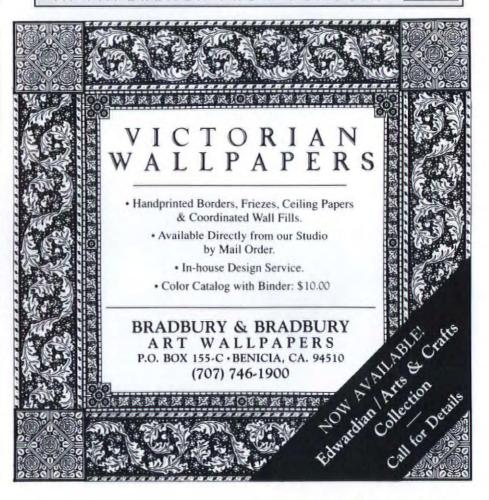
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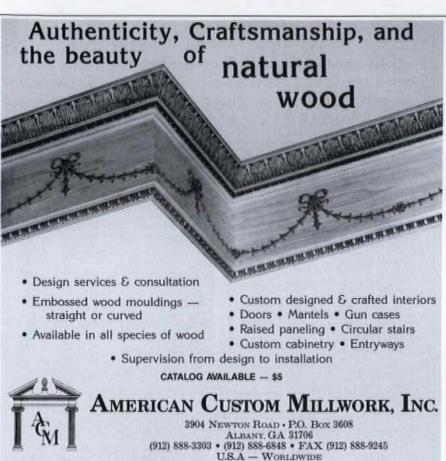
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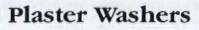
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Real Estate

MONROVIA, CA-1905 Queen Anne farmhouse. Completely restored & updated. 22 miles from Los Angeles in a historically minded "small town" community. 3 bdrms./3 baths, 2-car detached garage. 2,300 sq. ft. not including finished/livable bsmt. & attic. \$337,000. Owners, (818) 357-3235.

MILFORD, DE-150-year-old Victorian. 3 bdrm., 1 bath, 9' ceilings, hdwd. flrs., original plaster walls. Transom windows, pocket doors & a claw-footed tub. New furnace. Only 1/2 hr. from the Rehoboth Beach. 2 hrs. to either Phila. or Wash., DC. \$69,900. Call Mickey Mateo, (302) 422-2424.

DELAND, FL-1893 Tri-gabled El in historic district, 3 blocks from University. All original features, completely & sensitively restored. 4 bdrms., 2 baths, 2,437 sq. ft. Cypress siding, heart pine flrs., 10 ceilings, 4 frples. Beautiful wooded yard with cypress treehouse. \$155,000. James McLeod (904) 738-0493.

DAVENPORT, IA-1856 Greek Revival stone mansion completely restored for home/business or office; 4,000 sq. ft. National Register. Totally new electrical & plumbing systems, including 2 highefficient furnaces & a/c units. 2-1/2 hrs. west of Chicago. \$340,000. (319) 785-6715.

BLOOMINGTON, IL-Red brick Italianate mansion built in 1869, enlarged in 1900. Zoned for B&B. National Register. First 2 floors completely restored with 7 bdrms., 11 frples. One acre of land. \$289,900. Call Ivey Weaver, (309) 663-8571, Brady & Weaver, BH&G.

GALENA HOTEL AURORA, IL-1862 National Register Historic 40-rm. brick Federal style hotel in current operation. Ideal location in the heart of the downtown business district, in close proximity to the riverboat casino & riverwalk pedestrian amenity featuring entertainment, restaurants, & performing arts. The Fox River Trail, a 40-mile recreational facility along the scenic Fox River is just a block away. \$475,000. Contact Elinor Luse, (708) 897-1500.

GLEN ELLYN, IL - Queen Anne Victorian in historic area. Walk to excellent schools, shops, parks, & commuter train. Restored with authentic light fixtures, hardware, & woodwork; modernized with central air & gorgeous new kitchen. Spacious, flexible floor plan with 2 family rms. &/or library, four bdrms., 2 baths. Beautiful tree-lined yard & perennial gardens. \$379,000. Owner, (708) 790-0228.

WAUKEGAN, IL—ca. 1877, 5-6 bdrms., 3 baths, 2 master suites. Wonderful home &/or B&B (zoned for B&B). Near Lake Michigan harbor. Park with tennis courts, parking for 6+ cars, great neighborhood! 45 min. to Chicago or Milwaukee. \$298,000. (708) 244-5498.



VEVAY, IN-ca. 1874, an imposing example of Second Empire architecture with 23

rms., including 6-7 bdrms., 4 baths, & butler's pantry. Located on over 6 acres overlooking beautiful Vevay, IN along the Ohio River. Needs TLC to bring this Historic Landmark to its original elegance. One hr. to Cincinnati or Louisville. \$259,000. Riverscape Realty (812) 427-2478.

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kept historic neighborhood. Within 2 hrs. of Kansas City or Wichita. Owner, (316) 342-6881.

EASTON, MA'S OLDEST HOUSE-Josiah Keith House (1717), NR, in Cummings,

Wallace books; 7 ms.+, connected barn & original Corn Crib. 2.4 private acres abutting 600 acres of conservation land. Excellent schools, secluded setting yet easy commute via railroad to Boston/Providence. Museum-quality interior features include 5 frplcs., wide pine paneling, corner cupboards. \$199,000. Call owner, (508) 238-4053.

WAREHAM, MA-ca. 1710 historic family home with additions totaling 16 rms., 34 acres, lg. house barn with loft, caretaker's house (3 bdrms.), & outbuildings, including 2-car garage & workshop. Includes mature woods, meadows, blueberry crop, stone fences seclusion. \$795,000. Write: James Rufus Lincoln, Jr., 10941 S. Deer Creek Rd., Littleton, CO 80127, or call (303) 697-8780.

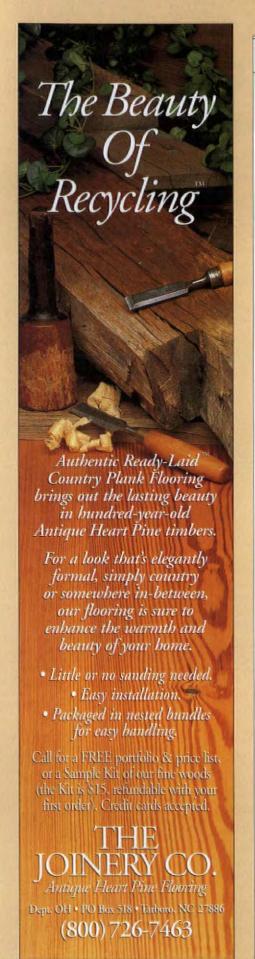
ASHEVILLE, NC-5,700 sq. ft. house in private historically compatible area of Grove Park Inn. Three dozen windows overlook GPI golf course, sunset, & mountains, ca. 1915-restored but historical integrity preserved. Cedar shake ext., slater roof, massive stone walls & garage, lovely garden areas. 7 baths (2 in master suite), closets galore, & lg. storage areas. 2 great apts. with kitchens & private entrance, \$520,000. (704) 253-5509.

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Real Estate (continued)



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CARMEL, NY-1860 Gothic Revival stone house. 4 bdrms, 2-1/2 baths, 5 marble frplcs., new slate roof, 350' veranda, restoration 90 complete, 4-3/4 acres, stone walls, huge trees, 70 min. to Manhattan. \$695,000. (310) 458-7322.

NAPLES, NY-ca. 1900, Colonial, 1,700 sq. ft., 3 bdrms., 2 full baths on 2 wooded acres overlooking Canandaigua Completely remodeled including 5 skylights & lg. country kitchen with vaulted ceiling. Stone frplc., bargain at \$85,900. (716) 374-5376.

NICHOLS, NY-1890s Victorian. Meticulously restored inside & out. 9 rms., 1-1/2 baths. Original/natural woodwork. New baths, custom butternut kitchen, + much more. On lg. lot in quaint upstate village along Rte. 17, convenient to everywhere, \$85,500. (607) 699-3546.



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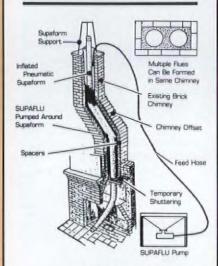
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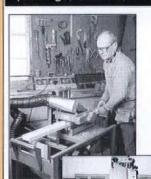
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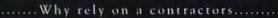
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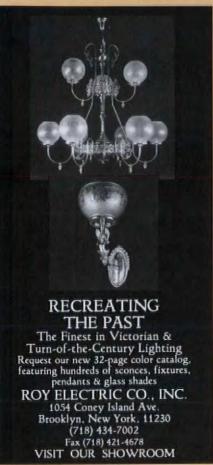
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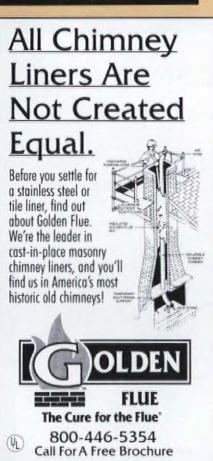
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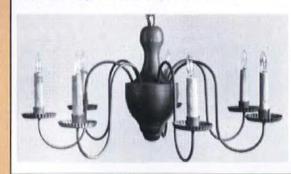
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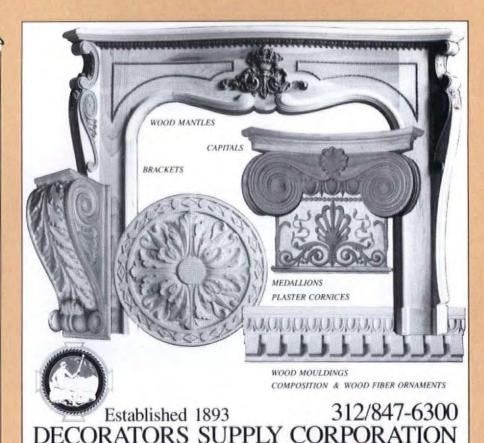
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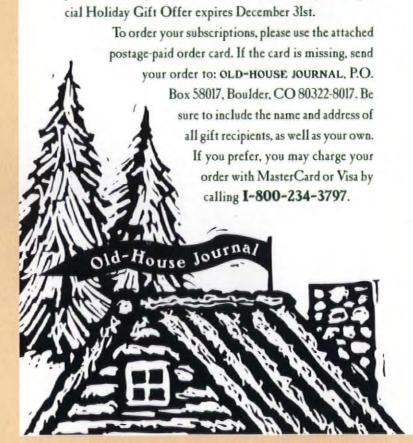
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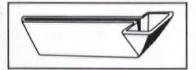


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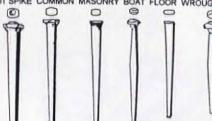
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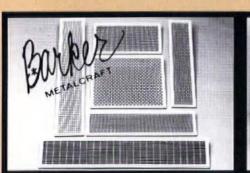
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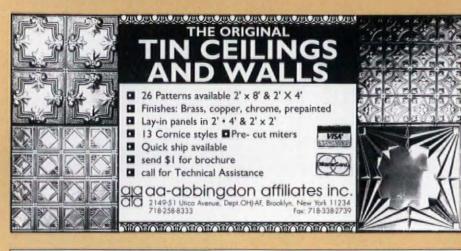
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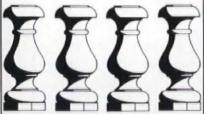
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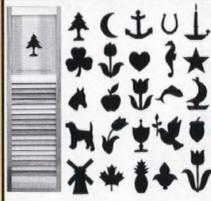


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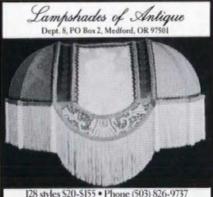


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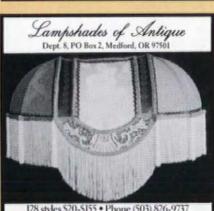


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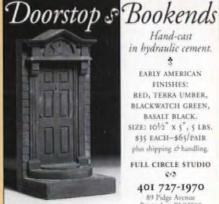
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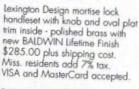
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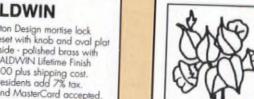
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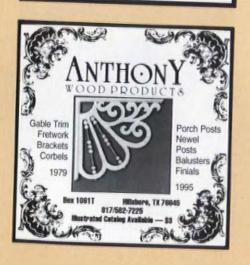
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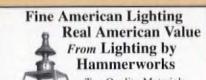
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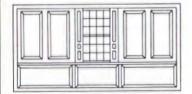
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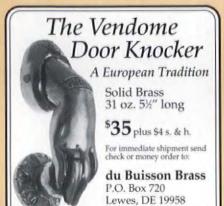
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Advertisers' Index

PAGE NO.

PRODUCT NETWORK NO.

PROI	DUCT NETWORK NO. PAGE NO
20	AA Abbingdon Affiliates
31	Abatron, Inc
51	Addkison Hardware Co., Inc84
23	Ahren's Chimney Technique79
517	Albany Woodworks69
805	Allied Windows15
651	American Custom Millwork, Inc64
599	American Home Supply13
6m	American International Tool Industries78
841	American Tool
49	Antique Hardware Store
652	Architectural Timber & Millwork79
353	ARSCO Manufacturing82
340	Arvid's Historic Woods55
593	Atlantic Recycled Paper78
18	Ball & Ball64
750	Barker Metaleraft77
73	Bendheim Glass76
27	Bradbury & Bradbury
	Carlisle Restoration Lumber26
91 312	Certified Chimney Contractors, Inc
242	Chadsworth, Inc
35	Charles Street Supply
47	Chelsea Decorative Metal77
47	Chubb Group of Insurance Co5
694	CinderWhit & Company77
26	Classic Accents71
	Colonial Cupolas85
733	Commercial Gutter Systems78
42	Country Curtains86
603	Country Designs
307	Craftsman Lumber
212	Crawford's Old House Store
397	Crown City Hardware27, 61
679	Crown Point Cabinetry21, 59
44	Cumberland Woodcraft80
518	Custom Wood Turnings82
	Dan Holohan26
245	Decorator's Supply71
8	Designs In Tile
101	Devence Louver Products
595	du Bussion Brass 86
	Ed Donaldson85
	Edward Hamilton85
55	Erie Landmark
32	Eugenia's Place84
221	The Fan Man9
294	Fischer & Jirouch15
	Full Circle Studio82
560	Gates Moore Lighting71
792	Golden Flue
806	Granville Manufacturing
387	Grate Vents
	Griffis Lumber84
843	H.L. Forbes69
812	Hardware Bath & More21
302	Hardware Plus89
-	Hazelmere Mantel85
689	Heatway Systems21
617	Hennessy House
	Heritage Brass Company
839	Heritage Mantels Inc
565	Hydro-Sil Heat Company
414	The Iron Shop67
545 631	J.L. Powell & Company, Inc17, 82
2	Joinery Company66
	Kayne & Son Forged Hardware82
334	King's Chandelier Company23

789	L' Esperance Tile
1-1	Lampshades of Antique82
672	Lehman Hardware77
0/2	Lighting by Hammerworks86
0	
842	Liz's Antiques86
620	M. L. Condon67
110	Mac The Antique Plumber6
540	Maple Grove Restorations86
	McFeely's68
16	Midwest Architectural Wood Products71
807	Miracle Method of New England, Inc77
	Monarch Radiators84
113	National Supaflu Products68
5	Nixalite of America23
527	North Fields Restoration23
5-1	Old Fashioned Milk Paint Co84
32	Old Wagon Factory22
702	Patina Finishes & Copper63
	Pennsylvania Plinth Company85
	Penquin Books63
753	Petit Industries, Inc77
	Pioneer Millworks85
726	Preservation Products79
728	Primrose Distributing17
758	Princeton Plans Press23
38	ProTech Systems, Inc22
	Reggio Register Company
659	
10	Rejuvenation Lamp & Fixt Inside front cover
538	Renovator's Supply11
752	Rinnai America Corporation67
11	Roy Electric Company 70
365	Rutland Products67
1	Schwerd Manufacturing4
	Shutter Depot84
	Shuttercraft82
840	Silverton Victorian Millworks61
	Sky Lodge Farm80
30	Smith-Cornell
788	Snelling's Thermo-Vac76
	Specification Chemicals55
675	
687	Steptoe & Wife54
122	Stewart Iron Works Company80
645	Strassen Plating79
748	Street Level Supply76
	Sun House Tile84
	Touchstone Woodworks85
551	Tremont Nail Company76
22	Uncle John's Gingerbread House82
	Van Dyke's
	Victorian Cottages
4	Victorian Lighting Works27
13	Vintage Wood Works55
401	Vixen Hill22
730	Vulcan Supply Corporation59
128	W.F. Norman Corporation69, 71
438	Ward Clapboard Mill27
439	Williams & Hussey69
	TheWood Factory76
	Woodhouse84
	Woodstock Soapstone Company59
194	Woodstone Company9
194	Woodwright Design80
722	Yield House
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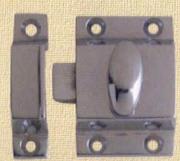
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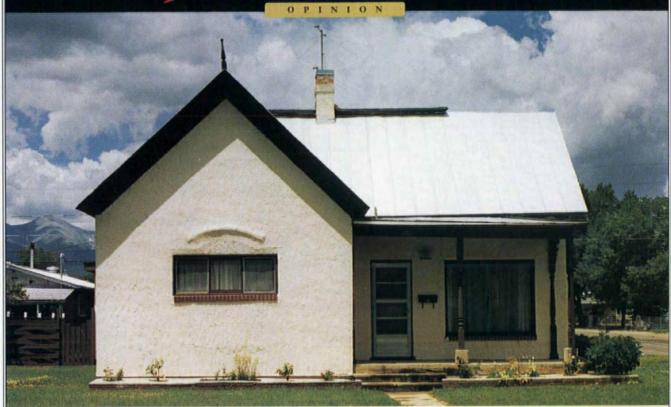
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T DOESN'T TAKE MUCH REMUDDLING TO MAKE A BIG IMPACT on a small building. Altering windows—the "eyes" of a house—hits especially hard when they make up most of the wall. Witness, for example, these modest Folk Victorian cottages in Salida, Colorado.

The pink brick house (RIGHT) stands as a near-classic version of the gable-front-and-wing plan that took root in the West after the railroad arrived. Just one storey and sparsely decorated—there's nothing beyond some turned woodwork in the door, porch posts, and gable eave—the house leans heavily on the original brick and windows for its character, especially the pair in the gable end. They visually balance the door and window in the wing, and form the "face" of the house—complete with brick-arch "brows."



In the house above, the door and windows have equal proportions and rhythm. Fooling with the fenestration (top) radically changes the façade of the building.

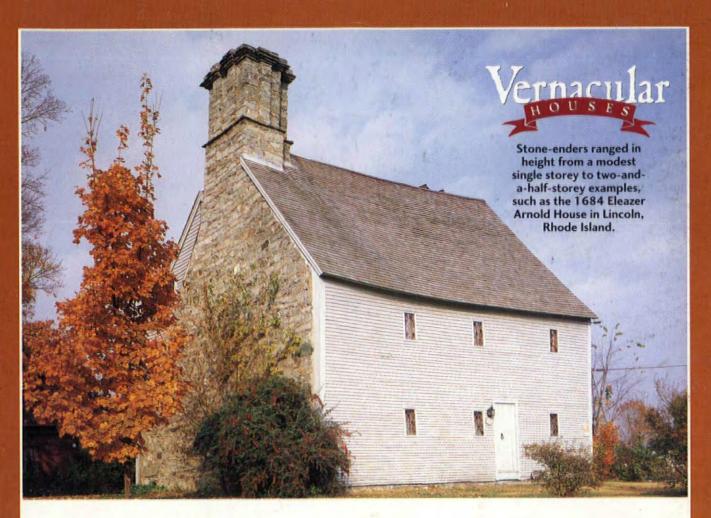
Not so lucky is the house across the street (ABOVE). OHJ reader Cindy Stava-Elfers describes how she was researching her family history when she snapped this case of "1960s pseudo-Spanish invading a Vic-

torian neighborhood." Sure enough, the textured stucco cladding is an unlikely match for a 19th-century façade, and the picture window in the wing has little in common with the gable end's cyclopean port. Adds Cindy, "Who would have ever guessed that these almost-twin houses would end up looking a picture of a

win Fame and \$50. If you spot a classic example of remuddling, send us clear color slides. We'll award you \$50 if your photos are selected. The message is more dramatic if you send along a picture of a similar unremuddled building. (Original photography only, please; no clippings.) Remuddling Editor, Old-House Journal, 2 Main Street, Gloucester, MA 01930.

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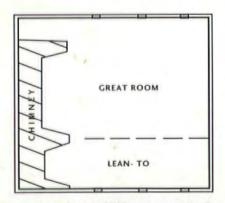




RHODE ISLAND STONE-ENDER

New England house that happens to have a massive stone chimney at one gable end? Why, a "stone-ender" of course. Built during the 17th and early 18th centuries, these houses are scattered throughout southeastern New England.

Good lime helps explain the generous stonework of the stone-ender. Large mineral limestone deposits were discovered in Rhode Island in the 1660s, permitting exposed masonry construction on a greater scale than in other areas of New England. Typically, settlers in these coastal areas had only the large shell middens (shucked oysters and clams left by Native Americans) to mine for lime-



Although the Arnold House was originally built with a lean-to, stone-enders often started out with a simple one-room plan.

making raw material.

Aside from their massive stone chimneys, stone-enders were built of wood and varied little from houses erected in neighboring colonies. The stone-end form is believed to have its source in Wales and northwest England, where there are many examples from the 16th and 17th centuries. A number of the Rhode Island colony's early settlers came from these areas.

Today, there are only about a dozen true stone-enders—that is, with end chimneys intact—in Rhode Island, eastern Connecticut, and southern Massachusetts. Other 17th-century buildings, originally built with a stone-end chimney, have been updated with smaller brick chimneys, altered by additions, or otherwise transformed over two centuries.

— MYRON O. STACHIW Director Research, Interpretation & Education Society for the Preservation of New England Antiquities





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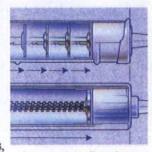


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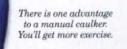
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T A B L E O F

VOL. XXIII, NO. 5

SEPTEMBER/OCTOBER 1995

8 EDITOR'S PAGE

A Spec-Tacular Issue for biggerthan-average projects.

10 MAILBOX

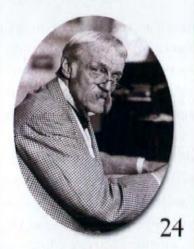
Recreating a porch, sleeping in the sleeping porch, questions about the "Old Way of Seeing," and when to rewire.

16 ASK OHJ

Wood gutters for turrets, late-19thcentury pressed brick, and interlocking T-shingle sources.

20 RESTORER'S NOTEBOOK

Making a wallboard skate, freezing linoleum for removal, a better flat prybar, and more water heater maintenance.



24 WHO THEY WERE

Frank Furness, the architect who raised Victorian eyebrows with his bold, complex designs, led an eccentric life.

BY JAMES C. MASSEY

ON THE COVER: Three storeys up, M. J. May Building Restoration adds finishing touches to the extensive porch and paint restoration of this ca. 1900 Queen Anne farmhouse in Tichigan, Wisconsin. Special thanks to owner Andy Apple and contractor Michael May.

COVER PHOTOGRAPH BY STEVE MARSEL

30 STELE

Identifying Mail-Order & Catalog Houses
If your house was built between the 1840s and

If your house was built between the 1840s and World War II it could have come from mail-order

plans or even from a precut kit. Here's how to find out.

BY DANIEL D. REIFF



38 HOW-TO

Award-Winning Medallions

An ornamental plasterer's specifications for making plaster ceiling medallions, from spinning a run surround to casting enrichments.

BY DAVID FLAHARTY





44 TECHNIQUES Craftsman

of Steel

When structural faults threatened Gustav Stickley's Craftsman Farms, the museum added hidden steel reinforcement.

BY NANCY STRATHEARN

50 KNOW-HOW

Picturesque Slate

The rustic slate of early-20th-century houses looks old and perhaps poorly designed — and that's just how the builders wanted it. Maintaining the textured slate roofs of the early 20th century takes an understanding of their techniques.

BY J. RANDALL COTTON



CONTENTS

ESTABLISHED 1973

64 RESTORATION PRODUCTS An expanded guide to n tools that make old-hou

An expanded guide to new power tools that make old-house restoration work easier, plus some decorative products for old houses.
BY JOSH GARSKOF & GORDON BOCK



70 HISTORIC HOUSE PLANS

A Heartland Starter Home and a Pattern Book Victorian

77 EMPORIUM

Catalogs, Products & Services, For Sale/Swap, Real Estate, and Events

CLASSIFIEDS 77
RESTORATION SERVICES 86
PRODUCTS NETWORK 92
ADVERTISERS' INDEX 110

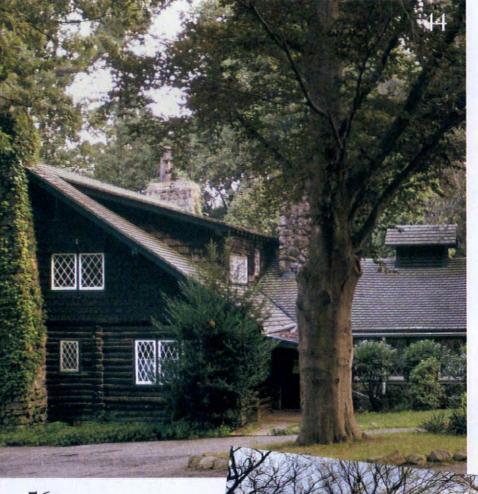
114 REMUDDLING

Virtual Unmuddling

116 VERNACULAR HOUSES

Sandstone Houses of Potsdam, New York BY SUSAN OMOHUNDRO





56 STEWARDSHIP Construction Management —

An OHI Report

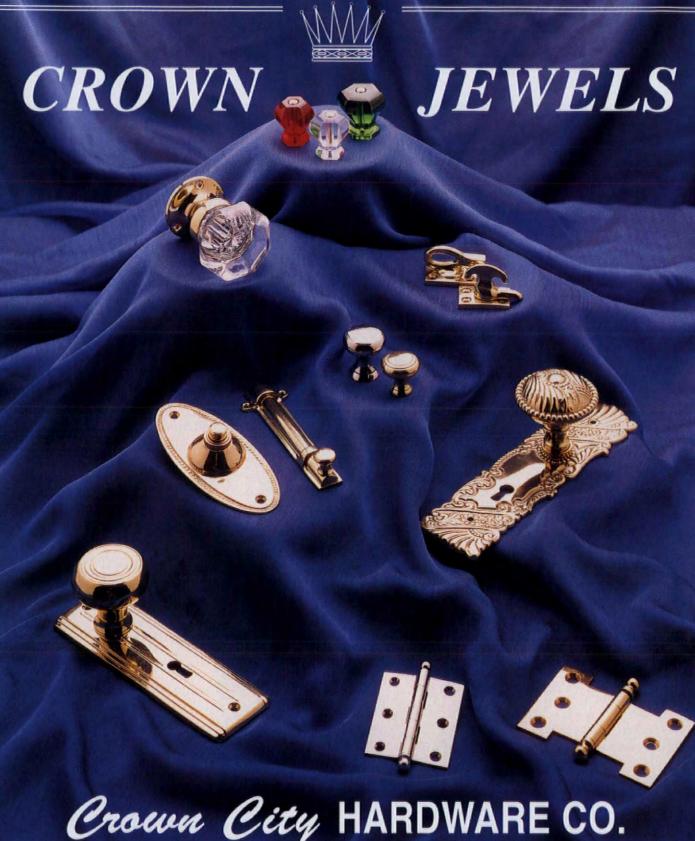
These consultants orchestrate old-house projects while the homeowners act as their own general contractors. Is this arrangement right for you? BY JOSH GARSKOF

60 SHOP TOUR

The Striking Facts About Cut Nails

Cut nails — the early mass-produced fasteners that dominated 19th-century carpentry — are still practical for specialized nailing and can help date old houses.

BY GORDON BOCK



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A Spec-tacular Issue

T'S AN UNFORGIVABLE PUN, PERHAPS, BUT A GOOD description of the articles between these covers. For this bumper-size OHJ, we decided to focus on some bigger-than-average projects and explore the techniques, specifications, and interplay of craftspeople, designers, and overseers that come together in complex restorations. Here's what I mean:

More than just methods for decorative plasterwork, "Award-Winning Medallions" is about custom, large-scale ornament, artisanry, and a project that goes be-

yond off-the-shelf. It's also about the conditions and decisions you'll face if you want to create such a centerpiece in your old house. David Flaharty's skills first graced the pages of OHJ in our black-and-white newsletter days, and it's great to have him back — this time in living color.

Exactly one year ago, OHJ's cover came from one of the most romantic houses built in the early years of the this century — Gustav Stickley's log cabin home, Craftsman Farms. This September/October we get a look at the structural work that

was actually underway when the photo was taken. Adding steel to a historic building is an extraordinary measure — in some respects like remedial surgery. It takes engineering to make the metal mesh with the existing building, not to forget planning. (You can't dash down to the lumberyard on a Saturday morning and drive away with a wide-flange steel beam — at least not in my neighborhood!) "Craftsman of Steel" takes us through the ins and outs — quite literally — of this remarkable case history.

In "Picturesque Slate," Randy Cotton returns for another informative look at architectural effects of the post-Victorian era. Those haphazard-looking slates atop so many English and French-revival houses of the 1920s are actually two different styles, both very premeditated. Far from as simple as they appear, Randy explains the schemes behind each, and how to keep them looking . . . well, unkempt.

The "Construction Management" article started with a question: Who is this new creature we hear of on old-house job sites, the construction manager? A seeming chameleon — sometimes a contractor, sometimes a supervisor; the owner's liaison, yet an independent — this individual turns out to be not so new, but well worth considering. We all need help at one time or another,

and when there's a call for specialized expertise or equipment — or simply more bodies to complete the job — Josh investigates how the construction manager role can be a creative approach for dealing with typically old-house situations.

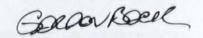
Yet this issue is not all large-scale reading. We take time out to have a little fun, too. As OHJ readers well know, stock house designs and materials have been used in North American housebuilding for 150 years. If you think your old house falls into one of the author's four groups, "Identifying

Mail-Order and Catalog Houses" will show you simple ways to confirm (almost) it's pre-fab provenance.

In "Who They Were," Jim Massey introduces us to his favorite Philadelphian. It's taken most of this century to change the notion that Frank Furness's buildings are extroverted and ugly, but perhaps that's because he was among the most innovative and individualistic designers of the Victorian era. Last, putting together "Cut Nails" gave me an opportunity to learn how a historical building material is made and how it is used, as well as indulge my a personal weakness for antique machinery. It all looks pretty spectacular to me.



Not every old-house project is best done by one or two owner-restorers working in their spare hours. Big jobs, in particular, take added skills and extra hands.





OLD-HOUSE

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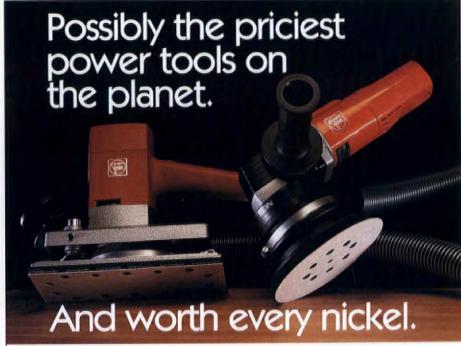
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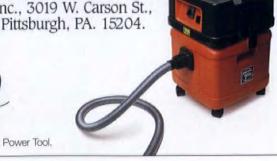
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M A I L B O X



REPLACING PORCHES

Dear OHJ,

I WAS DELIGHTED TO SEE THE PHOTO of our house pictured in your fascinating article ("Porch Missing? Altered? Answers to Reader Questions," July/Aug. 1995). At the time the issue appeared at our door, we were still in a quandary over what to do about our porches.

I had spread the word to everyone in town that I was looking for an old picture that might show how the porches once looked. I had all but given up on ever seeing a photo, when a friend of a friend produced this picture, taken of her great-grandfather on the porch in the late 1890s (about 10 years after it was built). I have gone from having a simplelooking doll house to a wedding cake. I sure hope we can do justice to this little project of ours.

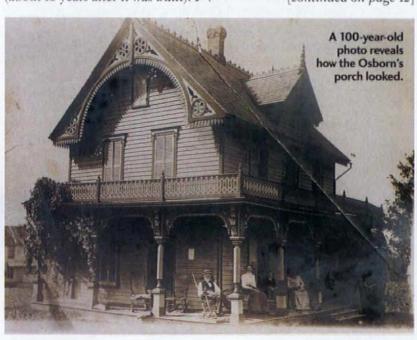
> — SANDRA S. OSBORN Chautaugua, New York

YOUR ARTICLE ABOUT MISSING porches was extremely interesting to us in light of our own experience. In the 1940s, the owner of our 1888 Queen Anne removed most of the original porch. Fortunately, we got lucky. Our neighbor had a photo that showed how the original looked and we were able to reproduce it authentically. Thank you for your fine article.

— RICHARD & SHARON SCHMIDT Merrill, Wis.

SLEEPING PORCHES

I SO ENJOYED "SLEEPING PORCHES" (July/Aug. 1995). My 1905 Four-square has two. Judging by the interior mouldings, both are additions. But they are early ones: the horizontal beaded lap siding continues under the window frames. After [continued on page 12]



ANOTHER VIEW OF "THE OLD WAY OF SEEING"

IF ONE IS TO JUSTIFY REGULATING lines in old houses ("The Old Way of Seeing . . . Additions," May/June 1995), they must be drawn through points and elements which are objectively apparent, and there must be a statistical standard of accuracy. Otherwise, one can find regulating lines everywhere.

If you look at the Jonathan Stone House, page 39 in the May/June issue, the only diagonal approximately in the golden mean relationship is the one between identical corners of the two groups of windows on either side of the door.

This is a legitimate and striking relationship among identical elements which clearly contrast on the façade. There is no guesswork in drawing the lines. The designer might well have used this proportion consciously in this case. Absent documentation, we can't be sure.

Most of the other lines drawn on the picture are misleading or inaccurate. For example, the line connecting the upper left corners of two windows emphatically does not land at the center of the doorsill, as anyone can demonstrate with a ruler, and the lines passing over the doorway arch are not parallel with anything else.

One can objectively tell that the Stone House diagonals are not parallel to the larger diagonals just described, although they are close to a golden section. In the house on page 41, it is impossible to choose which of several diagonals — such as those outside the frame, outside the ears of the sills, the edges of the glazing, the edges of the sash — naturally "belong" to the window.

Unlike the overall window grouping, in which we can measure [continued on page 12]

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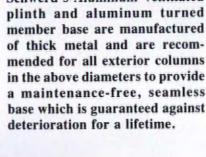
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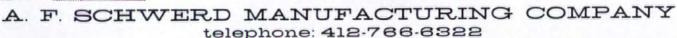
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MAILBOX

[continued from page 10]

like elements, we are now in the game of selecting the relationship we measure, which adds to the difficulty of proving intentionality.

The radiating lines shown on a few diagrams really have no justification at all, except in the general sense that radiating lines point all

over the place. The diagonals drawn on the Stone House are not even close to the actual radials of the fanlight. The author is really

reaching here.

The detailed elements of a house are far too complex and interrelated for the designer to rely on a simple and rigid proportion system. It is impossible to hold proportions among bricks, muntins, casings, and mouldings because they are not in a modular relationship to each other.

Proportions are useful to help the designer decide between two almost equally good layouts, and sometimes to guide larger relationships, as in the plan of a room or the overall proportion of a façade. Designers use them on occasion when it is convenient, and freely abandon them when it isn't.

Façades should indeed be subjected to rational analysis, but this can't be done simplistically with a bunch of lines. We need thoughtful analysis, not mystical guesswork. The burden of proof is heavy and is definitely on the analyst.

GORDON F. TULLY
 Arlington, Mass.

The Author Responds: In my book, The Old Way of Seeing, I show a picture of a maple

leaf, and on it I draw lines con-

necting its outer points to make a pentagram, a five-pointed star. The pattern is not exact, but this does not mean the diagram is arbitrary. Like the leaf, and like most old houses,

> the Jonathan Stone House is imperfect. But this does not mean it has no pattern; all but two of the regulating lines that form a lattice on the façade are

within 98 percent of one another's

average slope.

The radiating lines do not "point all over the place"; they point to the center of the fanlight over the main door, as I say on page 39. The spokes of the fanlight do not match the pattern. A 1973 photo shows the fanlight boarded up; the house has since been renovated and added to, so the present fanlight may not be original. A pattern does not evaporate because a badly designed detail, old or new, fails to follow it.

I do not say that the Jonathan Stone House is designed according to the golden section. I say that its proportions are based on the square root of 2 (within 95.5 percent, on average).

I do not say a designer should rely on a rigid proportion system, I say the opposite: "In designing a new building or addition I don't form a rigid grid and manipulate every element of the new design into it."

In 1775 builders learned routinely the geometry of form, and they also had the use of pattern books that were based on classical principles. The underlying pattern of a house designed and built in the old way is no more mythical, or mystical, and no less beautiful, than that of a maple leaf.

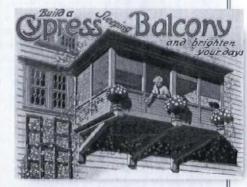
- Jonathan Hale Watertown, Mass.

[continued from page 10] reading your article, I figure that they must have been added in the teens or twenties. It is very interesting to see how companies marketed the add-ons back then.

— CATHERINE FRYER CLINE Jacksonville, Fla.

THANK YOU FOR A GREAT ARTICLE about sleeping porches. The first few years that we lived in our 1910 home, we liked the sunny little rooms off our bedrooms. We thought they'd make nice sitting rooms or offices, but they were too hot for summertime afternoons. Finally, we moved our beds out onto the porches. At night, they're the coolest spots in the house. It's great to sleep in the evening breezes and to wake up in the morning sun. Like using the right tool for the right job, use your sleeping porches for sleeping.

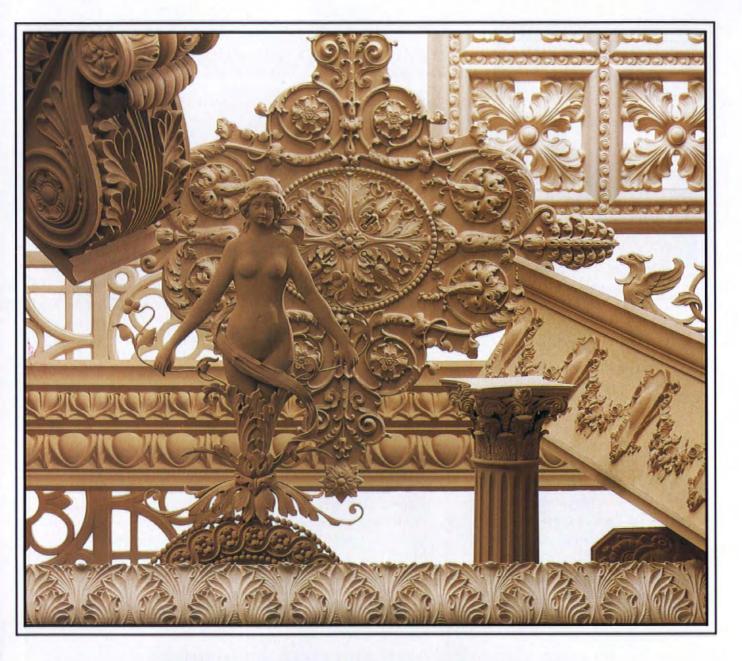
> Joe Wolfenden Sacramento, Calif.



Advertisements throughout the first decades of this century offered sleeping porch add-ons.

ELECTRIC TIP

RESTORER'S NOTEBOOK IS ONE OF my favorite OHJ features, but I have to comment on "Insulating Wiring" (July/Aug. 1995). If the rubber insulation in an electrical box is dried out or missing, it is probably also [continued on page 14]



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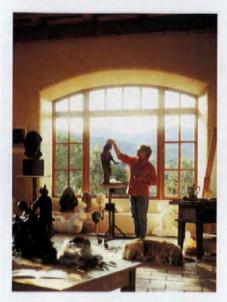
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[continued from page 12] dried out behind the box and in the walls as well. It would be much safer to completely rewire the circuit. Another note: most municipalities require permits, although not necessarily an electrician, to perform work such as this. Thanks for a thought-provoking column; I learn something from every issue, and I look forward to future tips.

> - TOM RUSSEL Portsmouth, Va.

RESTORATION RETURNS

RESTORATION, THE EXHIBITION and conference on preserving our cultural and industrial heritage, is moving west. In addition to our annual East Coast event, we'll be holding a show in the West or Midwest each year. The next shows will be held at the San Francisco Hilton & Towers December 10 to 12, 1995 and at the Baltimore Convention Center March 10 to 12, 1996.

To get on our mailing list, call, write, or fax us at RAI/EGI Exhibitions, 10 Tower Office Park, Suite 419, Dept. OHI, Woburn, MA; (617) 933-6663 (visitors), (617) 933-9699 (exhibitors), or (617) 933-8744 (fax).

- STEVEN SCHUYLER RAI/EGI Exhibitions Woburn, Mass.

COLORED STORMS

REGARDING YOUR ITEM ABOUT colored storm windows for old houses (Ask OHJ, July/Aug. 1995), I want to bring another company to your attention. National Pride offers good storm windows (and doors) at reasonable prices, and they come in nine colors, including some shades that are especially suited for old houses. For more information, contact National Pride Storm Doors, 2964 Clydon SW, Dept. OHJ, Grand Rapids, MI 49509; (800) 968-6245.

> - PAUL HAYDEN South Bend Heritage Fdn. South Bend, Ind.

DETECTOR ETIQUETTE

THE IDEA OF USING A METAL detector to find plumbing, etc. in an old house ("A Detector in the House," May/June 1995) is wonderful. But it's important to add to the discussion that it is both immoral and illegal to use a metal detector on someone else's property without permission.

Unfortunately, a lot of history has been lost forever at the Erie County Historical Society building. The culprits are people who came onto the property with metal detectors to "treasure hunt." This is an all-too-common problem and one that I felt needed a mention on your pages.

 Susan Bates Hansen Erie Country Historical Society Erie, Pa.

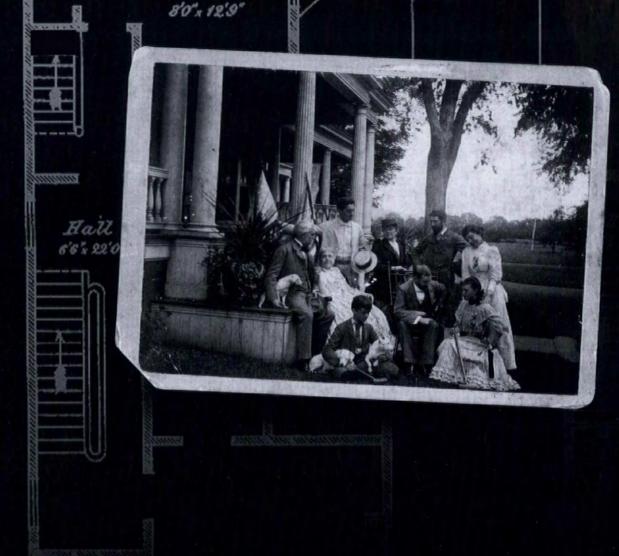
CORRECTION: As a few readers noted, in "Greek Temples for a Young Republic" (May/June 1995),

we showed a Greek Doric column with a base. Although the Doric Order is generally accepted to have no base (right), the examples we showed are directly from Asher Benjamin's "The



American Builder's Companion," 1827. Apparently, Benjamin preferred the base, or simply erred.

- THE EDITORS



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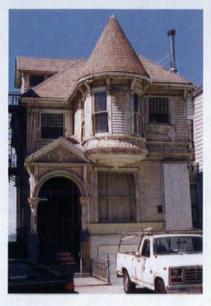


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In the Gutter

On our 1891 house, the original redwood gutters are still working fine, but the turret gutters were replaced some time ago with vinyl. I would like to return them to wood. How are round wood gutters made and who makes them?

Mike Korchinsky
 San Francisco, Calif.

MAKING ROUND WOOD GUTTERS IS an expensive, custom job, costing about 10 times as much per linear foot as straight wood gutters. Generally, they are fabricated in segments that are cut from thick sections of lumber. To get stock big enough to handle the arc, 2" dimensional lumber is glue-laminated together. Next, the piece is cut to the proper radius on a band saw. The segments are then finger-jointed together and passed through a shaper three times, once for the face profile (designed to match the existing gutters), once for the trough, and finally for the back.

The turret on this classic San Francisco home is missing its original redwood gutters.

A number of woodworking shops handle round gutters, especially in cities with large populations of Victorian houses. One is Haas Woodworking Company, 64 Clementia St., San Francisco, CA 94105; (415) 421-8273.

Metal Roof Repair

Our 1900 Queen Anne has terne metal roofing in low-pitched areas. In general, it remains in good shape, except where the downspouts pierce the eaves. There, the paint is lifting and there is some rust. Our local sheet-metal company has refused to attempt repair, saying the only solution is costly replacement of all the terme. Are there other options?

- Jim Bodine New Ulm, Minn.

TERNEPLATE IS STEEL THAT IS coated with an alloy of lead and tin. Any breaks in the coating will lead to not only rusting of the steel, but galvanic corrosion of the top [continued on page 18]

Pressed Brick

Many of the 19th-century houses in Brooklyn Heights are built with brick that plainly differs from modern masonry. It's narrower and longer, the mortar is thinner, and there is highly ornamental detail in some bricks. I have heard it called "hydraulic" or "pressed" brick. Is this available today?

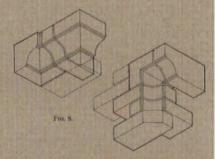
Basil PollittBrooklyn, N.Y.

IN THE SECOND HALF OF THE 19TH century, new steam-driven machines pressed brick from relatively dry clay mixes. This created, for the first time, uniform brick. It also allowed for intricate decorations because the dry mix held detail made with iron and brass molds.

The standardized brick made the mason's job easier, and it also tended to make buildings look very modern to contemporary eyes. Adding to the appearance, masons tinted the mortar to match the brick and kept joints very thin — the "butter" joints so difficult to repoint today.

By the turn of the century, the machine-age look was out. Brickmakers developed ways to make their products look more rustic, scratching their faces and creating random discolorations.

Although some companies offer handmade "soft mud" brick today, we are unaware of a source for pressed brick. Try contacting architectural salvage yards.



The manufactured brick of the late 1800s included standardized common units and designs for trim.

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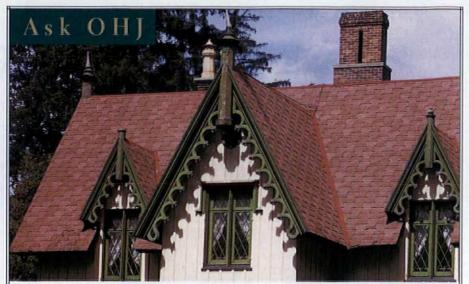
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[continued from page 16]

layer as the two metals interact in the presence of rainwater. That means the problem quickly snowballs. For relatively minor damage, however, you may be able to repair the roof. Larger problems may require at least partial replacement.

To repair small damaged areas, remove paint with a chemical stripper, scrape away any excess tar and wash with mineral spirits or gasoline. Then scour the rust and patina away with steel wool.

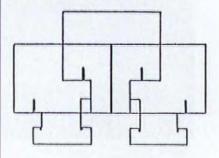
To refasten seams, or to patch a break, use solder that's half tin and half lead after applying rosin flux. Do not use asphalt compounds; their acidity can cause corrosion. Paint with a linseed-oil iron-oxide primer, and finish coat to match the roof.

Interlocking Shingles

We will be replacing our roof soon, and I'd like to use a material like that on the house shown in an old OHJ. I'm assuming it's a composition roofing, but I have never seen anything quite like it. What is it? And where can I find it today?

 Laura Ardis Sulphur Springs, Tex.

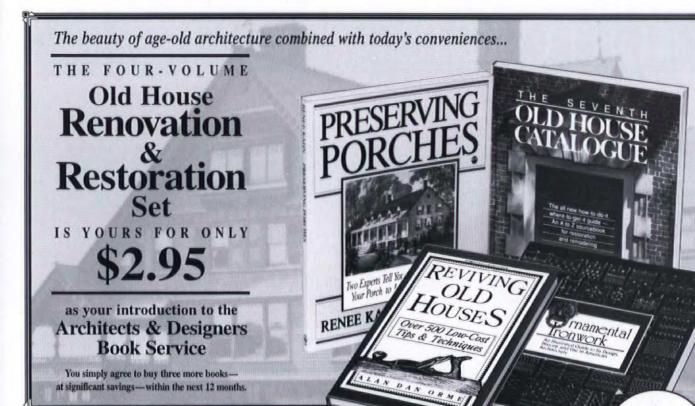
THESE INTERLOCKING ASPHALT SHINgles became popular in the 1920s ABOVE: Clearly not original to a Victorian house, the interesting pattern is created by the T-shape of the shingles. BELOW: The slots of one course ride on the ears of the course above, creating a wind-resistant roof.



and 1930s. The woven pattern is created by their interlocking design. Sold for their increased wind resistance, they are T-shaped with ears to lock the shingle to the course below. You can buy various interlocking shingles today, but they are a premium-priced product.

Here are some manufacturers. Contact them for distributors near you. CertainTeed Corp., P.O. Box 860, Dept. OHJ, Valley Forge, PA 19482, (610) 341-7000; Georgia-Pacific, P.O. Box 1763, Dept. OHJ, Norcross, GA 30091, (800) 284-5347; IKO, 120 Hay Road, Dept. OHJ, Wilmington, DE 19809, (800) 323-7171; Owens-Corning Fiberglas World Headquarters, Document Center - 3, Dept. OHJ, P.O. Box 10014, Toledo, OH 43682, (800) 766-3464.

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by Renee Kahn and Ellen Meagher

Discover how to make any porch structurally sound, while preserving the original design. Included are complete step-by-step instructions for everything from simple repairs to total overhauls, plus listings of suppliers and specialty stores. Over 160 photographs and drawings and a full glossary complement the text.

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RESTORER'S NOTEBOOK

HONEY OF A TOOL

 $B^{\rm EEKEEPERS}$ USE A HIVE TOOL TO remove sections of honeycomb. The tool is thin and flat, with a bent end - sort of a cross between a prybar and a putty knife. The flat end tapers to a sharp edge that's great for getting under moulding without damaging the woodwork, and the bent end is shaped for effective prying in limited spaces. You can find the tool at local beekeeping supply stores, or order it from Dadant & Sons, P.O. Box 178, Dept. OHJ, Durham, CA 95938; (916) 893-0921.

-BILL HOUGHTON Sebastopol, Calif.

The hive tool is good for more than just beekeeping. It works like a small, sharp prybar on wood mouldings and windows.

WALLBOARD SKATE

I CART 4' x 8' SHEETS OF PLYWOOD and wallboard on a roller skate. I altered the old gear (not an "inline" skate, but an old one with four metal wheels) by cutting Vshaped notches in the front and back and bolting a heavy-duty 90 degree metal flange to them. Now I simply rest a sheet in the holder and wheel it across the floor.

> - JOEY BURKE Washington, D.C.

PULLING LINOLEUM

T ERE'S YET ANOTHER LINOLEUM H stripping method that I found easy and relatively clean. In addition to linoleum, I had carpet padding and asphalt tile to contend with. I bought an 8" cube of dry ice and had it cut in two. Then I laid

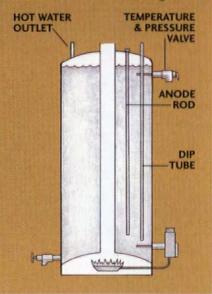
MORE WATER HEATER MAINTENANCE

N EASY WAY TO PROLONG THE life of a water heater is to replace the anode rod. This length of metal (usually magnesium) is meant to react with minerals in the water, sacrificing itself to protect the rest of the tank. When the rod is spent, the minerals will corrode the tank itself. The anode should be checked at least every five years (twice as often if you've got a water softener). If the anode is corroded, split, or pitted, replace it. Try contacting the water heater manufacturer: many

The anode rod screws into the tank from the top. The replacement should run its full depth so it will protect the whole tank.

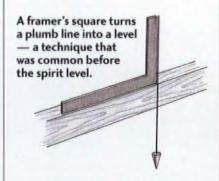
plumbing supply stores do not carry compatible new parts.

> - SAM WEINSTOCK Chicago, Ill.



the two pieces on the floor. After about a minute, I hopscotched one piece over the other and went to work on the area frozen brittle by the ice. Everything popped up and shattered like glass when I pryed at it with a putty knife. All that was left were a few shreds of tar paper.

> - DANA C. JENNINGS Upton, Wyo.



OLD-FASHIONED LEVEL

F YOU'RE STRANDED WITHOUT your spirit level, you can determine level using this old technique. (I read about it in an old woodworking book.) Simply hang a plumb line and hold one leg of a framer's square against the line. The other leg will be level.

> - I. Burness Little Rock, Ark.

SHIM DISPENSER

 ${
m I}$ USED AN ENTIRE BUNDLE OF SHIMS to tighten up the underside of my creaky Queen Anne floor. So, I made a shim dispenser. I poured glue into a glass jar and placed my wedges in it, thin end in down. When I needed a shim, I simply pulled one out - using another shim to spread the glue around a little - and put it in place.

- JENNIFER CAUFIELD San Antonio, Tex.

Share your solutions! We'll pay \$25 for hints or shortcuts that might help other old-house owners. Send them to: Notebook Editor, Old-House Journal, 2 Main Street, Gloucester, MA 01930.

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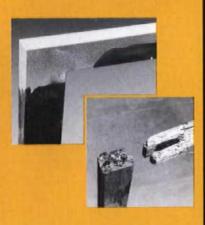
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Frank Furness, Victorian Pioneer

BY JAMES C. MASSEY

ARING, OUTRAGEOUS, EVEN WILD - ADjectives not ordinarily applied to a Victorian architect — describe Philadelphia native Frank Furness. But then Furness was no ordinary Victorian architect. In the 1870s, he developed a uniquely personal architectural style that elicited gasps of horror and disbelief from public and press alike. Even in this century (before Victorian styles returned to fashionable acceptance), many regarded his work as the ugliest from an "Age of Ugliness."

Fortunately, Furness's place in history is secure. Today he is admired for the power and strength of his expressive designs and hailed as one of the most inventive architects of his period. He was certainly among the most influential. When Furness began his architectural career in 1850, Philadelphia was a staid and sober Quaker city, comfortable in its old traditions. Half a century later, he left a metropolis on the forefront of architectural excellence. Whether the critics liked it or not, Furness's work was popular with the emerging business and railroad elite, who wanted energetic, avant-garde architecture to provide a public identity for their growing enterprises, as well as striking new houses to testify to their personal wealth and importance.

A Talented Trailblazer

BORN IN 1839, FURNESS STARTED DESIGNING BUILDINGS at the age of 20 as an apprentice in Richard Morris Hunt's new atelier. Hunt was the first American graduate of the French École des Beaux Arts. His studio was established to train other American architects in the methods of the École.

The Civil War interrupted Furness's work in the Hunt atelier. Now just 22, Furness received a commission in Rush's Lancers, the Sixth Pennsylvania Cavalry so-named because its members actually carried lances (hopefully only for ceremonial purposes). After a dashing career and promotion to the rank of captain, Furness won the Congressional Medal of Honor for exceptional valor under enemy fire in Virginia.

After the war, Furness returned to Hunt's office for a few years before establishing his own firm with John Fraser and George Hewitt. When Hunt died, Furness paid homage to his early employer:

"He stood in the relation of father to me and all that came of my professional life, and I do not think I shall ever take a pencil in my hand without thinking of him in some way." Not content to copy the mode of the École, Furness looked to his own creative genius. He quickly

established an individualistic architectural style, richly ornamented with patterns abstracted from nature. Later, Furness's influence was clear in the Art Nouveaustyle decoration of skyscraper pioneer Louis Sullivan, who had apprenticed at Furness's office.

Furness's reputation was firmly established in 1872 when he won a competition for the design of the new Pennsylvania Academy of Fine Arts. The handsomely restored Academy still stands and is, to use a period term, "muscular" in its bold design. It features a cornucopia of Furness trademarks; an arch supported in its center, overscaled features, ornament derived from nature, polychroming,

Frank Furness, son of a Unitarian minister and brother of a Shakespearean scholar, trained as an architect in Richard Morris Hunt's atelier.

and the extensive use of colored tiles. The main interior walls are covered with a stylized flowerand-butterfly pattern. Furness's sketchbooks show natural features being translated into abstract design in a manner remi-

niscent of Christopher Dresser, a 19th-century English designer.

Rustic Rooms & Novel Homes

TO HIS CONTEMPORARIES, FURNESS CUT THE IMAGE of a tough and confident self-made man — more than a bit eccentric. A noted sportsman, he let loose his penchant for hunting by designing a bizarre "camp room" addition to his Philadelphia town house. It was a sort

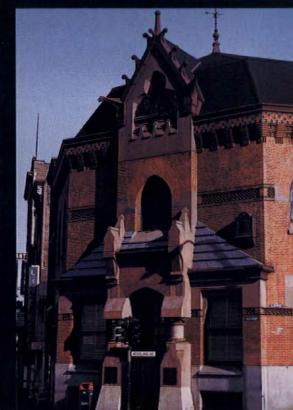




CLOCKWISE FROM UPPER RIGHT: The rounded first-floor end of the University of Pennsylvania's Library (now the Graduate School of Fine Arts) is a distinctive counterpoint to the fortress-like tower. A sculpted terra-cotta lily is an ornamental accent on the façade of a Rittenhouse Square town house. The exaggerated arches, contrasting materials, and dramatic angled entrance of the 1876 Centennial National Bank are typical Furness embellishments. Complex dormers and noteworthy porch details are the highlights of the 1879 Hare House. The picturesque Rhawn House is an outstanding example of Furness's suburban architecture.









of western hunting shack brimming with trophies and rustic furniture. His manner was also brusque and unconventional. Louis Sullivan recalled Furness in his memoir Autobiography of an Idea:

> "He affected the English in fashion. He wore loud plaids, and a scowl, and from his face depended fan-like a marvelous red beard, beautiful in tone, with each separate hair delicately crinkled from beginning to end. Moreover, his face was snarled and homely as an English bulldog."

Furness was a bit much for old Philadelphia, but he got along well with bankers and railroad executives. representatives of that booming and self-confident

capitalistic age. Naturally, the houses designed for such men were tamer than the ones intended as business showcases, but Furness's originality shone through. (Many houses — several score. in fact - were deFurness was noted for featuring stylized floral ornament on his buildings, such as this arch on the Pennsylvania Academy of Fine Arts.

signed by his partners as well, particularly Allan Evans.) Furness's town houses of the 1870s and 1880s were mostly constructed around fashionable Rittenhouse Square in Philadelphia. Generally, they were built of brick and were highly ornamented with complex wall and roof shapes. Perhaps the best survivor is the 1875 Hockley House, featuring a splendid recessed corner entrance porch replete with a superb, second-floor rectangular window. The interiors of some town houses are extraordinary, even for that highly decorated age. The rooms are totally designed — walls, ceilings, fixtures, and furniture all from the master's hand.

> Furness also built houses in the suburbs, mostly on the prestigious Main Line of [continued on page 28]



CENTER: Furness received over a hundred commissions to design railroad stations. His first stations were small depots for the Reading Company, many of which still stand on the lines out of Philadelphia. RIGHT: The Pennsylvania Academy of Fine Arts, Furness's masterpiece, was the first to show his bold personal style. At the time, the polychromed façade was called "Venetian Gothic."







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[continued from page 26] the Pennsylvania Railroad and in other railroad suburbs. These houses were larger and bulkier, with complex roofs, simpler ornament and less of it. Projecting hooded dormers and multiple porch columns were other common Furness flourishes on these suburban houses - usually frame

or stone rather than brick.



Frank Furness was a whiz at caricatures of friends and family. As his self-portrait depicts, the drawings were none too flattering.

Furness worked mostly in Philadelphia; his buildings are rare farther north than New York and New Jersey or farther south than Washington, D.C. Perhaps the most famous example is the Physick House in Cape May, New Jersey, now a museum. Furness designed several houses in Cape May and spent his summers on the Jersey shore, sketching local plants and scenery in quick, concise strokes that were later translated into stone and terra-cotta.

As Furness aged, his growing firm gathered larger and more important commissions, but showed less of his creative presence. In his later years, in fact, he was remembered more as a Civil War hero than as a pioneering architect. However, Furness's younger partners, including George Howe, who later gained architectural fame, carried the firm and its tradition of excellence well past his death in 1912.

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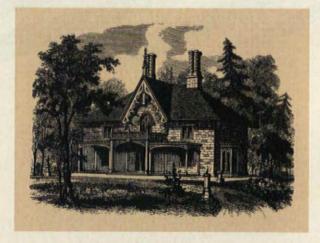




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Identifying

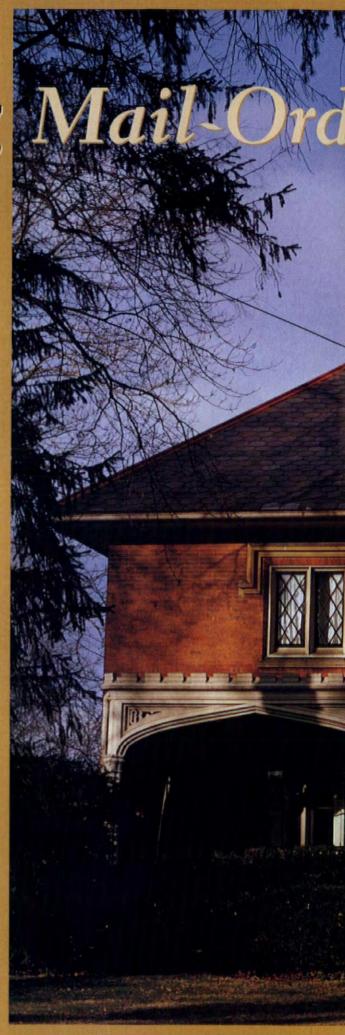
RYING TO DETERMINE whether your house was built from mail-order blueprints or from materials (and plans) ordered by mail is more than just an interesting challenge. From the standpoint



of design and material quality, such catalog houses are in a class by themselves. - In the 1840s, when entire plans for houses (not just details) became com-

mon, and continuing until World War II, published house designs were usually prepared by experienced architects. For their time, these dwell-

ABOVE: Downing illustrated his 1842 pattern book, Cottage Residences, with charming scenes of Gothic Revival dwellings. RIGHT: When constructing the **Upham-Wright** house in Newark, Ohio, local builders copied the elevation and floor plan of "Design II" in Downing's book.







ABOVE: The house styles in pattern books were more current and fashionable than what was locally available. This Second Empire house is a duplicate of the example in Bicknell's Village Builder. BELOW: The plan for this Italianate-style house first appeared in E.C. Hussey's 1875 Home Building.



ings were more high style or up-to-date than a local builder's creation. The floor plans of these professionally designed houses were also better thought out, often containing special labor-saving features. The practice of purchasing precut materials for houses became common in the early 20th century. The products were usually of the highest quality, so mail-order houses often were the most well-constructed dwellings in a neighborhood.

Four major categories of catalog and mail-order houses were available between the 1840s and the 1940s; each type is illustrated by constructed examples.

PAITERN BOOK DESIGNS COPIED BY LO-CAL BUILDERS: Model plans and elevations for use by local builders go as far back as the books by Sebastiano Serlio, a 16th-century

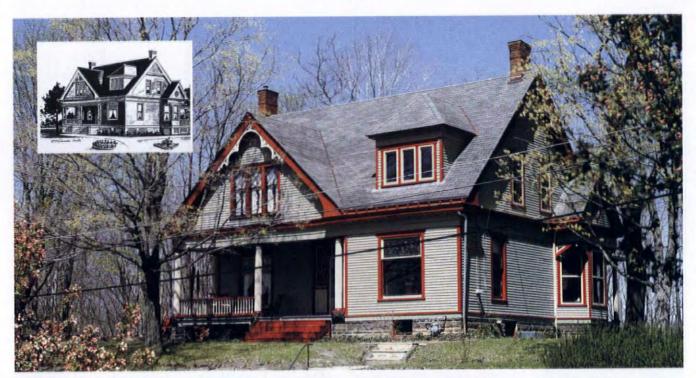
Italian architect. In America, their heyday begins with Andrew Jackson Downing. His Cottage Residences (1842) and The Architecture of Country Houses (1850) provided appealing perspective views, floor plans, and occasionally, details for local emulation; it was not uncommon to find builders making copies or variations of these designs. Other



Published in 1887, Palliser's New Cottage Homes shows house elevations and details for architectural elements.

popular books included Calvert Vaux's Villas and Cottages (1857) and E. C. Hussey's





Home Building (1875). Even when the models were enlarged or improved, the pattern book design is usually readily traceable.

PATTERN BOOKS WITH MAIL-ORDER PLANS: The first pattern book "for the convenience of such as may wish to build after any of the designs in this work" that offered "lithographed working drawings and printed specifications" was probably Village and Farm Cottages (1856) by architects Henry W. Cleaveland, William Backus, and Samuel D. Backus. Naturally, since scaled working drawings were in elevation view, constructing the buildings was made more accurate. Soon supplying mail-order plans became quite common. Other architects and designers began publishing pattern books, including Palliser, Palliser & Company (1887), George F. Barber (from 1891), and William Radford (1898 onward). Firms, such as the Home Builders Catalog Company and the Standard Homes Company, were active in the 1920s and 1930s.

HOUSE DESIGNS BUILT WITH CATA-LOG-BOUGHT MATERIALS (NOT PRECUT): Some companies, noted later for precut houses, first offered materials "enough to build the dwelling" from the sill plate up, not cut or fitted. The advantage, of course, was that the owner received the correct amount of materials in one order. A local carpenter would cut the lumber according to the accompanying plans. Two companies selling houses this way were the Chicago House Wrecking Company (1909), and Sears, Roebuck and Company (1912 and 1915 catalogs).

MATERIALS: First made popular by Aladdin Company in 1906-7, this method was soon picked up by other firms, notably Sears, as well as Bennett Homes and Sterling Homes. The materials received by the owner were precut and systematically labeled, simplifying the assembly process. In recent years, these "package" dwellings have become well known.

Uncovering the Clues

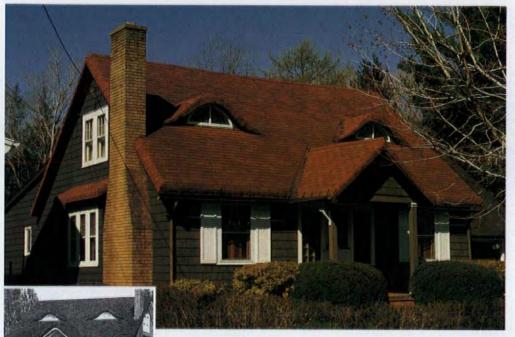
HOW CAN YOU KNOW IF A HOUSE IS A PATtern book or mail-order dwelling? There are several ways to find out.



At the turn of the century, the Radford Company sold house plans with scaled drawings and elevation views. "Design 86" from a 1904 edition of Radford Ideal Homes was built in Sharpesville, Pennsylvania.

Homeowners and builders often altered house plans to suit their tastes and needs. Here, a porch was added to "Design 500" from the 1903 Radford American Homes.





TOP: Except for the addition of shutters, this Fredonia, New York, home has changed little since its construction in 1930. INSET: By the early 20th century, the turreted Victorian plans were replaced by house designs in simple styles, such as the English Revival cottage from the Home Builders Catalog. RIGHT: As this Sears catalog boasts, the "Honor Bilt" system evenly spaced roof rafters and wall studs, making mail-order houses extremely sturdy.

RESOURCES

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1785 Massachusetts Ave., NW
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(202) 673-4058
Publishes Houses by Mail,
by Katherine Cole Stevenson
and H. Ward Jandl.

Dover Publications, Inc. 31 East 2nd St. Mineola, NY 11501 (516) 295-7000 Offers reprints of plan books in their Antiques and Collectibles catalog. First, check for numbers written or stamped consistently on joists, rafters, or other members in cellars or attics. Two methods for labeling the materials were used.

Aladdin marked its lumber with dimensions. For instance, when the plan called for a 2x8 that was 12'6" long, lumber in that size was simply selected from the pile of 2x8s. In a 1920 Aladdin house that I surveyed, the first-floor joists were marked "11-10" on the side near the end — naturally, all joists were interchangeable. An illustration from a 1952 Aladdin catalog shows this system still in use.

ternate system by labeling the lumber with a code number, not a length. An illustration from a 1918 Sears catalog shows the labeling method clearly; a 1929 construction diagram depicts this approach as well—a letter and a number for each type of unit (all identically numbered pieces being the same). When laid out at the building site with the lumber arranged in organized piles, finding the pieces was very easy.

Other companies, particularly Sears, used an al-

If the lumber is only marked on the end (as shown

in a 1929 Sears catalog), you might have a whole house of marked lumber and never know it — short of dissecting a wall! Most precut houses had coded marking of one sort or another.

The house's hardware can be an important clue. Sears and other companies offered lighting fixtures, complete kitchens and bathrooms, and plumbing and heating. From the catalog, the owners picked the styles they liked in the quality they could afford. By locating trade names and comparing them to the ones in the period catalogs, it

is possible to zero-in on the house's origin. (Of course, anyone could purchase sinks or furnaces from Sears, but mail-order houses often had everything from one source.)

Therefore, if you have a "Hercules" hot-air furnace made by the American Heating Company of

Chicago, it was a brand offered in Sears's catalogs from 1915 through 1929; their 1910 hardware catalog lists it as well. If your 1920s plasterboard is stamped "Goodwall" sheet plaster, it was sold by Sears. Even window hardware is sometimes marked by a brand name or a patent date. Lucky sleuths can turn up unexpected clues. In one Ohio house I studied, the owners produced an old ring of keys to all doors and cabinets that



bore an Aladdin Company fob - complete with serial number!

Another way to determine a mail-order or pattern book house is to check the blueprints, if they can be found. All precut houses had a full set of blueprints as a key

to assembling the lumber; mail-order blueprints were also quite complete. These plans are sometimes still in the house. Carefully search the attic, built-in cabinets. and the cellar. Contact former owners because, for sentimental reasons, they often take the plans. Blueprints usually specify the

company's name, the model number, and sometimes the draftsman's or architect's name or initials, but not always. One set of blueprints I uncovered left off any mention of the company or model name.

Good-luck piece: This Aladdin

ber of a mail-order house.

key ring revealed the serial num-

Do research in local newspapers during the year of the house's construction. In the early 20th century, houses are often mentioned under "Building News" and in special building or home-improvement sections. Some citations are quite specific: a newspaper item for Nov. 1, 1916, stated that "Ray Gibbs is putting up an Aladdin House on what was part of the Paschke farm, West Main Street." Exact locations are determined from real estate maps, cross-referenced

with directories.

Finding a nearby Sears house can even be helpful. A builder would often erect a row of precut houses "on speculation," knowing that the Sears or Aladdin reputation, the quality materials, and the up-to-date design would be selling points.

A related method is to search for "local tradition." Long-time residents of a neighborhood might recall that the material for your house was "all brought on a big truck" or "sent one day from the railroad station." Discovering this information is not always easy, however. The simplest way is to write a letter or place an ad with a photo of the house in the local paper asking for information. If you are doing restoration work,

BOTTOM: Popular house plans were often published in new editions of the pattern books, so check copies 10 years before and after the date of your house's construction. Built in 1910, the Henry J. Green house in New York was matched with "Design No. 134" from the 1913 Chicago House Wrecking Co.'s catalog.







All of the lumber for "The Detroit" from the Aladdin Company was shipped precut and labeled for easy assembly at the site.

some local papers are interested in "before and after" articles. Either way, someone may recognize your house and give you a gold mine of information.

Studying your house's construction is another way to determine if it is precut. The companies carefully pointed out that their houses were sturdy and well designed. As Aladdin observed in 1918, "if you attempt to tear apart . . . an Aladdin house, the most expert contractor could not tell it from any other first class frame dwelling because

"We will furnish all the material to build this eight-room house, consisting of lumber, . . . hardware and painting material," says a 1918 Sears catalog about the "Arlington." However, the lumber for this Westfield, New York, house was not precut.

there is no difference." Sears was proud to point out that its "Honor Bilt" system was in all ways sturdier and more weather-tight than standard built houses. In fact, most precut houses, such as Aladdin and Bennett, were constructed in a thorough manner with the best lumber.

Spacing of roof rafters, floor joists, and even wall studs can be examined in your attic or cellar. Of course, just because your home is soundly built does not mean it is precut. Many first-class frame houses were constructed in the same way. Except for summer cottage models, lightly built houses were usually not offered by the precut home companies — though Sears did include a few inexpensive dwellings of "Special Built" construction with rafters widely spaced.

Unless you're lucky enough to find blueprints, the clues may only reveal that the house is precut and possibly the company that designed it. To definitively find out the company, the model name or number, and a date means embarking on the last step.





One of the two labeling systems

order houses.

used to sort the lumber for mail-



The mail-order house companies offered choices for building materials. In this case, the Sears plan was shown with clapboard siding but was actually built with brick.

Make a careful search of the illustrations in any pattern book or catalog you can lay your hands on. (Choose editions from the time of your house's construction.)

Fortunately, a fair number of popular plan books have been reprinted (see Resources on page 34).

As you study the catalog plates, keep two photographs of your house (front views of the left and the right sides) handy. Select catalogs 10 or 15 years before and after the date

of your house. Occasionally, people waited many years before building.

Match your house to a design with great care. Published designs were often altered in execution. Even precut houses were changed during construction by modifying a number of elements, such as the size or placement of windows, the type of exterior wall cladding, the form of a dormer, and the addition or removal of the chimney. Some companies, like Bennett Homes, customized their package plans.

Compare floor plans, too. Popular designs were often pirated by rival firms. To avoid copyright infringement, minor changes in size and exterior detailing were made. Occasionally, entirely different floor plans were used.

Of course, there was nothing to pre-

vent a local carpenter from building a version of a Sears or Aladdin house based on illustrations or duplicating (with "improvements") a catalog house. These

copies confirm the stylistic authority and popularity of the mail-order house - reminding us of its enduring appeal then and today.

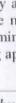
Dr. Reiff teaches art and architectural history at the State University of New York, College at Fredonia. He recently

completed a book-length study on pattern book and catalog houses in America.

The sound construction and affordability of mail-order houses made them a favorite for starter homes, particularly compact designs like Sears' 1928 "Crescent."









AWARD-WINNING

Steps for Making Decorated Ceiling Ornaments

BY DAVID FLAHARTY

N THE DAYS OF HIGH CEILINGS, FANCY cornices, and hanging chandeliers, an elaborate center medallion was the finishing touch to any ceiling. Most high-style homes - especially row houses — built between the early 18th century and the Great Depression had these plaster ornaments. Their design

schemes followed the house's overall styling, perhaps Greek Revival, Second Empire, Italianate, or Colonial Revival.

Few have survived intact. If the medallion is not repairable, you can create a new one that matches representative elements of an original or the overall detailing of the house — say, lines from the cornice and ornament in the mantel. A job for a skilled plasterer, it involves turning a round base and then adding cast enrichments. Here's how I produce plaster medallions. If you're experienced, use the directions to tackle the use them as specifications



Getting Started

IF YOU'VE GOT A LARGE MEDALLION, CHANCES are you've also got a high ceiling. Plastering 11' up, 14' up, or more, is not step-ladder work; you need solid footing and a good deal of workspace. I recommend 8' x 8' staging. Attach flood lights so you can see and a mortarboard to hold ornaments

Before getting started with the plaster, run rough electrical service to the center of the room. Install a 4" junction box there, mounted flush with the ceiling. Snap a chalk line from the center of a chimney breast or main wall and through the middle of the electrical box. This line will serve as a reference point for the segmented enrichments. Also mark the locations of joists and other good nailers for fastening the surround. Make sure the ceiling is sound. If not, repair or replace damaged lath and plaster. or install drywall. If you open up the ceiling for electrical work or repairs, take the opportunity to add additional blocking for anchoring screws.

Making a Mold

THERE ARE TWO PARTS TO MOST MEDALLIONS: a run surround and cast enrichments. We'll get to turning a run surround, but first, you'll need to make a casting mold. Prepare a model (a piece from an original medallion or new sculpture in clay or wood), then glue it to a flat marble surface and fence it with wood or sheet metal. Seal around the fence with clay or plaster to prevent leakage.

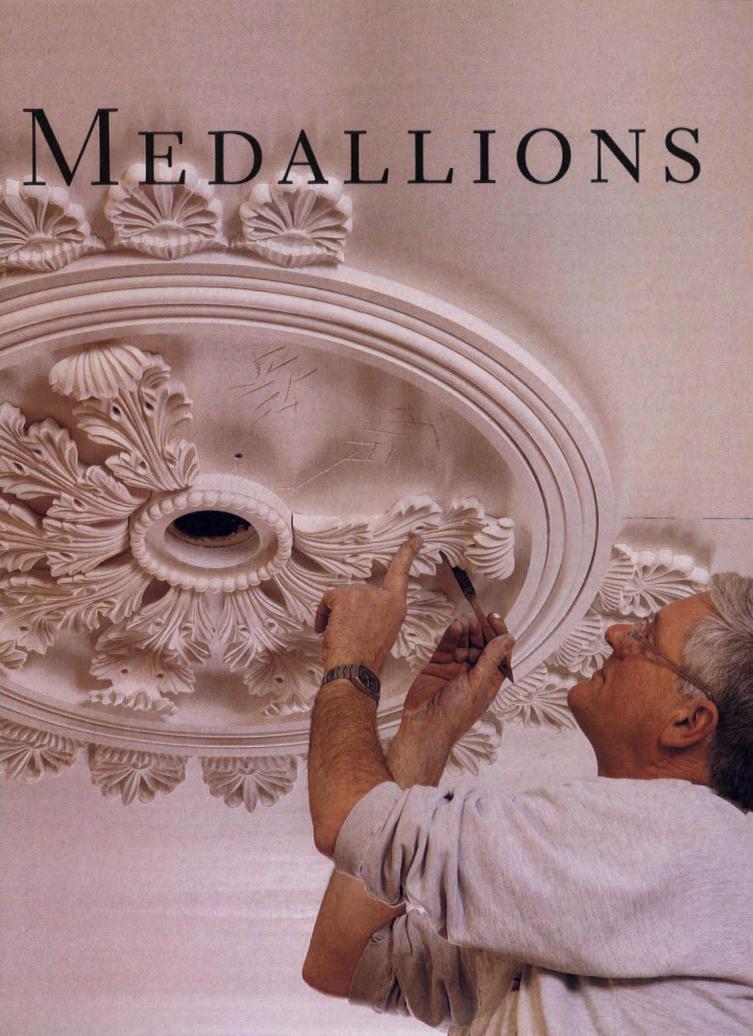
Lather the model with an alcoholfree neutral liquid soap; the soap film acts as a separator so that the rubber molding compound does not stick to the prototype. Allow the soap to dry and then burnish it (wipe away any soap powder) with a dry brush.

Originally, medallions were cast in melted hide-glue molds, but now there are many modern mold-making rubbers available. Silicone is good, but it's needlessly ex-

For this project, a Greek Revival town house in Philadelphia, I turned a run surround and then applied cast enrichments.



For final finish, specify a three-coat application of oil-based paint, beginning with an alkali-resistant, lowpigment primer, or use a latex emulsion system with an acrylic plaster primer plus two finish coats.



Casting Enrichments

Specify casting plaster for the ornaments. It contains starch, which creates a hard. damage-resistant surface. Moisten the urethane mold with water from a plant sprayer before pouring in the plaster. No separator is required. Pour the plaster into the mold slowly and evenly. To ensure that it settles into the nooks and crannies, push it in place with a brush (fig. 1) and gently jiggle and slap the mold.

Just before the plaster sets, scratch the back surface to make a better bond between ornament, adhesive, and the ceiling. I key the casts with a notched trowel, but any tool that creates grooves for the adhesive to grab will work (fig. 2).

Plaster sets in about 15 minutes, but follow the manufacturer's directions. Carefully peel the mold away and set the enrichment aside (fig. 3). You can repeat this process for as many pieces as you need. You might even cast a couple extra, just in case. Also, cull any defective pieces.

pensive. Polysulfides are OK, but they have no memory (they loose their shape unless you keep a plaster cast in them at all times). Latex rubber is good because it resists tearing, but it must be painted on in as many as 20 coats and it shrinks when it hardens. That can mean your enrichments don't line up well. The best option is a two-part mixture of liquid urethane rubber in 30-durometer







hardness. It is inexpensive, has a long life, and holds its form.

For standard ornaments, cover the entire model with rubber by 1/8" to 1/4". More than that, and the mold will be stiff and it will be hard to demold the plaster pieces later. How-

ever, for large enrichments, or those with very deep relief, extra rubber may be needed so it will keep its shape.

Building a Base

YOU'LL HAVE TO determine whether the medallion will have a run surround moulding (a turned plaster base). Many medallions have one of these, with cast enrichments applied to it. However, after 1850, especially in the South, medallions might not have had a run surround.



Pour the rubber in a small, steady stream so it flows smoothly over the model without trapping air in the crevices.

Traditionally, run surround mouldings were turned directly on the ceilings. However, for medallions that are less than 36" in diameter, I recommend running them on a bench and then applying them to the ceiling. The process is essentially the same; it's just harder overhead and upsidedown. For benchwork, use a mortarboard that has a plastic laminate top. It's non-ab-

DESIGN DETAILS

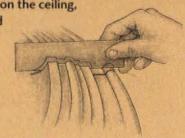
If possible, use the house's existing medallion, or representative remnants, as a model. If not, try examples in neighboring houses. Also, ornamental plastering shops have large collections of medallion parts taken from other old houses. Pick and choose the surround profile and enrichments so they match the overall patterns of the house's cornices, mantels, and mouldings. To reproduce ornament that's only documented in pictures or just a memory, you can sculpt the elements in clay. Refer to stylebooks and trade catalogs of the house's period for more clues.

To record the profile of a surround moulding, you can

scribe it, use a profile gauge, or, best, make a cross section. To do this, cut a thin saw kerf through the moulding. Then slip a piece of 22-gauge galvanized metal into the kerf and trace the moulding. Now you have a perfect replica of the design. To copy existing cast pieces, use the objects themselves as models for the molds. If they are part of an existing medallion that's on the ceiling,

use a paste rubber and mold them in place.

To copy an existing run surround, slide a piece of sheet metal into a thin crosscut kerf.



sorbent, making removal and cleanup easier. Mark the circumference of the medallion by placing a pencil against the arm and spinning it.

Whether turning in place or on the bench, you'll need to build a jig consisting of a template and a spindle to turn it. To create the template, transfer the surround profile to 22-gauge galvanized sheet metal stock and cut it to rough shape with tin snips. Then carefully file it to the exact profile. I use half-round, rat-tail, and flat files, as well as a carbide rotary file chucked into a drill press. For benchwork, the template should be designed so the base has a 4" diameter circle in the middle — this is where the electrical box will go.

The blade will ride on a wood arm (or stock). Anchor the arm to a nail in the tabletop, or to a screw turned in a wood block that's force-fit in the ceiling's elec-



When ready, mix up plain gypsum plaster (plaster of paris) and apply it onto the board in a ring the size of the medallion.



Attach the pivoting arm and spin it through the plaster. Where needed, feed additional plaster ahead of the revolving blade.

trical box. Set up the arm with a hole for the spindle. I use a shop-made sheet metal bracket with a notch cut in it. Attach a slipper (an additional wood member that forms the top of a T). A brace (a wide plank or plywood support that lays over the T to prevent flexing or vibrating of the arm as it spins) is especially recommended for running the disk on the ceiling because it catches excess plaster. Nibs (protective sheet metal strips) will keep the edge of the slipper from wearing down too quickly.

For bench turning, apply a separator (a barrier to adhesion) to the work surface. Petroleum jelly, electricians' lubricants, soap, and oil will work, but if the



To strengthen the disk, add sheet fiberglass or erosion control burlap cut to shape, and then pour on more plaster.



It will take 20 to 30 passes to create a sharp form. After every few passes, remove the template and clean hardening plaster from it.

RING OF LEAVES CENTER CLUSTER

PLAIN-RUN SURROUND

SURROUND ENRICHMENT

PLAIN-RUN

SURROUND

Medallion Makeup

Ceiling medallions look complicated, but on closer inspection, you'll notice that they are actually many small, repeating designs. From the center outward, medallions typically consist of a canopy (not shown above) made of metal or cast gypsum, a ring of small leaves, a center cluster of ornaments, a plain-run or enriched surround (either round or elliptical), and a perimeter enrichment of leaves or anthemia (not shown).



ELECTRIC SPECS

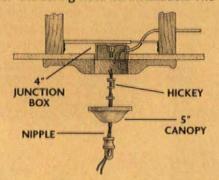
Before about 1820, light fixtures were simply hung from hooks attached to ceiling joists. You'll need to specify some sort of anchoring framework in the ceiling. Originally, plaster would be shaped around the hook - most typically, plaster balls resembling seeds ringed it. With the advent of gaslight and then electric light, medallions were designed for the service feed.

Today, electrical codes require that the junction box be accessible, so specify a removable canopy. This can be cast plaster or a metal piece that comes with the light fixture.

The standard canopy is 5" in diameter with a 1" shouldered hole for power lines to the chandelier. If you go with a cast plaster canopy, make an extra because these are prone to falls during electrical installation. The

medallion's center hole must be slightly more than 4" to cover the box; if it comes out too small, it can be opened with a rasp.

> The hickey attaches the nipple, which supports the canopy and the chandelier, to the electrical box.





This medallion has 16 enrichments, so my shopmade protractor has 16 lines.

surface is too slippery, the plaster may move. And if that happens, you'll have to scrap the run moulding and start over. I use a separator that I make myself. It's a combination of kerosene and stearene (available from hobby shops that sell candle-making supplies). Boil the kerosene in a double boiler and melt the granulated stearene into it. Let it cool, and paint it on the worktable. (See "Gelatine Molds for Plaster Casting," Jan./Feb. 1995 OHJ for more about making separators.)

If you're spinning a surround in place, first scarify (scratch) the ceiling so it'll have a mechanical bond. Then paint it with polyvinyl acetate (a bonding agent sold under various names, such as Plasterweld). It blocks moisture absorption and improves adhesion. For added security, drive galvanized bugle-head screws into the ceiling and leave the heads exposed where the plaster will go. Trowel equal parts lime putty and plaster and add a powdered retarder to slow the setting process. This produces thick enough plaster to stay put. while allowing you time to work before it sets. (Wear rubber gloves when working with lime.)

Gluing Up Medallions

THE CEILING WILL DETERMINE WHAT KIND of adhesive to use. If it's lath and plaster, a simple gypsum plaster is the best glue. (Make sure three-coat plaster is strong and lath is firm or the added weight of a medallion could be disastrous.) In the case of drywall ceilings, the paper surface inhibits plaster adhesion. So use white glue mixed with just enough plaster to thicken it so it fills voids. The mixture should be the consistency of sour cream; I have never measured, but it's probably 10 to 20 percent plaster, the rest glue.



Make sure to get a good, thick coat of adhesive on the back of the run surround.



Ideally, screws should be located where enrichments will be applied to cover them.



Apply plaster to seams with a paint brush as you might caulk around wood mouldings.

Construction adhesive is another good option for drywall ceilings, but it takes longer to set. It therefore requires fastening the medallion with screws - not a bad precaution with any adhesive, especially on drywall ceilings.

Predrill holes in the disk and countersink them to receive galvanized, buglehead deck screws. Unlike predrilling for screws in wood members, these holes should be sized larger than the screw shanks so the threads will pass without grabbing. Otherwise, the screw may crack the plaster. Drill pilot holes at slight angles (say, 5 to 10

degrees) so the mold will not loosen if the

screw releases slightly. Where there is no solid nailing behind the drywall, toggle bolts are an option.

For an existing ceiling, remove paint so that plaster meets plaster or clean drywall. Scarify plaster ceilings. Paint adhesive on the back of the disk, and press the

ornament in place, aligning it with the chalk marks and over the electrical box. Then remove it. Inspect the adhesive for complete coverage and let it set briefly so the piece sticks quickly when reapplied. Finally, put the medallion in place and drive screws into the predrilled locations. A variable speed drill is a necessity. Fill uncovered screw heads with a thinned plaster mix before finishing.

Fastening Enrichments

HISTORICALLY, ENRICHMENTS WERE SOAKED in water before mounting to prevent the plaster from drawing the water out of the adhesive. However, modern bonding agents block moisture migration so the enrichments need not be saturated. Paint polyvinyl acetate on and allow to dry. It strengthens the bond, decreases the weight of the enrichment by one-third, and allows the painter to begin work sooner.

The trick to installing enrichments is placing them correctly. To ensure that they are spaced equally around the 360-degree surround, I make a protractor from a piece of Masonite or cardboard. Cut a circle of the needed size and paint it white. Place a hole in the exact center and, using plane geometry, draw radiating lines for the center of each enrichment. When it's time to apply the enrichments, transfer the marks to the surround. Make sure the first line rides the chalk line from the chimney breast or wall. To space enrichments equally from the midpoint, cut another layout disk (this one must be an accurate circle) to the radius the enrichments are to be distanced from the midpoint. Either trace it or fasten it temporarily and place the enrichments against it.

Plaster is the best glue for attaching enrichments to the run surround. For enrichments outside the perimeter, use whatever is appropriate for the ceiling surface. Score both the ornament and the surface

> location. I slather a piece, stick it up and remove it and set it aside. Then I move to the next piece, and so on.

Suppliers

STANLEY TOOLS/ GOLDBLATT 600 Myrtle St. Dept. OHJ New Britain, CT 06053 (203) 225-5111 Plasterer's tools.

UNITED STATES GYPSUM P.O. Box 6721 Dept. OHJ Chicago, IL 60680 (312) 606-4000 Plaster, bonding agents, molding supplies.

SMOOTH-ON INC. 1000 Valley Road Dept. OHJ Gillette, NJ 07933 (908) 647-5800 Rubber molding supplies.



Once four or five pieces are glued and have thickened slightly, I return and attach them in order.

The medallion can be polychromed, gilded, or painted. With a reproduction medallion in place, your parlor, dining room, or living room will once again have its original glory.

David Flaharty is a sculptor and ornamental plasterer based near Philadelphia. His credits include the Metropolitan Museum of Art, the U.S. State Department, and the White House. He can be reached at 1064 Magazine Road, Green Lane, PA 18054; (215) 234-8242.

ABOVE: The last enrichments I apply are the leaves which ring the canopy. INSET: Push the plaster-andglue adhesive into the scarified enrichment.



ADDING A STRUCTURAL SKELETON TO AN ARTS & CRAFTS LANDMARK

CRAFTSMAN OF STEEL By Nancy Strathearn

Of the 200 house plans published in *The Craftsman*, the 1911 log cabin at Craftsman Farms was Gustav Stickley's pet project and ultimately his home.

for Craftsman Farms were not overly complicated. Phase One called for reconditioning the terra-cotta "shingle" roof, which was leaking badly, and structural repair of the sagging kitchen roof. Yet anyone who has worked on old houses knows no project is as simple as it appears. Gustav Stickley's ultimate log cabin and former home soon pre-

sented its own version of the "mushroom factor." As the architectural firm Holt Morgan Russell investigated the building for a set of drawings, they discovered a major structural problem.

The roofs of the two shed dormers on the main building were supported in a precarious way. Instead of resting on loadbearing walls, their weight bore on the log beams carrying the second floor, and at



nearly the midpoints of the 13' span over the porch and dining room (see drawing below). Moreover, many of these joists had been mortised out by the electrician who installed the original ceiling fixtures — right at the log bottoms where the greatest stresses occur. After 80 years of shouldering a very heavy tile roof and many winters of snow, one log beam had developed a dangerous stress fracture. The fear was that the remaining logs would soon follow suit.

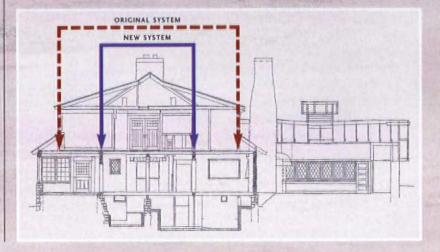
Faced with this new information, the roof restoration project soon grew in scope to correct the two structural problems — the sagging kitchen roof and the ill-supported dormers. The Township trustees of Craftsman Farms considered temporary supports, new visible columns in the wonderfully open downstairs rooms, and several structural materials. After debating the merits of each with state officials, the trustees elected a solution that was complicated to construct and time-consuming to execute, but would be a hidden and permanent solution.

Here's how we added a steel skeleton in the concealed parts of the building.

I. In the Kitchen

to blame for the deep bellies in each side of the kitchen roof. Over the years they had inserted junction boxes at numerous spots, weakening the rafters so they sank uniformly

A survey showed the dormers suspended by log beams (red); new steel placed the load over existing walls (blue).





ABOVE: The kitchen rafters had spread worst at the middle of the roof - so much so that they affected how the roof tiles drained. Sistering with 3 x 8 lumber reinforced each rafter with identical material, but was not intended to correct the sag. INSET: The sisters stopped short of the original rafter tails, which were restored with epoxy fillers.

in two large depressions. The failing rafters only exacerbated the sagging roof ridge. Here the cross ties had been placed too high in the 1911 construction (to provide for a lovely lofty ceiling in the large kitchen, perhaps), and they could not stop the rafters from spreading at the eaves.

To stabilize the depressions, the contractors chose to sister each of the damaged rafters with two new 3x8s. In sistering, identical members are attached to either side of

a weak rafter or floor joist to increase its strength. Since the original shingle tiles had been carefully removed as part of the reroofing, it was easy and logical to take up the decking in order to get at the rafters. (This also preserved the ceiling finish in the kitchen). Fitting the sisters was simple too because the original rafters did not extend beyond the wall plate, due to the exposed Arts & Craftsstyle eaves. The sisters were nailed to the rafters in a staggered pattern using 6" spikes.

The ridge sag, however, required shifting to another material. By cutting a 4' square opening in the wood-frame gable

> end of the kitchen, the contractors gained access to the small "attic" crawlspace above the ceiling. Attaching a chain hoist to the ridge beam, they were able to lift the custom-made. steel beam off a truck and into the gable opening. Though this single piece of steel weighed in at about 1,100 lbs. for the 30' span, materials such as glue-laminated beams and engi-

neered lumber would have been too massive to work with.

The beam had to support not only the roof ridge, but its own weight, so solid an-

The Craftsman Saga

USTAV STICKLEY IS BEST KNOWN AS A MANUFACTURER of plain, durable furniture that is often called "mission style" today. Yet, he was also a prominent and vocal proponent of the Arts & Crafts movement at the beginning of this century. Through his magazine, The Craftsman, Stickley reached homeowners across the continent, spreading the ideas of leading reformers and philosophers of the day - not to mention

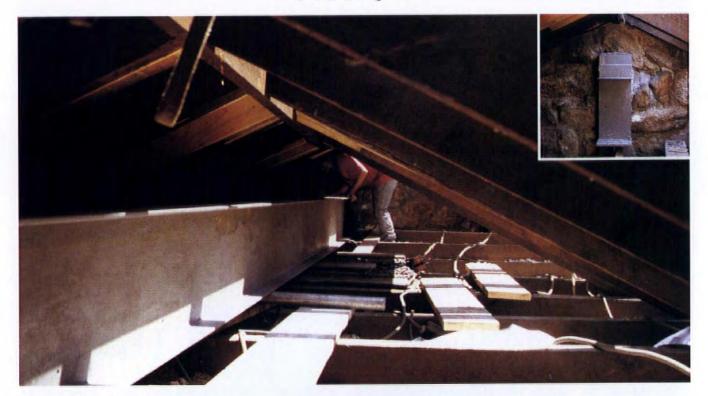
his own beliefs and the appeal of his furniture. In 1908, Stickley first wrote about his vision to create a farm school for boys who would raise the food they ate and sell the fruits of their labors. By 1910, he had acquired nearly 650 acres in Morris Plains, New Jersey (now the suburb of Parsippany) for his school. The focal point of the farm was to be a log-and-frame build-

ing, described in The Craftsman as a clubhouse and communal meal hall. However, by 1911, the cabin's floor plan had been altered to become Stickley's family home.

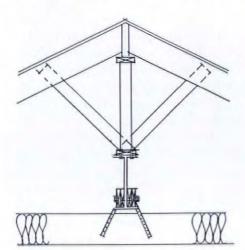
The plans for the school were never realized. Changing tastes and extended business ventures overtook Stickley; he declared bankruptcy in 1915. Two years later he

> lost Craftsman Farms as well. After a bankruptcy sale, the property remained in the same family for 70 years until the Township of Parsippany-Troy Hills purchased what remained of the farm — a 26-acre parcel including seven buildings and the main house — to stop a planned development. Shortly

thereafter, Craftsman Farms was designated a National Historic Landmark. Today the Craftsman Farms Foundation manages the main house as a museum and oversees its restoration. Stickley left Craftsman Farms after a too-brief tenure, but visitors still feel his hand in its creation.



chors were critical. On gable side, the kitchen ended in a stone wall - a substantial and welcome point on which to pour a two-foot-high concrete footing. Opposite this, the kitchen met the main building in a rubble-stone chimney. "Normally you can't bear on a chimney," notes architect Robert Russell, "but at 6' by 10' this was no ordinary chimney." The contractors cut a Tshaped slot in the masonry to receive a hanging plate. The plate was bedded to



On top of the beam, braces at each rafter provide support up to the old ridge. Structural metal connectors below the beam attach to the collar ties and add more support by "hanging" the rafters.

TOP PHOTO: Pipes made quick work of rolling the 30' steel beam into the kitchen attic. A wood beam would have been impractical in this confined space. INSET: Behind the custom-fabricated plate is a horizontal shelf cut and grouted into the massive chimney so that it can support the steel.

the irregular surface with high-strength, non-shrink grout, so that it bore fully on the enormous chimney. After hoisting and bolting the steel into place, a small cripple stud wall between the top of the steel and the bottom of the existing ridge board accommodated the sag.

Once installed, the new steel beam effectively took over support of the roof and relieved the sagging ridge of its weight. When the deck was closed up and the roof retiled, the sag had not disappeared, but it was only an eccentricity - not an ongoing problem. This portion of the job took five steel men and about a day of work just an opening act for what was to come.

II. The Unmoored Dormers

CORRECTING THE DORMER PROBLEM ON the main house was a lot more complex. The challenge was to transfer their support to some load-bearing portion of the first floor. The log walls on either side of the living room were perfect candidates since

Why Steel?

Structural steel is the material of choice for spanning large areas. The metal alone is roughly 15 times stronger than wood and 20 times more resistant to deflection (bending). A steel beam is also a more efficient shape than a wood beam. In a steel



STEEL

WOOD

I-beam, H-beam, or wideflange beam, it's the top and bottom flanges that are put in tension and compression when under load: the center web merely holds them together. In a wood beam, the top and bottom surfaces work the same as flanges, but nearly 50% of material does nothing except add weight and volume.



ABOVE: An attic vent window (above worker in photo) provides a way into the main building for the dormer steel. INSET: More pipes position the steel once inside. BELOW: Now in place, one two-piece dormer beam is connected to the the existing framing by cripples and fasteners.

both rested on stone walls in the basement.

The contractors started in the second floor of the main building. On the west side, they broke through two different frame walls, carefully removing and saving each layer of historic finish for reinstallation. This doesn't sound like a big deal until you grasp the turn-of-the-century products Stickley chose for his home. The walls were 1x6 tongue-and-groove planks laid diagonally on both sides of the studding. Over these were 34" x 44" blocks of cardboardlike material — possibly Upson Board. The final covering was grass cloth in some bedrooms, canvas cloth in others, and ceramic tiles in one of the bathrooms.

The carpenters opened these walls to create chases, voids no wider than the 14" between studs and long enough to receive three 3" x 3" steel tube columns designed to carry the load down to the first floor. However, when the same procedure was tried on the east side of the house, the configuration of the walls got in the way. Instead, it took two two-piece columns, bolted together to make the full 9' height. Each column fit into a steel cup at its bottom, which in turn was bolted to the top of the first-floor log walls. At the tops of the columns, more cups were welded to plates that came flush with the attic floor.

The day the beams arrived, the pieces of the puzzle came together quickly. Using a small vent window as access through the stone gable wall, the contractors slid four sections of steel beam into the attic, rolling them into position over the column tops at either side of the space. When the sections



were bolted together, they formed two 35' beams that ran the length of the attic.

The idea, of course, was to shift the weight of the dormer roofs onto the steel beams. The beams, in turn, were bolted to the steel tube columns, which stood on top of log walls, which rested on thick stone foundation walls. Cantilever loads were a welcome by-product of the column locations. Since the beams are supported a couple of feet in from each end, the "outboard" loads offset some of the "inboard" loads, and help keep the beam sizes at a minimum.

III. Portals of Problems

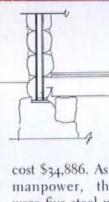
ONE HITCH REMAINED. THE EAST LOG WALL between the porch and the living room is punctured by two large doorways - as luck

would have it, directly beneath the new tube columns. Since these openings left only two "header" logs to support the columns, rather than the complete wall of 17 logs, the support system had to be further engineered around the doorways. The solution turned out to be more tube columns.

After removing the doorway frames and casings, the contractors proceeded to dig out chases in the log butts on both sides of each opening and the header logs above. As frightening to see as it sounds, they worked deftly with chain saws and circular saws to groove the logs, finishing up with chisels. When

vertical tubes on either side were bolted to flanged lintel plates inserted in the headers, they formed steel portals set inside the logs. After the door frames were set back in the openings, none of the reinforcement could be seen.

The last structural step took place back in the attic. After the steel was in place, the carpenters installed blocking and cripple studs between the top of the steel and the dormer rafters, thereby relieving much of the load from the porch and dining room log joists. The second-floor walls were closed up using the original materials, so that it is almost impossible to detect where the chases are. The final numbers on this work are hard to separate from the other phases of the restoration, but the total steel project was estimated to



cost \$34,886. As for manpower, there were five steel men who installed the beams; two carpen-

ters connected the steel to the roof and worked on the chases.

So, using steel reinforcement that can't be seen, we have practically eliminated the chances for structural failure in a house with "honest" but shortsighted construction. The new roof wasn't put to much of a test during this past mild winter, but we feel more secure now that rain won't bring leaks, and we can allow normal visitor traffic again.

Knowing that Stickley designed this house at Craftsman Farms, architect Phil Holt remarks, "As an architect, Stickley was a fine furniture maker." The house is remarkable nonetheless, and restoration of the aesthetic finishes and mechanical systems lays ahead. With some trepidation, we wait to see what new problems will come to light at that time.

"Secret steel" preserved the historic appearance of the living spaces. Careful channeling of the solid log doorways hid the steel lintels (left) and columns (below right). Tube columns (below left), 3" square and assembled from two pieces, fit within the second-floor stud walls.

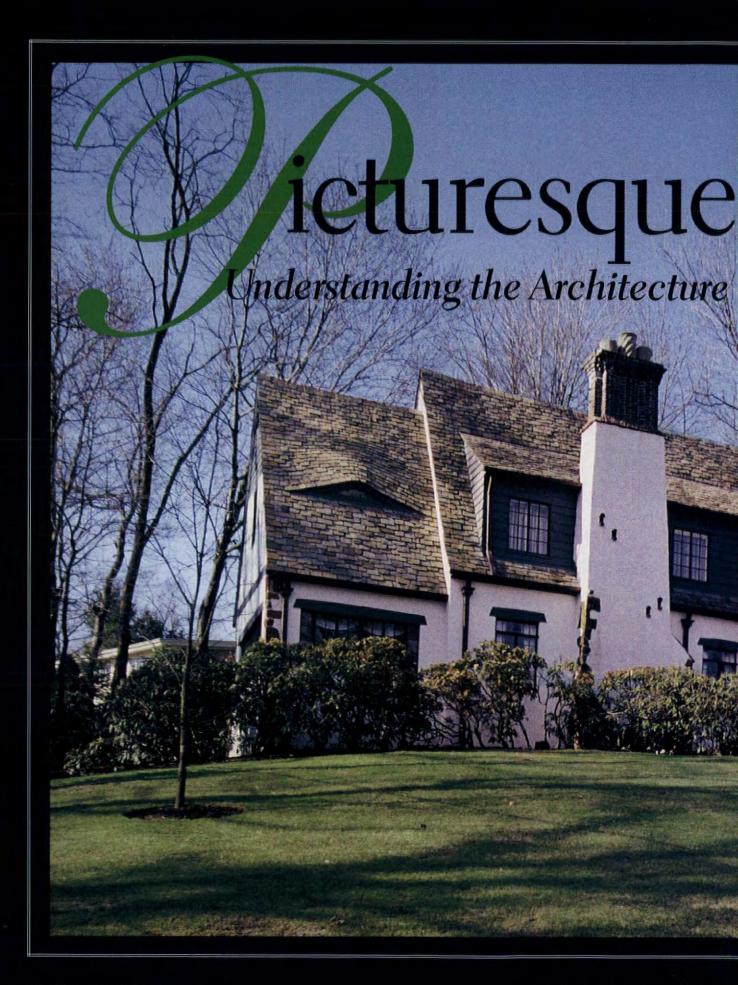
Adding Steel to Wood

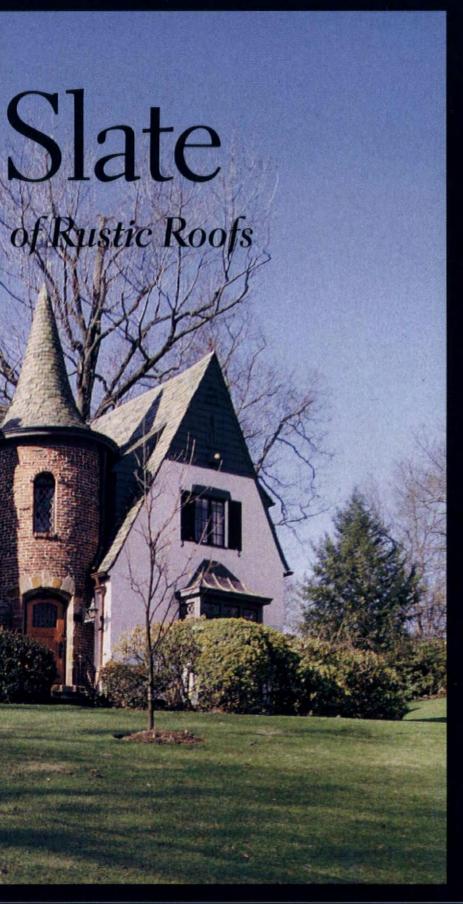
Steel may be strong, but it is not a structural panacea for older wood buildings. Issues such as these must be weighed before reinforcing with steel:

ACTION OF DISSIMILAR MATERIALS - Steel and wood respond differently to changes in temperature, moisture, and load. For example, wood bends more than steel, so under changing loads the materials may pull apart where they are joined.

CONDENSATION - Indoor climate conditions can cause moisture to condense on steel, especially where there are HVAC systems. Collecting water may damage wood, often at fasteners.

LOSS OF EVIDENCE -Particularly in historically significant houses, wood structural systems are examples of early building engineering. Swapping original beams and supports for modern materials can obliterate this record. "Try to use steel as a redundant system rather than as a replacement system," suggests Thomas Visser of the University of Vermont Historic Preservation Program.





our any early-20th-century neighborhood and you'll soon notice that Tudoresque, French Revival, and so-called cottage-style homes are quick to feign an antique, timeworn appearance. Battered walls, sagging ridge lines, pseudo half-timbering, and quaint masonry are only a few of the architects' devices employed for the feel of instant age. You're also bound to note some rugged-looking slate roofs — random colors, thicknesses, and sizes, all in an awkward mix. Were these rustic roofs the work of amateur slaters? No indeed, quite the opposite. A Contrary to what meets the eye, architectural slate roofs, as the industry calls them, were carefully planned by architects, slate companies, and skilled roofers to create a surface that was anything but uniform. Though architectural roofs are still produced by traditional roofers and slate companies today,

BY J. RANDALL COTTON

Inspired by Normandy farmhouses, English Cotswold cottages, and perhaps the Hansel & Gretel fairy tale, romantic revival houses of the 1920s and 1930s are skillful combinations of medievalesque features — chief among them deliberately haphazard slate roofs.



Specifying staggered butts, staggered exposure, and clipped corners can take the textural roof to an extreme level, producing a crazy guilt of slates.

Textural roofs scramble slate thicknesses, lengths, widths, and colors in combinations that can be specified for any one of many rustic looks. The effect is most often seen on average slopes; steep roofs and towers tend to look "cut up."

many homeowners and craftspeople are unaware of the inventive and cunning specifications that underlie them. If your old house is topped by a rustic slate roof, chances are it's original and in service close to 70 years. For its best upkeep and restoration, here's what you'll need to know about how these deceptively primitive, but delightfully eccentric roofs, were put together.

The Styles of Slate

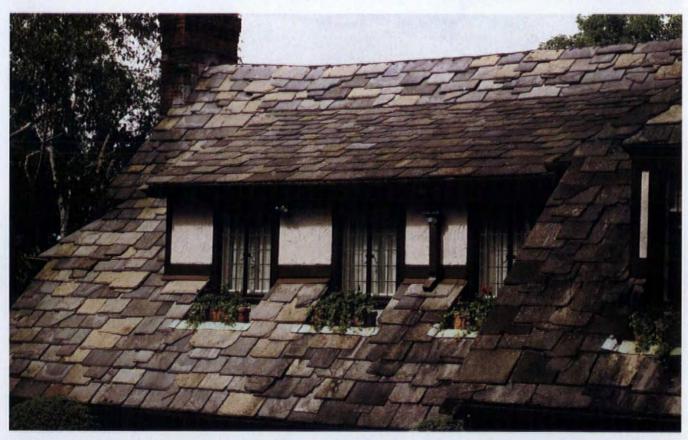
THE ARCHITECTURAL SLATE OF THE EARLY-20th century represented quite a shift in effect from roofing in the preceding Victorian era. Not that the Victorians didn't turn their flat, smooth, regular, and neatly trimmed slate to decorative uses. In fact, the golden age of the polychrome, patterned slate roof blossomed in the latter half of the 10th century. Combining contrasting colors with a variety of neat, overlapping, fancy-cut butts created striking geometric roof patterns. These diamond, hexagonal, wavy, fish-scale, or staggered designs - called imbrication - were favorites on Gothic Revival, Italianate, and Oueen Anne houses.

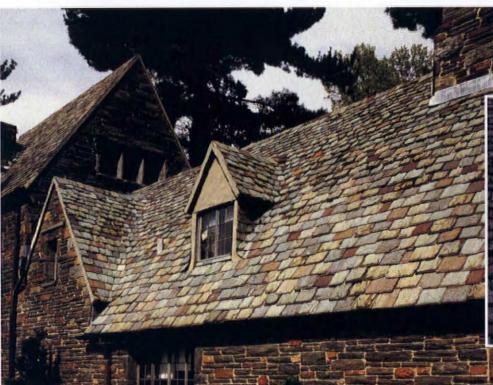
Architectural slate, on the other hand, based its look on being random-width and heavily textured. One quarry promised slates "so intermingled and weathered that a newly laid roof has all the aged appearance that is characteristic of the roofs on the ancient castles and homes in England." Another described architectural slates as having "random lengths and widths, and promiscuous thicknesses." Evocative trade names such as Old English Cleft, Thatchslate, Olde Stonesfield, Rough Cleft, Tudor Stone, Antique, and Rustic Mohawk hammered home the intent for a buying public.

If a Victorian-era patterned slate roof can be compared to the complex and crisp delineation of a computer-generated drawing, then the architectural slate roofs of post-Victorian homes resemble a freehand sketch: rough at the edges, coarse, and seemingly unrefined, but also enchanting and romantic.

Textural Slate Roofs

ESSENTIAL TO THE LOOK OF ANY SLATE ROOF is the material itself. Standard slates are uniform in size, color, and thickness (commonly 3/6"); they also have a smooth surface. Architectural slates vary in some or all of these characteristics within a single roof. For re-





LEFT: Graduated roofs reduce the slate thickness as the courses approach the ridge. BELOW: Slates over 1" at the butt often begin the graduated roof.



vival-style roofs there are two types: textural slate and graduated slate.

According to Slate Roofs, the 1926 publication still considered the slater's "bible." textural slates are "usually of rougher texture than the Standard, with uneven tails or butts and with variations of thickness or size." Textural slates were - and still are guarried in thicknesses from 1/6" to 1/8", and lengths from 12" to 20". Variations in width, length, and thickness dimensions are scattered evenly throughout the roof, from eave to ridge, often matching one of the following schemes:

- Slate length is constant, thickness and width vary
- ▶ Slate thickness is constant, length and exposure vary
- Slate width is constant, length and thickness vary

A textural slate roof will have a range of colors scattered evenly across the surface, although a single color predominates. For example, one common mix is a background blue-black slate, with lesser numbers of greys, black-greys, and occasional purples. Period advertising described the overall effect as "a beautiful tapestry." Mixing in a sampling of buff, bronze, or opal freak slates (see page 55) resulted in a roof resembling "autumn foliage."

Many slate companies offered textural slate in several standard combinations. However, slate could also be ordered by specifying each of the various parameters for a comparatively unique roof. Before you begin to restore or replicate a textural slate roof, carefully study and record its features so the slate supplier can tell if it is one of the stan-

Stats on Slate

Slate is a metamorphic rock that has been transformed from shale by enormous underground forces of heat and pressure. One of slate's chief characteristics is its ability to split into thin sheets along natural cleft lines. It's durable and resistant to acids as well, so it's the basis for a long tradition as a roofing material. However, slate is also very attractive, with a color range of blacks, dark greys, reds, purples, and greens.

The first slate quarry in North America is thought to have been at Peach Bottom, Pennsylvania, which produced roofing as early as the mid-1700s. The heyday of slate production was from the mid-1800s to the

Victorians coveted slate's capability for crisp patterns and brought it to new prominence.

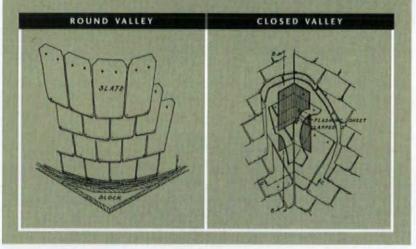
1930s when quarries in Vermont, New York, Pennsylvania, Virginia, and Georgia produced millions of slates for countless roofs.

Slate in the Valley

A valley is the depressed angle formed where two roof slopes meet. Most garden variety slate and shingle roofs are laid with open valleys - that is, the sheet metal flashing is exposed and the shingles or slates lap over on either side. Architectural slate roofs, however, use more picturesque closed or round valleys to enhance their fluid irregularity. In a closed valley, the slate is worked tightly across the angle, interweaving pieces of metal as flashing.

The round valley is perhaps the most appropriate for textural and graduated slate roofs. It creates a pleasing, nearly seamless, curved transition between the two intersecting roof slopes. The drawback to a round valley is its complexity. In order to construct a round valley, the roof has to be framed and decked so that it creates the general dished contour.

One method often used is a series of 3" nailing blocks, cut to fit the valley curvature and spaced 20" to 30" apart. Tapered strips, 1/8" x 3", are then laid lengthwise in the valley and nailed to the blocks - no work for amateur or inexperienced roofers. The slate used in round valleys is tapered at the edges to fit the radius of the valley, and must be 4" longer that the slates used in the corresponding courses on the roof.



REFERENCE

Slate Roofs, published in 1926 by the National Slate Association, is still an excellent resource and can be purchased from Vermont Structural Slate Company (see Suppliers, page 55).

dards (photos always help). Specifications will also spell out the following:

THICKNESS — Typically 1/6" to 3/6", but you may also state the percentages of thickness. For example, 10% of 1" thickness, 15% of 34", 20% of 1/2", and so on.

COLOR - Predominating color, color mixture, permanent or weathering.

GRADE — Today slate is graded as S₁ (a serviceable life of 75 to 100 years), S2 (40 to 75 years), or S3 (20 to 40 years).

Graduated Slate Roofs

AS IF A TEXTURAL SLATE ROOF, WITH ALL ITS mixes of thickness, width, length, and color, weren't creative enough, the graduated slate roof adds another twist to the same materials. In these roofs, the longest and thickest slates are placed at the eaves and they "gradually diminish in size and thickness until the ridges are reached," according to Slate Roofs. Graduated roofs emulate medieval European slate roofs, which used slates that were quarried without standardizing size or thickness.

As with textural slate, the slate company would provide graduated slate in the necessary mix of thicknesses, widths, lengths, and colors. Typical thicknesses ranged from a modest 1/4" to a beefy 1 1/2" - even behemoths 2" were sometimes used. Lengths ran from 12" to 24". Widths and colors were random but, again, a predominant "field" color was usually specified.

The chief characteristic of a graduated roof, however, was the way the slates diminished in size up the roof. Exposure might be 10 1/2" at the eave, and shrink to only 5 ½" at the ridge. Occasional slates of varying thicknesses in the same course added more spice to an already irregular roof. Slate thicknesses might even be graduated side to side. Important specifications for a graduated roof are as follows:

THICKNESS - The variation in inches from eave to ridge has to be set. Typically, thicknesses are also intermingled in the various courses, with the heavier and thicker slates concentrated in the lower courses and the thinner slates at the ridge.

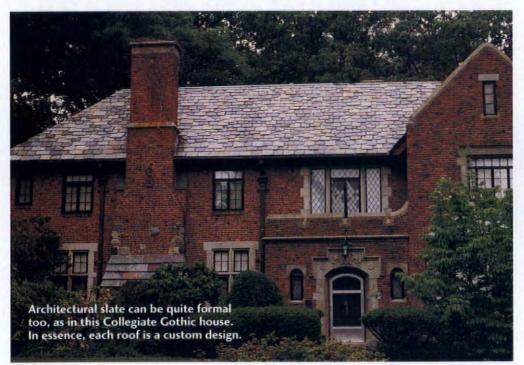
LAYOUT — Traditionally, quarries supplied a detailed roof layout for the job, to be approved by the architect, before the slate order was put together.

LENGTH — The graduation of the exposure from eave to ridge must be determined, including a standard 3" head lap.

Restoring and Replacing Architectural Slate Roofs

WHEN A TEXTURAL OR GRADUATED ROOF needs to be repaired or replaced, their complexity almost demands the services of an experienced slater, and probably an architect familiar with these roofs. Still, there's a lot educated restorers can do toward maintaining the health of their slate roofs.

WATCH THE SLATE - Although slate is very long-lasting, it will eventually deteriorate. Signs of failing slate are cracks, exfoliation, or scaling along the cleavage planes.



Lightly tap suspect slate with a mallet: if it gives a dull thud, the slate's probably shot. WATCH THE UNDERLAYMENT - It's common to replace roofing felt in slate roof restoration. Felt underlayment not only provides a temporary weather shield before the slate is laid, it cushions the slate

Slate Colors

Slate is quarried in a range of colors from black to reds and greens. Though slate is naturally grey, the presence of minerals increases the palette - for example, iron oxide for red, or chlorite for green. Two types of slate are available: "unfading," which will remain colorfast, and "weathering," which fades with time. Because it adds to an aged look, weathering slate is common in architectural slate roofs. The basic slate colors are: black; blueblack; dark, light, and silver greys; blue-grey; light and dark purple; mottled purple and green; green and greygreen; red; and variegated purple.

Also available are freaks, which were often interspersed in architectural slate roofs. Freaks, sometimes called rustics, are usually splotched with brown tones, such as buff, bronze, or opal.

and adds protection against driving rain and snow. Use at least 30 lb. asphalt-saturated rag felt for slate up to 1" thick; 50 lb. felt for slate over 1" thick.

WATCH THE FASTENERS — Original iron nails are the Achilles' heels of older slate roofs. When they rust away, slates that are sound in other respects can fall out and start leaks. Nowadays, copper or stainless steel nails are preferred, especially those with ringed shanks that resist pull-out (zinc-coated steel and brass nails are also used). Slate nail length should be two times the thickness of the slate plus one inch.

RECYCLE SLATE — A general rule of thumb says that when 20% of the slates in a roof are failing, it's probably more economical to replace the entire roof. However, bear in mind that many old slates may be salvageable for future use. This is especially true for architectural slate. Their random dimensions and colors make them difficult to duplicate with stock replacements. In any event, document the old roof with photos and a written description to aid slate companies in matching replacement slates.

Like so many early-20th-century roofs, architectural slate is a character-defining feature that is expensive to duplicate today. Understanding how their mock-medieval effects work will keep them on old houses well into the 21st century.

Suppliers

DURABLE SLATE CO. 1050 N. Fourth St. Dept. OHJ Columbus, OH 43201 (800) 666-7445

EVERGREEN SLATE CO., INC. 68 Potter Ave. P.O. Box 248, Dept. OHI Granville, NY 12832-0248 (518) 642-2530

NEW ENGLAND SLATE CO. **Burr Pond Road** Dept. OHJ Sudbury, VT 05733 (802) 247-8809

NEWFOUNDLAND SLATE, INC. 8800 Sheppard Ave. E Dept. OHJ Scarborough, ON M1B5R4 (416) 281-8181

RISING AND NELSON SLATE CO. Main St. P.O. Box 98, Dept. OHJ West Pawlet, VT 05775 (802) 645-0150

STRUCTURAL SLATE CO. 222 E. Main St. P.O. Box 187, Dept. OHJ Pen Argyl, PA 18072 (215) 863-4141

VERMONT STRUCTURAL SLATE CO., INC. 3 Prospect St. P.O. Box 98, Dept. OHJ Fair Haven, VT 05743 (802) 265-4933



"Old English No. 12," was just one standard slate combination used in the 1920s.

A creative alternative to the general contractor keeps costs down and lets old-house owners stay more involved in their large construction projects. If disputes arise, though, the homeowner could be stuck with big headaches. By Josh Garskof

ABOVE: Construction managers oversee the tradespeople but do not hire them. BELOW: Even for small-scale work, old houses often require multiple specialists.



HEN SUZANNE O'CONNELL AND TOM Christopher decided to remodel the kitchen in their old Connecticut Cape, they hoped to keep their role minimal. They'd find a good general contractor and write the check. But then they started planning counter layouts and cabinet designs and realized they needed to be involved and to make decisions as the work progressed.

Problem was, the contractors who came to see the job wanted to define the scope of the work and set a price up front, leaving less flexibility than the couple envisioned. The one person who was willing to work on their terms is not a contractor. He is a construction manager — a consultant who oversees the job while the homeowners hire the tradespeople themselves.

Professional Managers

CONSTRUCTION MANAGEMENT HAS BECOME an alternative to general contracting for big old-house projects. It's cheaper and it allows owners to be their own general contractors, while keeping a set of professional eyes on the job. But the arrangement also has potential pitfalls that can get homeowners in over their heads.

Traditionally, when old-house owners need professional help, they hire a general contractor for a total package price. The general contractor pays a crew of carpenters and laborers, hires independent subcontractors for specialized work (such as mechanical services), and buys materials.

Construction managers, however, do not hire subcontractors or buy materials. They are consultants to the homeowners who become the general contractor, signing prime contracts with each company that works on the job. The construction manager typically analyzes cost, recommends tradespeople, schedules the workflow, and oversees the project. Some managers also perform general carpentry; others specialize in

"Construction management is like ordering a la carte. You pick your entrée, side dishes, appetizer, and dessert. General contracting is like ordering the special." - MARK BRADY, MIDDLETOWN, CONN.

searching out restoration materials or researching old houses. (Sometimes, as we'll discuss later, homeowners hire both a construction manager and a general contractor.)

"Construction management is like ordering a la carte," says Mark Brady, the Middletown, Connecticut, construction manager Tom and Suzanne hired. "You pick your entrée, side dishes, appetizer, and dessert. General contracting is like ordering the special."

The system began in the late 1970s in the commercial construction sector, according to Jerry Householder, Chairman of the Department of Construction Management (the business of contracting) at Louisiana State University in Baton Rouge. Construction management peaked with the soaring interest rates of the early 1980s. Project owners wanted fast-track construction. The model allowed enough flexibility so work could begin before all the blueprints were finished, Householder says.

While the construction management boom has leveled off in the commercial sector, it appears to be growing in residential restoration and remodeling.

Finances and Flexibility

SMALL RESTORATION AND REMODELING COMpanies see real economic benefits to construction management. As general contractors, they must shuffle resources to pay subcontractors and their own crews before they bill for the work. It may not be until the final payments on a job that the general contractor earns any money. If the deal comes unglued, these checks may never come.

"Little contractors are not banks," says Brady. "So why should they be in the business of extending credit?"

As construction managers, they don't have to finance materials or subcontractors' expenses. The homeowner pays each company directly, so the most the manager can lose is payment for their own time. Plus, if the homeowner reneges on payments for a tradesperson's work, the short-changed party will sue the homeowner, not the construction manager. If, however, subcontractors don't get paid, they sue the general contractors, who may be liable even when the owner fails to pay them.

Why would a homeowner agree to the construction management framework? First and foremost. you can expect to pay less for the project with a construction manager than with a general contractor. The company is not marking up subcontractors' work or

materials. Because it is not taking on the risk of prepaying for, or guaranteeing, others' work, it typically does not require a large sum up front. The manager simply gets paid for the management service — an hourly rate, a flat fee, or a percentage of the project cost.

"Construction management is a particularly good model for restoration work," says Householder. "In an old house we don't know what we're going to run into until we open up the walls. The model is flexible enough to handle the unforeseen."

Beyond that, construction management sets the stage for more control and involvement by homeowners. They may handle portions of the work themselves — most



New construction on old houses requires many trades and someone to orchestrate the job.

GLOSSARY JOB

- BASIC SERVICES: The five standard elements of an architect's contract: schematic design, design development, construction documents, bidding or negotiation, and contract administration.
- CALL BACKS: A tradesperson's return visits to a job after completion to fix failing work or materials.
- CHANGE ORDERS: Amendments to a contract for a change in the work.
- CONSTRUCTION MANAGER (CM): A consultant who assists the homeowner with issues that may include cost analysis, scheduling, contract negotiations, purchasing of materials, and overall project coordination.
- ► GENERAL CONTRACTOR (GC): A company responsible for carrying out the

- construction project labor, subcontractors, and materials - as defined by the agreement.
- LUMP-SUM: A price that specifies a total, or an estimated total, for specific work.
- ► PRIME CONTRACTOR: A company that contracts directly with the home-
- PUNCH LIST: A list of unfinished or unsatisfactory work that must be completed before final payment.
- SUBCONTRACTOR: A company that contracts with the general contractor for a portion of the work.
- TIME-AND-MATERIALS: A flexible billing arrangement based on hours spent and items purchased, instead of a flat fee.

"Is the homeowner, who's got a busy life doing something else, going to save that much money by taking the time from their work to learn the construction trade?" — PAUL WINANS, OAKLAND, CALIF.

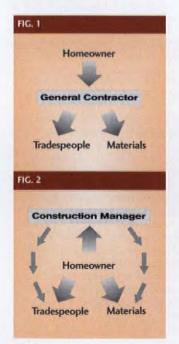
commonly demolition and painting. Meanwhile, they can watch what's going on and make decisions along the way. The con-

> struction manager is liaison between owners and tradespeople.

> "Because of Mark's diplomacy as a construction manager, we got what we wanted," says Christopher. "For example, we decided we wanted a peninsula in the kitchen, but the cabinetmaker thought it would be too crowded. So Mark cut a mock peninsula from plywood and we left it there while the work progressed, adjusting it until it was right." Once they proved that it worked, the cabinetmaker built it.



ABOVE: Many construction managers handle the carpentry work themselves. BELOW: The general contractor hires tradespeople and purchases materials (fig.1). The construction manager oversees the job, which is contracted by the homeowner (fig.2).



The Risk Factor

construction management, However, is not for everyone. We spoke to homeowners who wouldn't touch it with a 10' 2x6 because the construction manager is not totally accountable for the work. What if there is trouble — shoddy work, disappearing tradespeople, or *change-order* disputes? The homeowners may be on their own. A general contractor, though, guarantees the project, nailing down *punch list* items and handling *call backs* for subcontractors' work. If not, the legal recourse includes two possible lawsuits: against the tradesperson and against the contractor.

"General contractors are on the hot seat. We're responsible for, and stand behind, the entire project," says Christopher Walberg, of Chicago's Downstate Restorations.

Whether legally accountable or not, construction managers have to maintain their reputations, counters Mitchell. That means managers are careful to recommend reliable tradespeople. They use their clout — influence with the check-writing owner and recommendations on future jobs — to keep them in line.

"My business is based on happy

clients," says construction manager Jennifer Smith Mitchell, principal of Heritage Restoration, in Bozeman, Montana. "It's all about word of mouth. I may not be liable, but if the job falls apart, I look bad. You bet I'll follow through to make sure everything works."

Homeowner Christopher acknowledges that construction management left him a bit exposed. "But we weren't looking for the lowest bidders. We wanted quality, reputable, local craftsmen, and that's who we hired." These individuals are licensed and insured professionals themselves, he notes.

The best way homeowners can protect themselves when they hire a construction manager is with a well-written contract. It should spell out exactly what the manager's role and responsibilities will be. Householder recommends showing it to an attorney.

"The construction manager's contract should make sure the owner doesn't get left in the lurch," he says. "It should state that the construction manager is responsible for observing all the work and for overseeing the project as a representative of the owner's interest."

Contractors Wary

LOTS OF GENERAL CONTRACTORS WON'T get involved in construction management at all. This may be in part because the arrangement cuts into their potential earnings (they can charge more as contractors), but it's also because they feel the structure can be dangerously open-ended.

"Many times, a contractor will suggest construction management if the budget is uncertain or if the homeowners can't make up their minds," explains Bruce Curtis, president of Washtenaw Woodwrights, general contractors of Ann Arbor, Michigan. "I feel a lot more secure if the scope of the work is set before it begins."

Another potential problem with construction managers, according to Denver architect Doug Walter, is that because they do not hold the checkbook, they have less control of tradespeople than a contractor would.

"Unless the subs are looking to him for their money, it can be difficult for him to ef-

fectively manage the project," Walter says. The answer to this, according to Brady, is that the construction manager must sign off on work before the homeowner pays for it.

But some general contractors aren't convinced. Few homeowners have the jobsite experience to take on the responsibilities of a general contractor, says Walter.

"Is the homeowner, who's got a busy life doing something else, going to save that much money by taking the time from their work to learn the construction trade?" asks Paul Winans, a general contractor in Oakland, California. "Why not pay someone who's already been through the mill?" Winans Construction makes sure subs are properly insured and handles all tax forms.

So, what if a homeowner wants a general contractor but also wants involvement and flexibility? A good general contractor cooperates too. There are plenty who will let the homeowner bang a few nails or hold the end of a 2x10. Many will even tolerate design changes with a polite smile. And all of this comes - for a price - with the confidence that the entire project is in someone else's hands.

Hiring Both

SOME HOMEOWNERS - PERHAPS ON THEIR first old-house project or perhaps not a single owner, but a museum building board need more job oversight than either a general contractor or a construction manager can provide. They can hire both.

The manager, who is top dog in this project hierarchy, acts as the owner's advocate, making sure the specs are met and han-

dling surprises and problems.

"A third party can look at each situation in an unbiased way," says Dave Mathew, a construction manager and architect currently with the Troyer Group in Mishawaka, Indiana. "He's not paid by the contractor and he's not going to be living in the house."

"It's important," adds construction manager John Leeke, "especially on big projects, to have a distinction between the consultant, who is taking an integrated, whole-house approach to problems, and the hands-on workers."

Adding a construction manager's services to a project that will also have a general contractor can tack on 15 to 20 percent to the

Creative Pricing

Construction managers, and some general contractors, often recommend basing contracts on time-and-materials, also called cost-plus. In other words, instead of a lump-sum bid, the company bills the owner for the hours worked and the materials purchased (including a markup).

For jobs that are not fully outlined when the work starts, the arrangement allows the scope of the work to change without reworking contracts; it makes change orders unnecessary. Meanwhile, the carpenter or electrician doesn't have to guesstimate the cost of the project.

The downside for homeowners is that an unscrupulous contractor can use time-and-materials as a license to overcharge. Without a definitive project total, the work can be dragged out and the bill jacked up. The key to an effective time-and-materials arrangement is mutual trust.

overall budget. Critics call this a top-heavy team and a waste of money. But Leeke, whose second calling is as an OHJ contributing editor. notes that unforeseen problems are the rule

- not the exception in old-house work. He says that his investigation, planning, and oversight can save more than they cost.

Architect as Manager

FOR JOBS WITH BOTH a general contractor and an architect, the architect's basic services typically include limited con-

struction management services - about six hours per \$100,000 of work, according to Walter. An additional contract can put the architect, or the architect's staff, in a fullfledged construction management role. This makes sense given that the architect drew up the plans and wrote the specs.

Another option is to offset somewhat the cost of a construction manager by reducing the architect's responsibilities. (One hour of a manager's time comes cheaper than that of an architect's.)

There are lots of ways to set up a construction management job; the unorthodox system remains undefined until outlined by a specific contract.

It's too soon to say whether construction management is a bona fide trend in oldhouse restoration. It's clear, though, that the flexibility and involvement are just what some homeowners are looking for.



General contractors are legally responsible for all work on the project; construction managers are not.

THE STRIKING FACTS ABOUT

CHANCES ARE YOU'VE SEEN THEM IF YOU'VE EVER PULLED apart pieces of an old house. They're spiky and toothlike, with sharp edges but squared-off tips. Though they belong to an earlier generation of carpenters, they're still called "common." They're nails - cut nails, to be specific.

RUNNING FROM THE 1790S to the 1880s, the cut nail era is a bridge between the age of the handmade wrought nail and today's mass-produced wire nail reign. Cut nails were machine-made, uniform, and cheap, and they quickly became linchpins in the move away from labor-intensive construction, such as timber-framing and split-lath plaster. Far from footnotes, cut nails continue to be made in modern and traditional shapes that are practical for oldhouse restoration work. Moreover, historic cut nails can be surprising clues for shedding light on the past of old houses once you understand their finer points.

One way to see how important cut nails are is to look at nails in general over 300 years of North American housebuilding.

HANDWROUGHT NAILS - Nail making was part of the blacksmith's art until the end of the 18th century, and a well-organized trade in preindustrial England. Handwrought nails were sold at so many pence per hundred — the origin of the

"penny system" of grading. Until the Revolution, colonial Americans were big importers.

Despite their cost and scarcity, carpenters and cabinetmakers continued to use wrought nails well after they were obsolete because they could be

clinched. Since the iron fibers ran parallel to the length of the bar, the nails bent without breaking and were ideal for, say, locking together the parts of a board-and-batten door.

WIRE NAILS - The modern, mass-produced wire nail became common on this continent in the 1880s. The first machines in the 1850s and 1860s were capable of only small, light nails for installing decorative hardware or making cigar boxes. Once the Bessemer process made steel plentiful, wire nail proCut nails have some fasten-ating advantages over other nails:

- ► Blunt points punch through the wood fibers; wire nails pry - more likely to cause splitting.
- ► Sharp corners continue cutting as the nail moves.
- ► Tapered edges wedge the nail in the wood, compressing the fibers so they don't shrink and release the nail.
- ► Flat sides provide a large gripping surface. Cut nails carry on for special

purposes, such as nailing furring to masonry, installing flooring, timber construction, and restoration work.





duction advanced quickly into all areas of construction. In 1893, the wire nail drove past the cut nail in output and has not been surpassed.

cut nails —Cut nails stand apart from wrought or wire nails because they are sheared (cut) from iron or steel plate (see drawing, page 63). This process gives them square edges like a wrought nail, but only two tapered sides and a blunt point. Cut nail use did not die out instantly at the end of the last century, or without a fight. In the carpentry trade, the tug-of-war with wire nails raged for a good 20 years. "The relative value of these two kinds of nails," editorialized

Carpenter & Builder magazine in 1894, "is a matter on which builders are far from being satisfied."

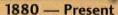
Researchers sometimes use cut nails (and other early nails) as archaeological evidence of age or alterations in an old house. As the technology for manufacturing cut nails improved, the nails themselves changed in subtle ways that correspond to general dates (see timeline, page 62). Dr. Henry C. Mercer was the first to recognize the value of historic nails for dating house changes in his 1923 monograph "The Dating of Old Houses."

Nail dating is a soft science, but quite revealing if the interpretation is kept within limits. Among the cranberry bogs that lead to the Cape Cod peninsula stands the Tremont Nail Company factory, the oldest manufacturer of nails in North America.

Much like patent dates on hardware, you can't rely on nail evidence as precise benchmarks. It's viable only for "post-dating," in other words, assuming the structure is no older than the nails. Local history (such as when railroads were available to bring new products) should be considered too. Compare nail samples from several parts of the building before drawing any conclusions. In fact, just finding similarities or differences in the nails can tell a story.

NAILS UP TO NOW

Nails have seen many changes in their evolution from wrought to wire, but the basic shapes and eras below are good for general dating.



Wire nails are made from steel wire by gripping the end to form a head (the source of the tooth marks in the upper shank), and then clipping off the nail to form a point.



1830 — Present

Nail taper is produced exclusively by flipping the strip; heads are machine-made without deforming the shank. Metal is now rolled so iron fibers run parallel to the length of the nail, making them stronger.



Early machine-made heads appear on both the above types of cut nails. The machine leaves distinctive "hips" in the nail where it grabs the shank to form the head.

1810 - 1820

The taper is produced by flipping the strip for each nail, a method that leaves shear burrs on same-side edges. Heads are still hand-hammered.

1790 - 1820

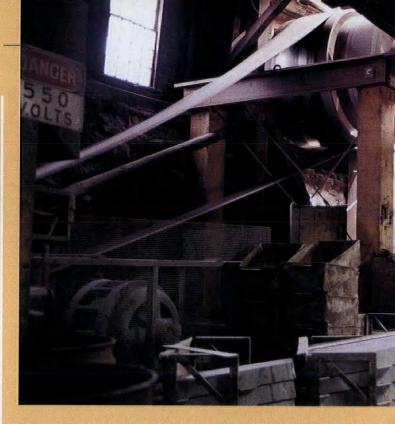
The earliest cut nails were made on machines akin to simple cutters, slicing nails from the same side of an iron strip. The operator shifted the strip side-to-side in order to give the nail taper and save iron. This process leaves distinctive shear burrs on diagonal edges.

Heads were added later by hand-hammering. Iron fibers ran across the length of the nail.



Antiquity — 1810

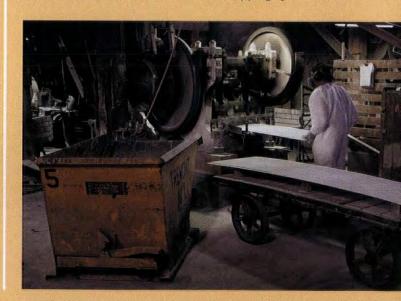
Handwrought nails started with a bar of wrought iron obtained from an iron works. The smith hammered out the bar to a thin point with four tapered sides. After breaking off the rough nail point at the desired length, he placed it in a special anvil and hammered on a head.

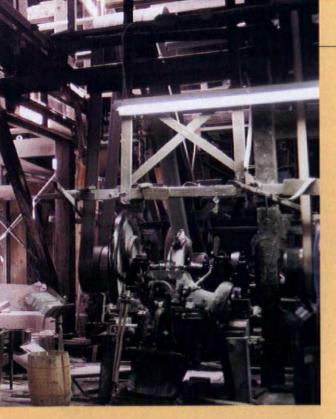


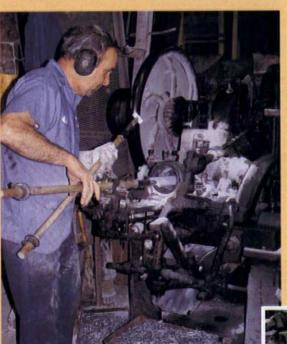
WE PAID A VISIT TO THE TREMONT NAIL COMPANY

in Wareham, Massachusetts, manufacturers of nails since 1819. Their plant is a step back in time, and a marvelous education in what puts the cut in cut nails.

V STEP 1: At Tremont, cut nails start out as 2' x 9' sheets of hot-rolled, high-carbon steel, cleaned and dusted with lye to lubricate them. Thickness varies according to the nail, from 0.080" for finishing nails to a very hefty 0.250" for spikes — essentially plate steel. The first step is to feed each sheet into a gigantic cutter that shears them into strips as wide as the nails will be long. Massive flywheels deliver the power from whirring overhead belts and smooth out the chopping cycle.





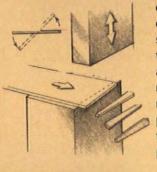


A STEP 2: One after another, the steel strips are next attached to long wooden sticks that feed them to the nail-making machines. Each 1870s-vintage machine is geared so it flops the strip back and forth, biting off a nail each time, three to five nails a second.

V STEP 4: Making hardened-steel nails, such as masonry nails and flooring nails, requires extra steps. First the nails are heat-treated to 2,000 degrees F in modern continuous ovens for increased strength, then quenched rapidly in a water bath. Afterwards they are tempered at 500 degrees to remove brittleness. The result is a nail hard enough to drive through steel.



■ V STEP 3: The heart of the machine is the moving head knife (photo below). This carbon-steel tool, sharpened like a wide chisel, cuts a nail each time it travels



down to the bed knife (see drawing). The steel strip (not shown) is held in position by the fingers, which cycle back and forth. At the same time a nail is cut, "nippers" grip the nail shank so that dies can press on a head. Afterwards, the finished nail drops into a pan at the feet of the machine.

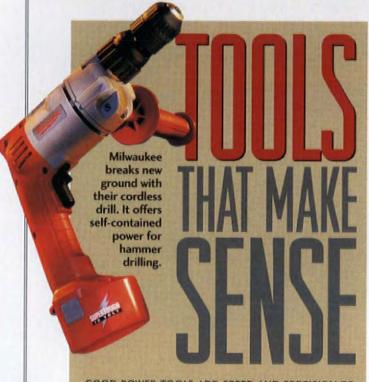
SUPPLIERS

TREMONT NAIL COMPANY P.O Box 111, Dept. OHJ Wareham, MA 02571 (508) 295-0038 Cut steel nails in 20 patterns for restoration, flooring, and masonry work.

LABELLE NAIL PLANT Wheeling Corrugating Company 31st and Wood St., Dept OHJ Wheeling, WV 26006 Cut steel nails in several types including stainless steel; contact for

distributor details.

RESTORATIO



GOOD POWER TOOLS ADD SPEED AND PRECISION TO OLD-HOUSE WORK, YET WHO HASN'T PICKED UP A SAW OR DRILL THAT'S A CHORE TO OPERATE? IT TAKES THOUGHTFUL DESIGN AND TIGHT ENGINEER-ING TO BUILD TOOLS THAT SUIT RESTORATION IOBS. HERE ARE SOME OF THE BEST RECENT INNOVATIONS.

HANDY HAMMER DRILL

IF YOU STILL THINK BATtery drills are toys, you haven't hit on the new cordless hammer drill from Milwaukee. Percussive drilling in materials like masonry takes power, and up until recently, you could only work as far as an electrical cord would allow. Milwaukee's Super-Tough Cordless Hammer Drill changes all that

with a Rare-Earth DC motor that the manufacturers sav makes this drill the

three models (depending upon the battery pack and carrying case options desired) and a wide range of accessories. The suggested retail price for drill, battery, and charger is \$320. Milwaukee Electric Tool Corporation, 13135 West Lisbon Rd., Dept. OHJ, Brookfield, WI 53005; (414) 783-8311. COMPOUND CUTTING

most powerful on the

market. The Super-

Tough is available in

THE NEW SLANT ON POWer-miter "chop saws" these days is compound cutting, and with good reason. Mouldings and framing lumber are often cut at angles in two planes, especially in the rich carpentry of old houses. Makita's 12" Slide Dual Compound Saw makes the job easier and more accurate with a cutting head that tilts both left and right up to 45 degrees and miter cutting to 60 degrees in ei-

> ther direction, so the mouldings or members don't have to be turned around to change cuts. The LS1211 comes with an electric brake, a 96-tooth carbide

tipped blade, a vertical material vise, and a standard dust bag. Suggested retail price is \$1,620. Makita U.S.A. Inc., 14930 Northam St., Dept. OHJ, La Mirada, CA 90638; (714) 522-8088.



This compact, inexpensive angle grinder is perfect for removing mortar joints.

A NEW GRINDER

FOR LARGE MASONRY REpointing projects, many restorers turn to power tools. DeWalt's new Heavy Duty Angle Grinder is just right for such a job. The model DW400 is smaller and less expensive than most angle grinders, which are built for the rigors of a machine shop. Use a standard masonry blade, or try their diamond-tipped, tuck-pointing blade. It's pricey, but it makes quick work of tough mortar. The suggested retail price for the angle grinder is \$118; for the speciality blade, it's \$195. DeWalt Industrial Tool Company, 626 Hanover Pike,

Makita's new saw offers compound miter cuts with chopand-slide motion.

Dept. OHJ, Hempstead, MD 21074; (800) 433-9258.

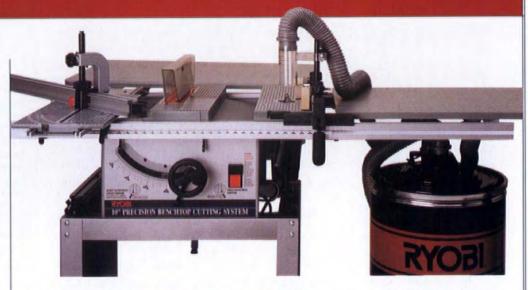
QUIETER CLEANUP

THE WET/DRY VACUUM IS a must for restorers, both professionals and homeowners. Shop-Vac, whose name has become synonymous with the tool, has a new line that significantly reduces the decibel level of the vacuum. They call it Quiet Super Power, or QSP. An air-baffle system and foam insulation reduce the noise from the motors, available from 1.5 to 5 horsepower. The ca-



Shop-Vac's latest line turns down the volume on restoration cleanup.

pacity ranges from 5 gallons to 25 gallons depending on the model. Hose attachments are conveniently stowed on board. The model shown



A high-powered "contractor's" saw with a port for mounting a router or jig saw.

has a 5-horsepower motor and a 16-gallon tank. The suggested retail price is \$191.95. Shop-Vac Corporation, 2323 Reach Rd., Dept. OHJ, Williamsport, PA 17701; (717) 326-0502.

TABLE SAW WITH **ROUTER OR JIG**

THE RYOBI BENCH TOP SAW is practically a portable shop. The 3-horsepower motor and 10" blade will easily cut a 4x4. Plus, the saw's table has a port for a router or jigsaw. An optional attachment kit fastens either one underneath the saw table. Your router becomes a mini shaper and your jigsaw takes on the qualities of a shop tool. With a 36-tooth carbide-tip blade, the saw costs less than \$600; router/jig attachment costs \$85; dust bag is \$30; or vacuum, which doubles as a shop cleanup tool, costs \$130. Ryobi America Corp., 5201 Pearman Dairy Rd., Ste. 1, Dept. OHJ, Anderson, SC 29625; (800) 525-2579.

NO KEYS, PLEASE!

BROKEN BLADES ARE A fact of life with reciprocating saws, especially when there's rough carpentry or demolition underway. Why then should you have to fumble over and over with little wrenches to get cutting again? The folks at Porter-Cable asked the same question, and their answer is a keyless

blade

clamp for their Quick-Change Tiger Saw, the first of its kind. The stainless-steel clamp has two blade positions and is hitched to a muscular 9.6amp motor. The model 9737 Tiger Saw also features orbital action for quicker cutting, and comes complete with a steel carrying case for a suggested price of \$290. Porter-Cable Corporation, 4825 Highway 45 N., P.O. Box 2468, Dept. OHJ, Jackson, TN 38302; (800) 487-8665.

Blades change in four seconds without keys in the unique spring-loaded clamp of Porter-Cable's new Tiger Saw.

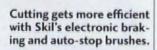


RESTORATION PRODUCTS

BRAKE-SAWING

THE SING OF A SPINNING steel blade may be a romantic part of circular saws, but when work has to wait up to half a minute for that blade to stop, it's just a waste of time. Skil's newest heavyduty circular saw calls a halt to free-wheeling with an electronic brake that engages when you release the trigger, bringing the blade

to rest in



just two seconds. The tool also features brand-new. auto-stop motor brushes that automatically shut

down the saw when the brushes need replacement, preventing motor damage and acting as a "service minder." The saw retails for around \$149. Skil-Bosch, 4300 West Peterson Ave., Dept. OHJ, Chicago, IL 60646; (312) 286-7330.

THE RIGHT ANGLE

THERE ARE OTHER CORDless right-angle drills on the market, but Hitachi's is the most compact, which makes getting into tight spaces -

square to the workpiece. But Panasonic's new Corner Master is offset so the bit is only 5/16" from the edge of the drill. Plus, the mechanism rotates to eight positions, has a 22-stage clutch, 9.6volt battery with 15minute charger, and a quick connect chuck. The drill's suggested retail price is \$369.95. Panasonic Cordless Power Tools, One Panasonic Way, 4A-3, Dept. OHJ, Secaucus, NJ 07094; (201) 392-6655.



say, to run new services in an old stud wall - a lot easier. It's 12" long, 4" wide, and 1 13/6" thick. It's reversible and offers an electric brake as well as a keyless chuck. With a case, charger, and one 9.6-volt battery, the suggested retail price is \$370. Hitachi Power Tools U.S.A. Ltd., 3950 Steve Reynolds Blvd., Dept. OHJ, Norcross, GA 30093; (800) 546-1666.

CORNER MASTER

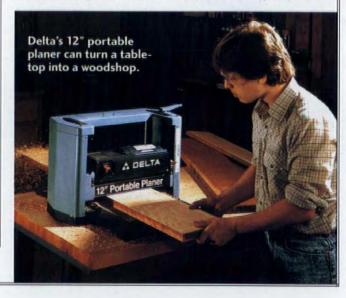
EVER TRY TO DRILL A PIlot or drive a screw in a tight corner? With most drills it simply won't be

PLANE PORTABILITY

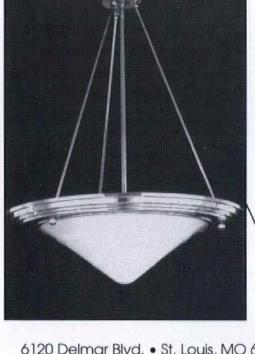
EVERY YEAR, MORE OF what they used to call stationary power tools get redesigned so they can leave the shop or live in



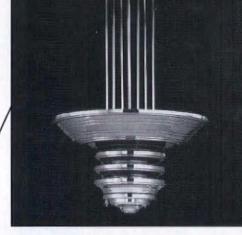
a pickup. Delta's 12" portable planer is a good match for serious oldhouse restorers. With a 12" width and 6" thickness capacity, the planer can handle the needs of most regular cabinetwork, yet it's compact and light enough to be moved using the carrying handles. Power requirements (120-volt, 15 -amp, single-phase motor) are lean too. Retail price for the planer is \$524. Delta International Machinery Corp., 246 Alpha Dr., Dept. OHJ, Pittsburgh, PA 15238; (800) 438-2486.



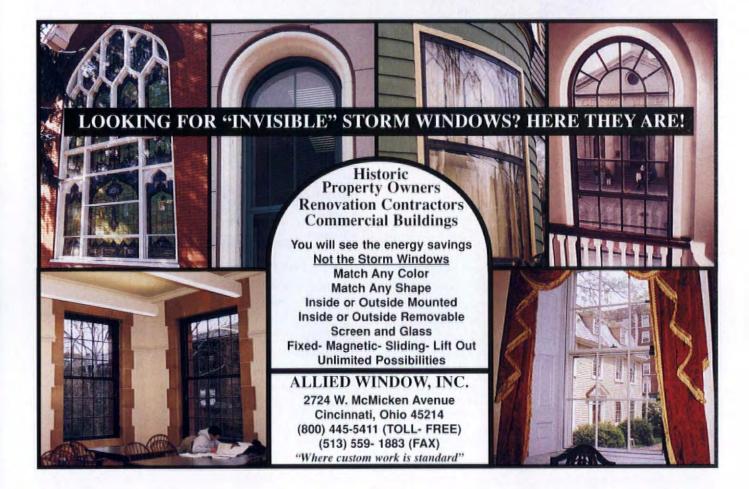
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RESTORATION PRODUCTS

WROUGHT IRONWORK

STEWART IRON WORKS has been manufacturing omamental fences, gates, railings, and interior ironwork since 1886. They're still using solid steel and welded joints. Pick from their catalog of popular styles, or have them design a fence to match a damaged original. A standard iron picket fence with posts costs about \$25 per foot. The Stew-

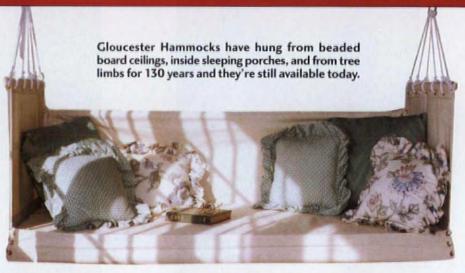


Iron fences and railings made with traditional designs and craftsmanship.

art Iron Works Company, Inc., 20 West 18th St., P.O. Box 2612, Dept. OHJ, Covington, KY 41012; (606) 431-1985.

COLONIAL LANTERNS

PERIOD LIGHTING FIXtures' lanterns are authentic reproductions of 18th- and 19th-century examples at Historic Deerfield, the Massachusetts museum village. Handmade to order, they come with



patina, bright copper, or lamp black finish. They are wired for electric lighting and are U.L. listed. Period Lighting also offers chandeliers, sconces, onion lanterns, student lamps, and indoor lanterns. The example shown costs \$725. Period Lighting Fixtures Inc., River Rd., Dept. OHJ, Clarksburg, MA 01247; (413) 664-7141.

PORCH SWING

D.F. HARRIS HAS BEEN making the Gloucester Hammock, a heavy canvas swing, since 1865. And it hasn't changed much. The wood frame is now a metal spring unit and the horsehair mattress is now 4"-thick foam. But it still hangs from ropes laced through brass grommets

Reproductions of Historic Deerfield lanterns will light up a Colonial or Colonial Revival yard. in the treated cotton duck canvas. It is 6' long, 30" deep, with a 25" high back. The Gloucester Hammock costs \$445. D.F. Harris & Sons, 5 Youngs Rd., Dept. OHJ, Gloucester, MA 01930; (508) 283-2082. curate 18th- and 19thcentury reproductions (color matching is available). And because there are no modern synthetics or flattening agents, the finish texture looks authentic. Traditional painter's sun-



LINSEED OIL PAINTS

why not top off your restoration with a reproduction handmade paint? Like paints made before about 1860, these consist of pure linseed oil, powdered pigment, spirits of turpentine, and natural resin varnishes. The colors, too, are ac-

Linseed oil paints and brushes from Historic Paints.

dries are also available. The high-coverage paints cost \$12.50 per pint and \$21 per quart, with bulk discounts. Historic Paints Limited, Burr Tavern, Route 1, Box 474, Dept. OHJ, East Meredith, NY 13757; (800) 664-6293.



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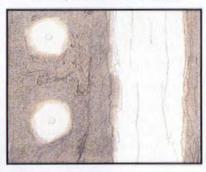
Ordinary paint peels because it won't adhere to chalky surfaces...



...won't stick to tile, glass, metal, formica, or other slick surfaces...



...won't hide graffiti, marker, or other types of stains ...



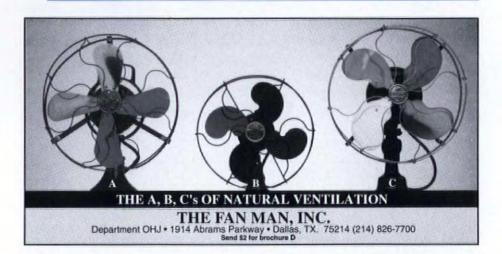
...won't give a uniform look over unsealed porous drywall, masonry, and new wood.



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HOW TO ORDER OUR PLANS

the residential architecture of the country. Of the thousands of house plans available today, few exhibit good design and a grasp of historical proportion and detail. So, in response to requests from OHJ readers, the editors have "done the homework": We've hand-picked plans. In each issue, we offer the most attractive, authentic, and buildable of the historical designs, from all periods of American architectural history. Let us know what plans you're looking for.

You can order actual blueprints for all the houses featured. These plans are designed to conform to national building-code standards. However, the requirements of your site and local building codes mean you'll probably need the assistance of a professional designer (your builder may qualify) or an architect.

For the houses shown in this issue, blueprints include:

- Detailed floor plans showing dimensions for framing. Some may also have detailed layouts and show the location of electrical and plumbing components.
- Interior elevations are included in some plans, showing interior views of kitchen, bath, fireplace, builtins, and cabinet designs.
- Building cross sections: cornice, fireplace, and cabinet sections when needed to help your builder understand major interior details.
- Framing diagrams that

- show layouts of framing pieces and their locations for roof, first, and second floors.
- Energy-saving specs, where noteworthy, are included, such as vapor barriers, insulated sheathing, caulking and foam-sealant areas, batt insulation, and attic exhaust ventilators
- May include foundation plan for basement or crawl space. (Crawl space plans can easily be adapted for full basements by your builder.)

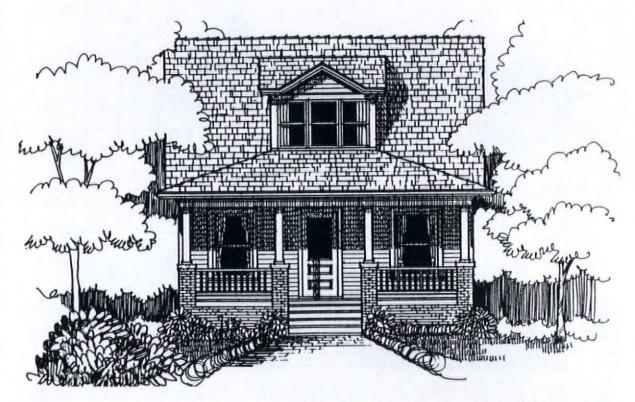
Why order multiple sets? If you're serious about building, you'll need a set each for the general contractor, mortgage lender, electrician, plumber, heating/ventilating contractor, building permit department, other township use or interior designer, and one for yourself. Ordering the 8-set plan saves money and additional shipping charges.

Other notes: (1) Plans are copyrighted, and they are printed for you when you order. Therefore, they are not refundable. If you would like information on ordering more than 8 sets of the same plan, please call our Customer Service Department at (508) 281-8803.

- (2) Mirror-reverse plans are useful when the house would fit the site better "flopped." For this you need one set of mirror-reverse plans for the contractor; but because the reverse plans have backwards lettering and dimensions, all other sets should be ordered right-reading.
- (3) Heating and air-conditioning layouts are not included. You need a local mechanical contractor to size and locate the proper unit for your specific conditions of climate and site.

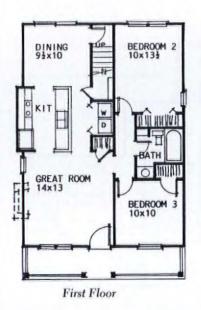
MAIL TO: OHJ House Plan Service, 2 Main Street, Gloucester, MA 01930 Or call (508) 281-8803 to charge your order. Please send the following: PLAN NAME #2 🗖 FIVE-SET PACKAGE......\$______ #3 🗖 EIGHT-SET PACKAGE TOTAL\$ SEND TO _____ ☐ CHECK ENCLOSED CHARGE TO: ☐ VISA ☐ MC STREET CARD #_____ EXP. DATE _____ SIGNATURE OF CARDHOLDER ___ ZIP____ DAYTIME PHONE # Please allow 3 weeks for delivery. PRICES GOOD THROUGH SEPTEMBER 1996 SOQ5

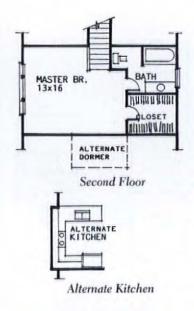
HEARTLAND STARTER HOME



make a great starter home for a couple on a budget. Designed for a small lot, the compact floor plan provides a lot of living space. On the first floor, two bedrooms with roomy closets share a full bath.

The kitchen can be arranged in a U-shaped or galleystyle layout, depending on the homeowner's preference. Upstairs, the attic can be left unfinished or turned into a master suite with a window-seat nook and walkin closet.





Plan RT-06-PV	
Cost	\$170
Set of 5	\$230
Set of 8	\$270
Bedrooms	3
Bathrooms	2
Square Footage	1,161'
First Floor	825'
Second Floor	336'
Ceiling Height	
First Floor	8'1"
Second Floor (to the ridge	e)11'6"
Overall Dimensions	
Width	24'
Depth	

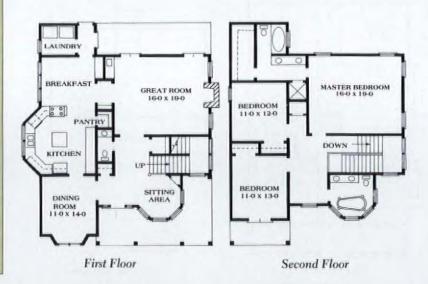
PATTERN BOOK V CTORIAN

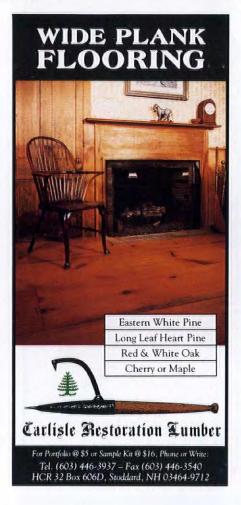


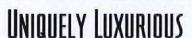
ICKNELL'S VICTORIAN BUILDINGS, PUBLISHED in 1878, inspired the intricate window casings and porch details of this grand Victorian residence. The tower gives instant impact to the gracious foyer; a stained or bevelled glass window on the stair landing will be visible from both floors. The U-

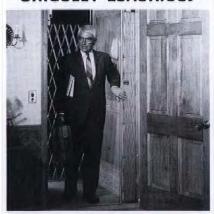
shaped kitchen is adjacent to the dining room and the breakfast room. Note the hutch in the breakfast room with glass doors for cookbooks or ceramics. A cozy, sunfilled sitting area is tucked between the foyer and the staircase. The second floor of the tower is occupied by a charming bath with a claw-footed tub.

Plan HR-51-VI	
Cost	\$230
Set of 5	\$290
Set of 8	\$330
Bedrooms	3
Bathrooms	2 1/2
Square Footage	2,440
First Floor	
Second Floor	1,181
Ceiling Height	
First Floor	10'
Second Floor	9'
Overall Dimensions	
Width	46
Depth	36'









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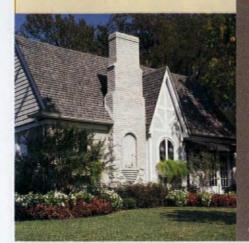
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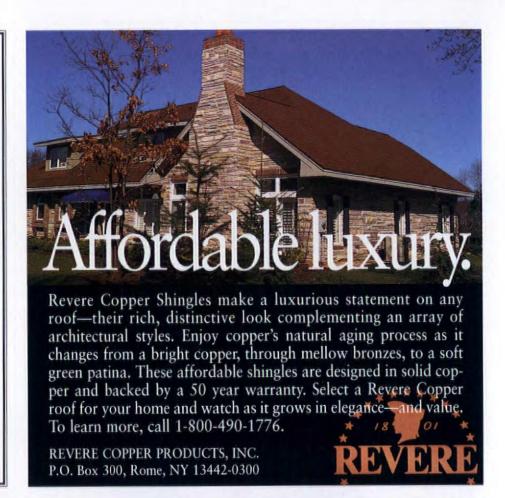
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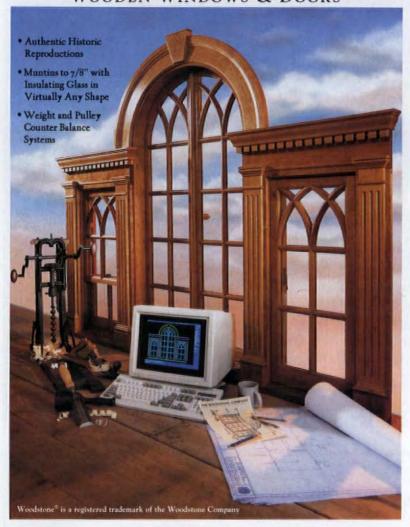
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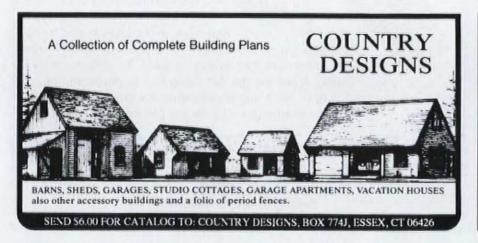


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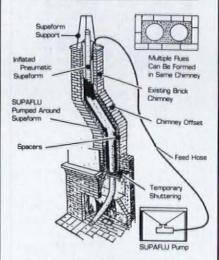


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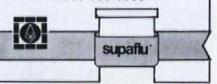


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Real Estate

CHICO, CA-1874 Victorian on small acreage. Large oak/black walnut trees. On National Register. Five bdrms., 4 baths. 4,642 sq. ft. Ready to begin renovation. Pictures/history available. Location, almond orchard area, just outside of small northern California town known for excellent school. \$190,000. Call Bonnie or Carol at Ingram & Shelton Realtors, (916) 891-1531 or (916) 345-4977.

VALLEIO, CA-1025 Craftsman, four bdrms., 1 1/2 baths, approximately 2,000 sq. ft. plus bsmt. Vintage condition, beautiful woodwork and oak floors. Wedgewood stove. Two detached garages, parklike backyard, close to park, playground. \$169,000. Call Jane Lauder, (707) 745-6000.



WOODLAND, CA (above) - Single-storey Italianate Victorian home built in 1882 with separate apartment over detached garage. On Woodland Historic Walking Tour. Main house is 1,200 sq. ft., lot is 1/6 acre. \$155,000. Call (907) 780-5138.

NAUGATUCK, CT - Lovingly restored 1890 Queen Anne. Fourteen rooms, 3 1/2 baths. Lovely lot, natural woodwork, tin ceilings, pocket doors, elegant fireplaces, window seats, fover, 2 staircases, period stove, much more. Zoned for professional office. \$229,000. (203) 723-6609.

BALLGROUND, GA-Stately 1906 2-storey all heart-pine Victorian on 1 acre. Eight fireplaces, 1,500 sq. ft. porch, 2,700 sq. ft. living space, plus 1,000 sq. ft. attic. Eleven rooms. B&B potential for 1996 Olympics. Includes 2 rental houses on adjoining 5+ acres. \$300,000. (404) 578-5877.

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S.E. IA - Elegant stick Victorian at hub of 3 large cities. Has Iowa's oldest B&B license, 6,200+ sq. ft., 8 bdrms., 6 baths, 2 parlors, large kitchens, maids' quarters, frescoes, stained and etched glass. Wraparound porch. National Registry. \$225,000. (818) 368-2837.

PARIS, IL-Elegant brick Queen Anne

situated on 1/2-acre lot. Approximately 5,500 sq. ft. of living space plus full bsmt. and huge attic. Incredible woodwork including curly birch, quartered oak, birdseye maple, and cherry. Grand double staircase, 4 fireplaces with carved mantels, ornately spandreled colonade, original working elevator. Three-car detached garage with 1,500 sq. ft. Three bdrm. guest cottage. \$105,000. (801) 533-0927.

OSWEGO, KS-Three-storey 1904 St. Louis World's Fair House, full bsmt., separate

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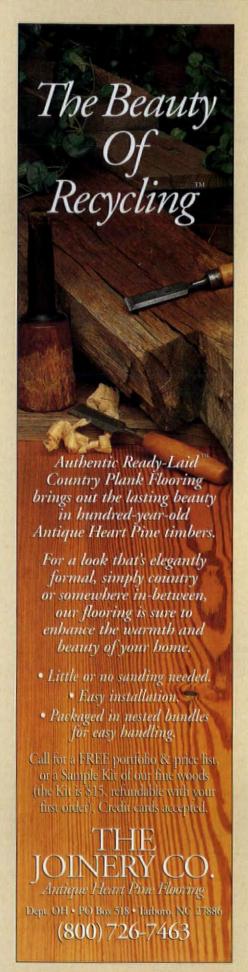
SEARSPORT, ME-ca. 1795 historic Maine coast Cape with attached huge barn. Twelve rooms, 4 1/2 baths, and 59' enclosed porch overlooking Penobscot Bay. The 3-

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In This Section	
Real Estate77	
Destinations82	
For Sale82	
Wanted84	
Events84	
Restoration Services86	
Products Network92	
Advertisers' Index110	



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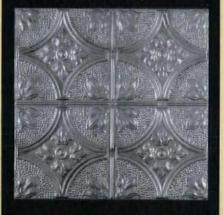
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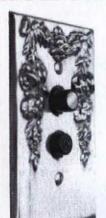
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DENVILLE, NJ-1878 Queen Anne Victorian, fully restored. 30 miles west of NYC. Four bdrms., 2 1/2 baths. Large kitchen with sunroof. Four bay windows, stained glass, pocket doors, pine and maple floors. Ornate exteriors with gingerbread. 1.7 wooded acres. Many lush gardens including herb garden. \$259,000. (201) 586-1617.

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FORT MONTGOMERY, NY-Restored 1790 saltbox Colonial. Dining room with fireplace and wide plank floors; modern kitchen; living room with fireplace; 2 bdrms. (master bdrm. with cathedral ceilings), 1 1/2 baths. Handhewn beams. 45 min. to NYC. On parklike acre with mountain views. \$215,000. Additional acreage available. Call (914) 446-5854.

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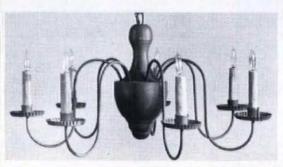


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Events

NE ARTISANS GUILD-Fourth Group Exhibition of the New England Artisans Guild, Arts & Crafts Movement Furnishings and Interior Design, Friday, September 15, 6:30 P.M. and Saturday, September 16, 10:30 A.M.-5:00 P.M. at Parish Hall, First Unitarian Society, 1326 Washington Street (Rt. 16), Newton, MA.

Friday's lecture is on California Bungalows. For information, call John Burrows, (617) 982-1812.

SEMINAR ON CLASSICAL ORNAMENT-Institute for the Study of Classical Architecture 3rd annual seminar and workshop October 14-15 in New York City. Entitled The Ornament of Classical Architecture, the seminar will examine how architects, preservationists, designers, craftspeople, and interested property owners can use decoration in building and design projects today. One-day admission is \$95; 2 days, \$175. Contact the Institute at 111 Franklin Street, New York, NY 10013. (212) 570-7374; fax (212) 627-5740.

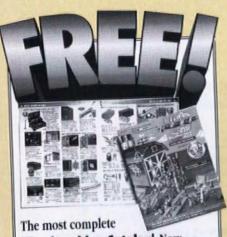
VICTORIAN DECORATIVE ARTS SHOW -Country's premier gathering of finest dealers of authentic Victorian decorative arts and furniture. Metroplitan Art & Antiques, 110 West 19th Street, New York, NY 10011. Gala opening Friday, October 13, 6-9 P.M.; collector's seminars Saturday and Sunday, October 14 & 15, 9-12 noon; show hours Saturday 12-7 P.M., Sunday 12-5 P.M. (212) 473-0200; fax (212) 473-7099.

THEATER TOUR-Preservation Wayne presents Detroit's Historic Theater District Tour, Saturday, October 7. Guided walking tours from State Theater lobby between 10 A.M. and noon. Six movie palaces including nation's largest theater restoration project. (313) 222-0321.

OLD-HOUSE FAIR IN STOCKBRIDGE, MA-The Center for Historic Houses of the National Trust for Historic Preservation and the Massachusetts Historical Commission are sponsoring the second annual Old-House Fair at Chesterwood, summer estate of sculptor Daniel Chester French, September 9-10. Call 413-298-3579 for information on exhibiting or directions.

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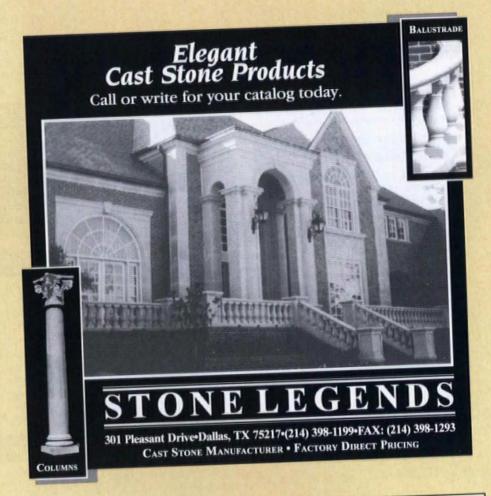


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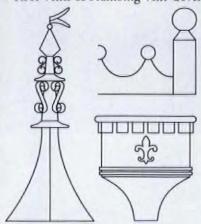
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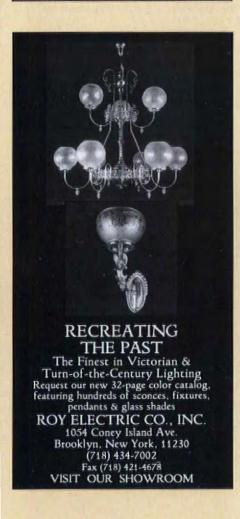


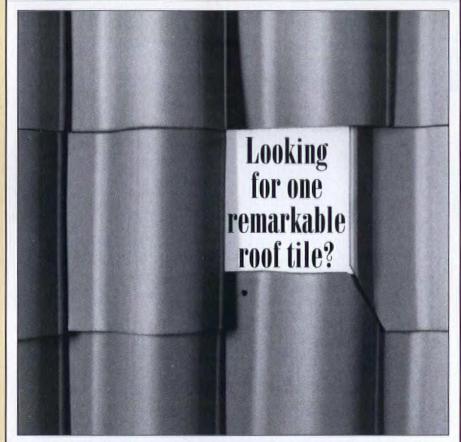
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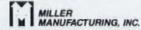
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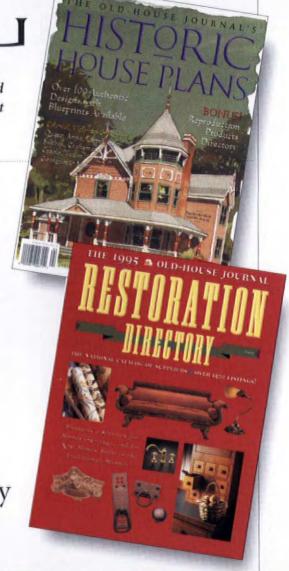
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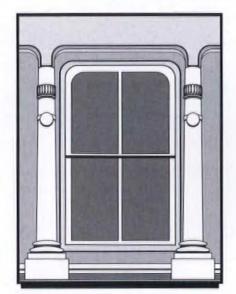
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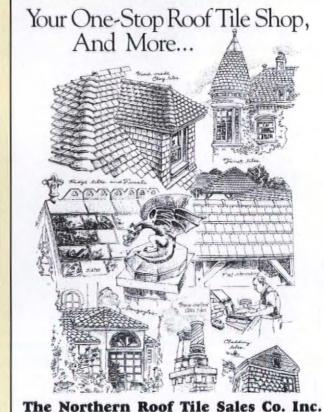
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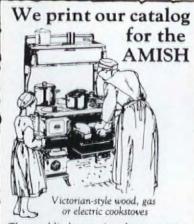


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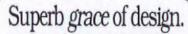
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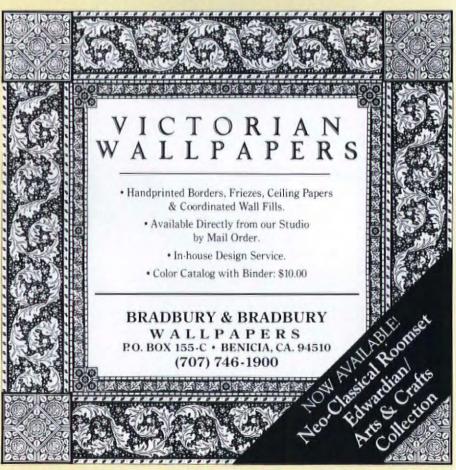
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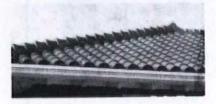
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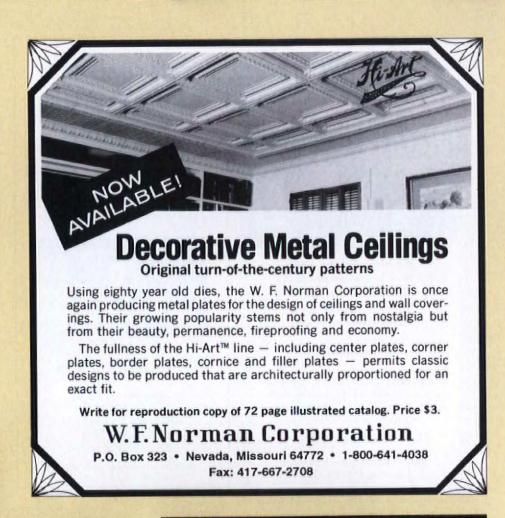
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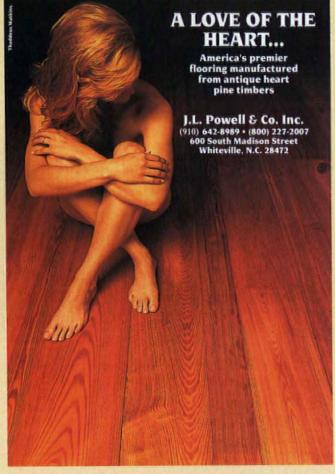
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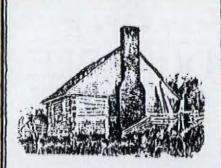
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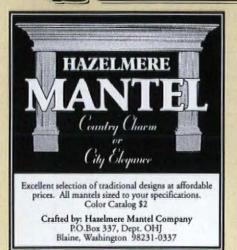
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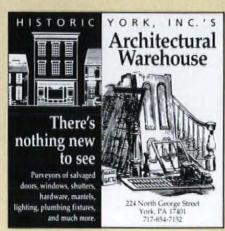
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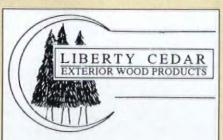
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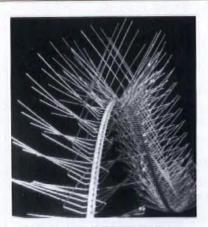


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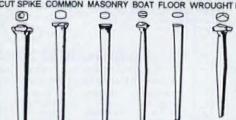
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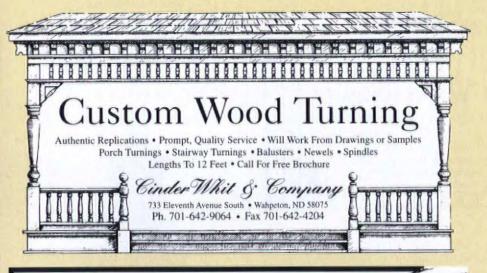
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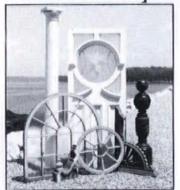
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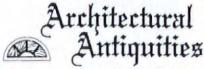
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Advertisers' Index

PRO	ODUCT NETWORK NO. PAGE NO.	PRO	DUCT NETWORK NO. PAGE NO
20	AA Abbingdon Affiliates108	819	Gable & Craft
31	Abatron, Inc. 28 Abatron, Inc. 23,29	560	Gates Moore Lighting
569	Abatron, Inc23,29	792	Golden Flue
598	Acorn Manufacturing Company 69		Good Tme Stove Co10
	Addkison Hardware Co., Inc113	387	Granville Manufacturing9
517	Albany Woodworks		Grate Vents
805	Allied Windows		Griffis Lumber
2.	Alternative Window Company112		Hardware Bath & More
651	American Custom Millwork, Inc.96		Hardware Plus
599	American Home Supply18,82	703	Hartmann-Sanders Column9
611	American International Tool88		Hennessy House 11 Heritage Brass Company 11
	Anthony Wood Products		Hennessy House
49	Antique Hardware Store15		Heritage Brass Company
568	Architectural Antiquities109	580	Historic Floors of Oshkosh
652	Architectural Timber &	735	Historic Paints Ltd. 10
	Millwork		
353 802	Artistic Doors & Windows Inc93	565 801	HomeSaver Chimney Liners10
	Arvid's Historic Woods109		House of Webster9 Hydro-Sil Heat Company8
340	Ashford & Larusson Prod, Inc 90	414	Inclinator Company of America7
	Bendheim Glass	654	
73	Boston Turning Works112	545	Iron Shop, The
-	Bradbury & Bradbury95	22	J.R. Burrows & Company10
27	Brandon Industries95		Jack Wallis Stain Glass
21	Brass Light Gallery	74	
41	Braseworks Lighting	741	& Doors
	Brassworks Lighting 112 Brickyard, The 113	2	John Stortz & Son
gı	Carlisle Restoration Lumber73	492	Kennebec Company, The
312	Certified Chimney Contractors96	334	King's Chandelier Company7
684	Chadsworth Inc 60	534	Lampshades of Antique
242	Chadsworth Inc 60	672	Lampshades of Antique 11 Lehman Hardware 9
35	Chadsworth, Inc	493	Liberty Cedar 10
47	Chelsea Decorative Metal78	433	Lighting by Hammerworks
4/	Chestnut Specialists	822	Ludowici Roof Tile, Inc8
	Chubb Group of Insurance Co15	110	Mac The Antique Plumber8
694	CinderWhit & Company107		Maple Grove Restorations
26	Classic Accents79	359	Marshalltown Trowel Co
733	Commercial Gutter Systems105	9	Marvin Windows
42	Country Curtains 107	410	Maurer & Shepherd Joyners10
603	Country Designs76		McFeely's
212	Craftsman Lumber81	215	Midget Louver Company10
	Crawford's Old House Store111	16	Midwart Architectural
397	Crown City Hardware6, 74, 75		Wood Products -
679	Crown Point Cabinetry78,79,81	541	Miller Manufacturing
44	Cumberland Wooderaft97		Monarch Radiators10
	Custom Decorative Molding112	813	Mullane Company8
518	Custom Wood Turnings108	113	National Supaflu Products
	Dan Holohan75		Newbridge Communications
245	Dan Holohan	818	Newport Fasteners Company
740	Design Toscano94		Nixalite of America10
101	Devenco Louver Products105	527	North Fields Restoration2
595	Donald Durham Company74	732	Northern Roof Tile
	du Bussion Brass110	69	Old Carolina Brick
653	Durable Slate Company101		Old Fashioned Milk Paint Co11
	Ed Donaldson111 Edward Hamilton104	32	Old Wagon Factory8
		53	Oregon Wooden Screen Door10
746	Elk Corporation74	219	Original Cast Lighting6
55	Erie Landmark 81	702	
	Eugenia's Place113		Paul Collins
821	Evergreen Slate Co., Inc97		Pennsylvania Plinth Company11
221	Fan Man, The69		Period Lighting Fixtures11
615	Fein Power Tools, Inc9		Pioneer Millworks11
554	Felber Ornamental Plastering93	726	Preservation Products
	Fischer Artworks	728	Primrose Distributing10
294	Fischer & Jirouch87	758	Princeton Plans Press
488	Follansbee Steel22	38	ProTech Systems, Incgo

3	622	Pullman Manufacturing Corp89
3	659	Reggio Register Company73
,	10	Rejuvenation Lamp & Fixture2
3	538	Renovator's Supply7
5		Restoration 95'
3		Restoration 95'
1	808	Revere Copper Products, Inc75
	752	Rinnai America Corporation109
	11	Roy Electric Company89
5	365	Rutland Products96
	1	Schwerd Manufacturing11
1		Shutter Depot111
3		Shuttercraft108
	817	Slate International, Inc
	30	Smith-Cornell
	788	Snelling's Thermo-Vac106
	745	South Side Roofing17
,	675	Specification Chemicals
		Steptoe & Wife112
	539	Sterling-Clark-LurtonCorp100
	122	Stewart Iron Works Co108
	815	Stone Ledges85
3	748	Street Level Supply106
	820	Sur-Fin Chemical75
		Sylvan Brandt
	809	TLC Products100
		Touchstone Woodworks113
	551	Tremont Nail Company106
		Uncle John's
		Gingerbread House112
		Van Dyke'stii
	776	Vermont Soapstone102
	816	Vermont Structural Slate Co102
	4	Victorian Lighting Works95
	13	Vintage Wood Works83, 111
	401	Vixen Hill90
	730	Vulcan Supply Corp
	128	W.F. Norman Corp99,101, 105
	810	Wagner Spray Tech Corp3
	438	Ward Clapboard Mill99
		William J. Rigby Co
	589	William Zinsser & Co69
	439	Williams & Hussey102
	582	Window Quilt79
		Wood Factory, The
		Woodhouse111
	409	Woodstock Soapstone Co85
	194	Woodstone Company76
-	643	Woodworker's Store, The85
		Wurster's Traditional Timber112
	722	Yield House84

PRODUCT NETWORK NO. PAGE NO.

Advertising Sales Offices MAIN OFFICE

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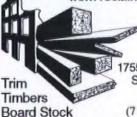
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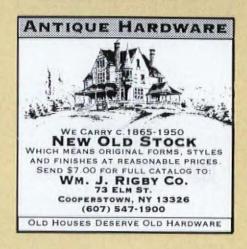


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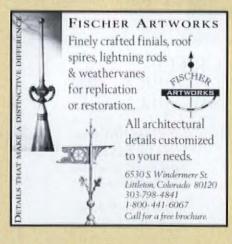
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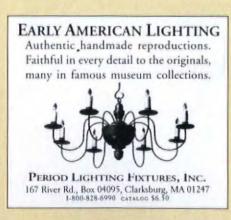
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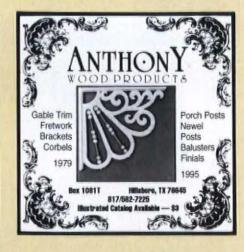
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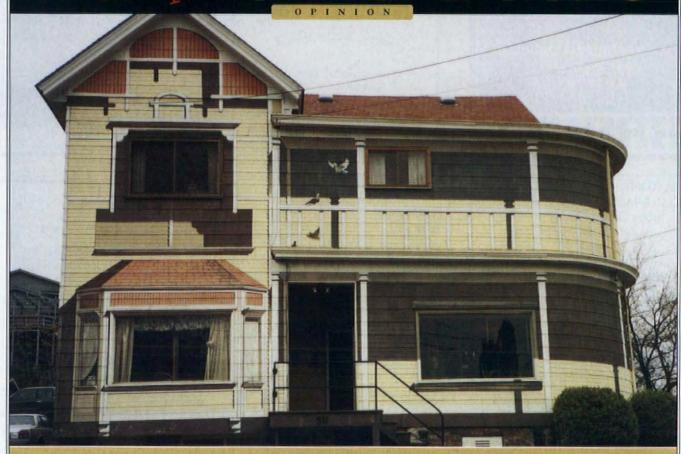


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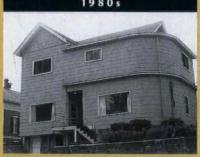
Virtual Unmuddling

IKE IT OR NOT, THE 1990S HAVE GIVEN US FURTHER LICENSE TO play with reality. Thanks to computer trickery, we can fool the senses into seeing dinosaurs roaming a Caribbean theme park or universes within a virtual reality network.

Special effects of an older kind — specifically, *trompe l'oeil* painting — are at work in The Dalles, Oregon. Look closely at the photo above and you'll see what we mean. Are those shingles over the first-storey bay window, or maybe the bay's over the shingles? Is there really a bird on the porch railing? For that matter, is there really a porch?

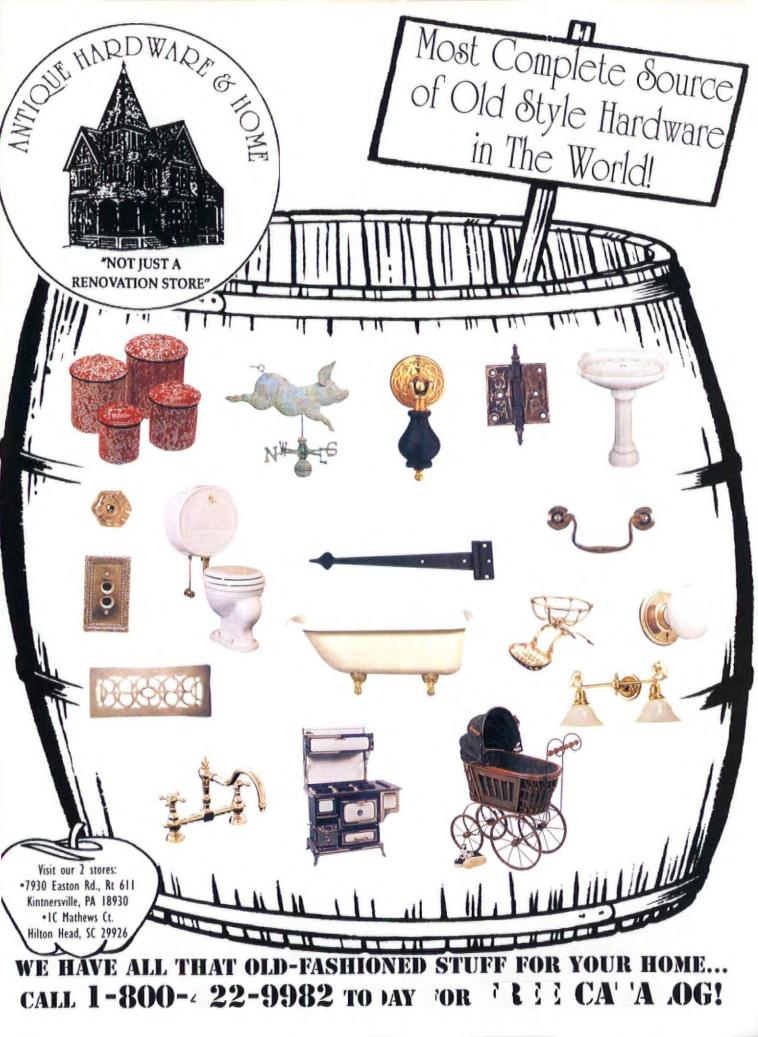
If you think you're seeing double, in a way you're right. Back in June, 1984, this two-family Victorian house made the Remuddling page when we noted that the original twin porches (at right) had been walled and windowed out of sight (at right, above). Now the porches and ornaments are back — sort of. This two-dimensional "restoration" may be an honest, but deluded, attempt to rematerialize the earlier features. In the real world, though, even the shadows are only as deep as a layer of paint,

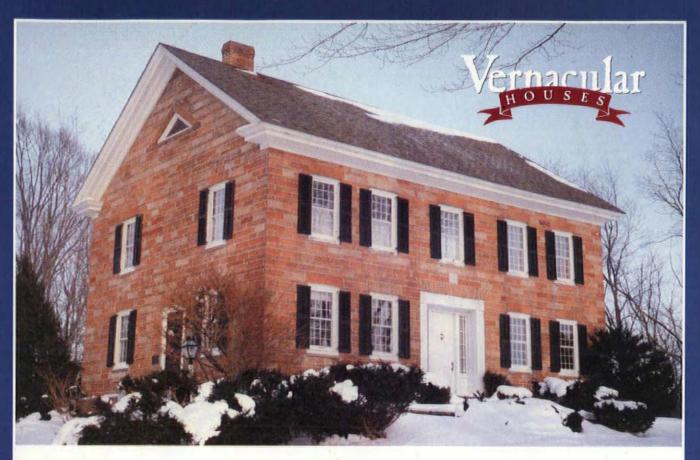
Thanks to Jacqueline Cheung for capturing the latest incarnation in color.





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SANDSTONE HOUSES OF POTSDAM, NEW YORK

ORTHERN NEW YORK STATE IS rich in sandstone, especially near the village of Potsdam along the Racquette River. Potsdam sandstone, unlike most sandstone, is extremely durable and has a distinctive pink color. Early-10th-century settlers recognized its value as building material and, between 1820 and 1845, constructed many 1 ½-storey, Federal-style cottages and public buildings.

In the earliest houses, the stone is laid in random rubble walls or narrow courses. By the late 1820s, the slab-and-binder technique appeared — a masonry style that is probably unique to the Potsdam area. The stone is laid so the grain direction alternates with each course. The slabs are long facepieces with the grain running



TOP: Although less commonly built, some sandstone houses, such as this 19th-century example, were two storeys high with Greek Revival embellishments. ABOVE: Slab-and-binder masonry alternated face-cut and bed-cut sandstone.

vertically. The binders are narrow horizontal pieces that tie the 2' thick walls together.

In the 1870s and 1880s, Potsdam sandstone acquired a wide commercial reputation. Railroads carried it as far as Ottawa and New York City. Later structures, mostly public buildings, were constructed with the rough-surfaced, random blocks of the ashlar style. (Only two Potsdam residences date from this era.) The heyday was short lived, however. In the early 20th century, the industry collapsed because, compared to other materials, sandstone was too expensive to prepare. Also, during World War I, there were restrictions on transporting commodities not essential to the war effort. Today, only 25 sandstone houses remain in Potsdam and outlying hamlets.

> — Susan Omohundro Hannawa Falls, New York

OLD-HOUSE JOURNAL