

# Where There's Smoke, There Can Be Trouble

*Solutions to Fireplace Problems Are as Varied as the Causes*

By Jeffrey Seisler

**T**his winter has been filled with fireplace-perfect days, days when the swirling snow and icy rain have made staying indoors in front of the fireplace uncommonly pleasurable. But for some, the joy has been diminished by smoke belching out from the fireplace for no apparent reason, or by smoke seeping through cracks in the exterior brickwork of the chimney.

Fireplaces are popular throwbacks to a time when they were the home's primary heating source. But when they function poorly, they can be the source of considerable aggravation, expense and potential danger. Some problems, such as back-smoking, can plague any fireplace old or new. Others, such as mortar and brick deterioration, are characteristic of older homes—especially those built prior to World II when many chimneys had no linings.

Solutions to fireplace problems are as varied as the causes, and it is important to understand their nature and the options at your disposal before acting to ensure that your fireplace works safely and effectively.

## SMOKING PROBLEMS

There are many reasons fireplaces back-smoke into living areas, from an obstruction in the flue to poor chimney construction to crumbling materials. Intermittent puffing suggests the problem is wind-related, while steady smoking means the problem likely is inside the house. Some of the solutions to a smoky fireplace can be achieved easily for little or no investment; those involving structural repairs are more costly.

One of the simplest problems to deal with is the "windy day smoker." This is a chimney into which air drafts are forced on blustery days—down the flue, into the firebox and out into the room. The situation most frequently occurs with traditional masonry chimneys and usually can be solved by installing a chimney cap (metal,

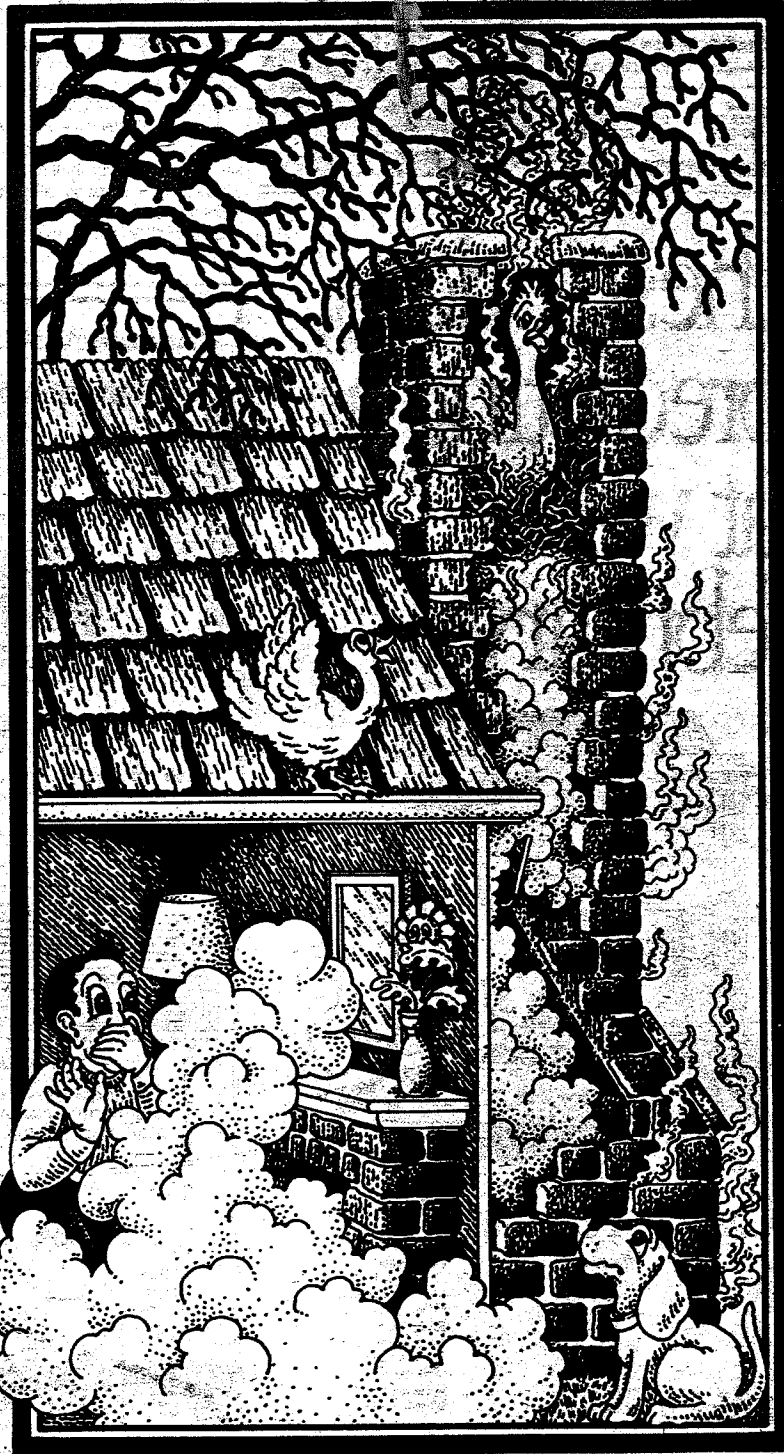


ILLUSTRATION BY CAROL SCHWARTZ

factory-built chimneys typically come with chimney caps). A chimney cap will also keep out such vagabonds as birds, raccoons and squirrels, whose nests can be another source of back-smoking.

There are a variety of caps for masonry chimneys: a dome-shaped steel cap; a flat plate of stone, steel or concrete; or one of many decorative ceramic types common in Europe. Sometimes a wire mesh or "spark arrester" is used as part of, or in addition to, the cap to prevent flammable particles from escaping and landing on the roof or in the yard, creating the possibility of fire. Because wire meshes can become clogged over time, a periodic visual inspection should be done. (If you cannot get onto the roof for a close look—for this or other chimney problems—use binoculars or a camera with a telephoto lens.)

Trees overhanging the chimney sometimes create a canopy effect, which can result in intermittent fireplace smoking. Clip tree branches a least 10 feet from the chimney opening to solve the problem and to help prevent the tree from catching fire.

Finally, air leaks in a home can cause changes to internal air pressure and general draftiness within the house, all of which can contribute to a smoky fireplace. On windy days in particular, heated air flowing out of loose-fitting windows and doors can suck air from other parts of the house, including the chimney, preventing the fireplace from doing its job.

Caulking and weatherstripping installed around doors and windows will help eliminate the sources of intermittent excess air flow (not to mention heat loss) within a home. In houses with more than one story, a temporary fix would be to close windows and doors on the upper floor or floors to reduce the exhaust effect that drags smoke from the fireplace.

A "steady-smoker" poses more of a problem than an occasional smoker. To determine the severity of the problem, first use a draft test to determine how well the

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are blocked and the return air—and smoke from the fireplace—is drawn back toward the furnace. An improperly designed forced-air system with too much return air through oversized return-air registers also can have a similar effect. In either case, the fireplace will smoke steadily when the heating system is on. A professional heating specialist may be required to resize the return air ducts.

If none of these techniques stops the back-smoking, more complicated steps may be required that involve repairs or reconstruction. Here are further considerations:

■ **Chimney height.** Apart from acting as a means for smoke to escape a fireplace, chimneys are designed to draw a draft up into the fireplace to keep the fire burning properly. Chimney height, and its clearance from other parts of the roof, becomes an important factor in producing

an adequate draft and ensuring that sparks flying from the chimney have time to cool.

Most local building codes abide by (at a minimum) the "3-foot, 2-foot, 10-foot rule" to determine the adequate height of a masonry or factory-built metal chimney.

According to the rule, the chimney must be at least 3 feet higher than the highest part of the roof opening through which the chimney passes, and at least 2 feet higher than any part of the roof within 10 feet (measured horizontally) from the point where the chimney exits the roof. Chimneys built in accordance with these requirements will improve drafts and reduce back-smoking into the house.

■ **Leaky cleanout trap door.** Many fireplaces have an ash trap, an opening in the floor of the fireplace into an open shaft within the basement wall where ashes fall for easy removal. The cast-iron (or other metal) covers leading into the ash trap are designed to be air tight. If they are not, up-drafts will be created and force smoke into the living space.

■ **Multiple fireplaces.** Homes with more than one fireplace sometimes have internal house drafts that suck smoke from one fireplace to another, particularly from lower levels in a multistory home to upper levels. As with a home that is poorly caulked and weatherstripped, it is common for a basement fireplace to smoke continually due to negative pressure—or a stack effect—created by air drawn through a fireplace in an upper

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level of the house. If upper-story fireplaces are unused it may be wise to seal them closed to avoid smoking fireplaces downstairs.

Glass doors with a tight seal around the fireplace upstairs also may help reduce the stack effect. Providing a source of outside air for the lower-level fireplace, either through an open window or by installing narrow air-intake pipes into the firebox, could help alleviate the problem. Air-intake kits can be purchased, or the work can be done by a fireplace specialist.

On the exterior of homes with multiple fireplaces, constant smoking can be caused by the close proximity of chimneys leading to different fireplaces. Smoke from one chimney can be drawn down another chimney (when one is operating and the other is not), particularly if the flue damper on the unused fireplace remains open. If the problem is chronic, you will have to plug the top of one flue and/or the fireplace to avoid continual smoking.

### OLD HOUSE CHIMNEYS

Masonry chimneys, like other parts of the house, settle and crack over time. Older homes may have additional, more serious chimney problems due to the fact that one fireplace may share a common flue with another in the house or, in the case of a town house, with a fireplace belonging to a next door neighbor.

Air leaks can emanate from any number of places within the flue path that may not be readily apparent to the homeowner. Over time, parts of the flue paths may deteriorate from age or as the result of another old-house problem: water seepage through cracks and holes in upper areas of the chimney or roof.

Some minor repairs to the fireplace or even the chimney can be done by a handy do-it-yourselfer. Remember, however, that common mortar won't stand up to high heat conditions. Cracks and gaps should be repaired using reinforced portland concrete, reinforced refractory cement or any of a variety of fireplace repair products specially designed for high temperature masonry applications.

Some older homes originally had more than one solid-fuel heating appliance hooked into the same chimney. The openings—a through-the-wall hole from an old wood-burning stove, for example—should be closed permanently to avoid smoke leaking into the room and to prevent fires caused by errant particles. Sometimes these holes are covered with a flat sheet-metal plate and are hidden behind old wallpaper, as the entry ports (also called

breachings) are not readily visible.

If you encounter smoke leaking from an area other than the fireplace opening, don't put off the chore of locating an open or leaky breach and sealing it with at least a four-inch thickness of masonry plugging (bricks and mortar).

Mortar typically lasts about 60 years before it needs to be replaced. Terra-cotta linings crack and crumble over time, so if you have problems with mortar or brick dust falling into the fireplace when you open the flue damper, it's probably time to relined the chimney. Chimneys designed originally for gas fires—from about 1880 to 1940—may not even have a chimney liner.

If you find that your chimney needs to be lined or relined, you have two options: poured concrete or metal. Each type offers two commonly used techniques.

## Trees overhanging the chimney can create a canopy effect, which can cause smoking. Clip branches 10 feet from the chimney opening to solve the problem.

■ **Poured concrete liners.** Poured concrete liners strengthen existing chimney masonry. One technique uses a long bladder or balloon that is inserted into the chimney and filled with air. The concrete is poured around the balloon to create the liner. When dry, the balloon is deflated and removed, forming a smooth, long-lasting flue liner.

The other technique uses a vibrating bell or buoy that is inserted into the chimney. Small amounts of concrete are poured down the chimney as the electrically vibrated bell is raised slowly, causing the concrete mixture to line the chimney wall. This technique is used when the chimney opening is relatively large, as with older, unlined chimneys.

In either case, make sure the contractor checks the chimney carefully and repairs any cracks. Pressure from the concrete mixture can bulge or burst deteriorated chimneys if they are not repaired prior to relining.

■ **Rigid steel liners.** In chimneys that are straight, without twists and turns, a rigid stainless steel liner surrounded by a blanket of insulating

material can be inserted into the chimney. If the chimney has bends, a flexible, corrugated stainless chimney insert can be used, and a mixture of cement and insulating Perlite wet down and poured around the steel liner, insulating the chimney from excessive heat.

Investigation by a chimney sweep may help identify more serious problems, but a mason specializing in chimney repairs may have to be called to repair the damage. Don't be surprised if estimates for repairs to the innards of a chimney's masonry or relining are in the \$1,000 to \$2,500 range—depending upon the condition of the chimney, its height and the way the flue branches off to different fireplaces within the house. A chimney reconstruction could cost as much as \$5,000.

### FIREPLACE SAFETY

No matter how structurally sound, a fireplace can be dangerous if not used properly.

According to the National Fire Protection Association, a majority of total residential fires strike between 9 p.m. and 6 a.m. while everyone is asleep. Smoke detectors will help prevent fatalities. Additionally, an approved fire extinguisher should be kept on hand and within easy reach of the fireplace. In case of dangerous mishaps, avoid using water to douse an uncontrolled fire (sand is better), since hot ash and steam tend to scatter hot particles over a wider area. Additionally, the cold-water douse can crack metal parts of the fireplace or floor.

If a fire inside the chimney does occur—you may hear a loud roar in the chimney—call the fire department immediately. If possible, close the damper (your fireplace might have an exterior handle, or you might be able to hit the handle with a fire poker). This will reduce the upward air draft into the chimney and the intensity of the fire.

After the fire is out, have the chimney and fireplace inspected by a professional to determine what, if any, damage needs to be repaired before using the fireplace again.

For more information about chimney maintenance and repairs, contact the National Chimney Sweep Guild, P.O. Box 563, Olney, Md. 20832 (1-301-774-5600). For additional information about woodstoves, fireplace inserts and other wood-burning equipment, contact the Wood Heating Alliance, 1101 Connecticut Ave. NW, Suite 700, Washington, D.C. 20036 (1-202-857-1181).

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