



IMPROVING FIREPLACE EFFICIENCY

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A fireplace is one of the most wanted features in a new home according to a recent National Association of Home Builders survey. Many homeowners now consider installing a fireplace as a supplementary heat source to lower utility bills. Although much of the fire's heat goes directly out the chimney, certain features make the fireplace more efficient.

Air Source and Control

First, provide an air source for draft and combustion which will not draw warm air out of the house since this lost air is very costly when the home is heated by natural gas or electricity. An underfloor air inlet with grill and damper control on the hearth draws air from outside the house rather than through the room. Air also can be

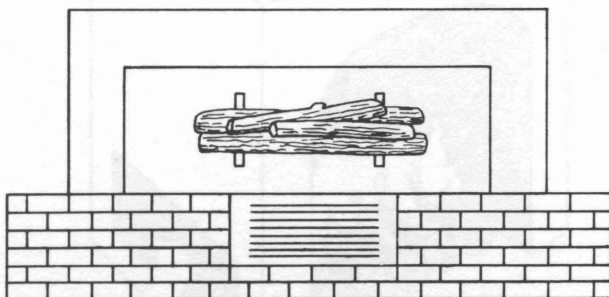


Figure 1. Fireplace with an underfloor air inlet.

provided by slightly opening a window by the fireplace. In masonry fireplaces located on outside walls, a special ventilating brick between the outside and the ashpit provides an air source.

While air for draft is needed, a damper to regulate the draft is equally important. Close the damper when a fire is not burning to prevent heated air loss. Use the damper to adjust the throat opening according to the type of fire. For example, a roaring pine fire requires a full throat opening, but a slow burning hardwood log fire requires only 1- or 2-inch openings. Set the damper so that no smoke enters the room.

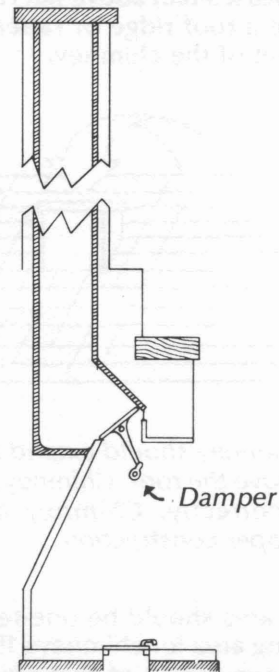


Figure 2. A damper regulates air for draft.

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A glass enclosure with an adjustable damper adds to the efficiency of the fireplace because heat radiates through the glass into the room; the damper is left open to provide air for draft and combustion. The glass enclosure prevents a down draft when kitchen or bath ventilating fans are on. At night, the damper can be closed before the fire dies down (the fireplace damper cannot be closed).

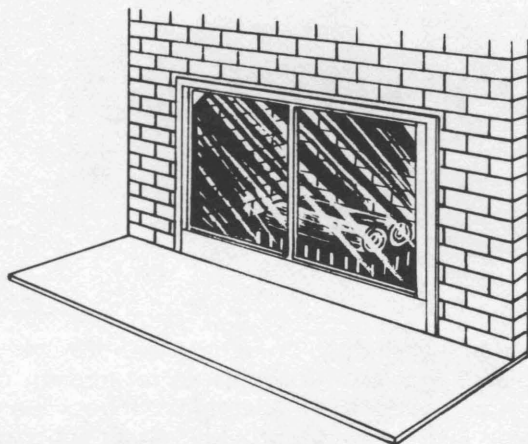


Figure 3. Fireplace with a glass enclosure.

Flue Design

A well-designed chimney and flue are necessary for an efficient draft to supply air to the fire and to expel gases the fire emits. Extend the chimney at least 3 feet above flat roofs and at least 2 feet above a roof ridge or raised part of a roof within 10 feet of the chimney.

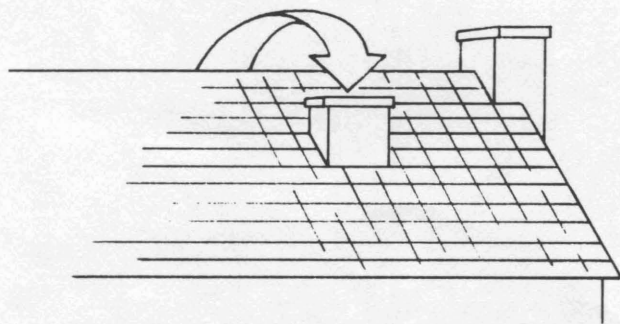


Figure 4. Chimney should extend at least 2-3 feet above the roof. Chimney at left is placed incorrectly. Chimney at right shows proper construction.

The flue area should be one-tenth of the fireplace opening area for chimneys 15 feet or over in height and one-eighth of that area for chimneys under 15 feet in height.

Size

The size of the fireplace, determined by the room size, also affects efficiency. A large fireplace provides more heat than is needed and visually overpowers a small room. A small fireplace, on the other hand, would not provide adequate heating in a large room and would look out of scale. For efficiency, the fire size should fit the size of the firebox. There is much greater heating efficiency in a firebox 36 inches wide, well filled with flame, than there is if the same fire is built in a 48-inch firebox. A shallow opening radiates relatively more heat than does a deeper one.

The dimensions for a well-designed fireplace area are:

- width — 24 to 84 inches for the opening
- height — $\frac{2}{3}$ to $\frac{3}{4}$ of the width
- depth — $\frac{1}{2}$ to $\frac{2}{3}$ of the height

Type of Fireplace

Both masonry and prebuilt fireplaces have advantages. A masonry fireplace radiates heat for hours after the fire has gone out. When located on inside walls, this heat can be more fully utilized.

The free-standing, prebuilt fireplaces are the most versatile and can be installed by the do-it-yourselfer. The firebox is continually cooled by circulating air. Heat circulating fireplaces, like other prebuilt fireplaces, take the guesswork out

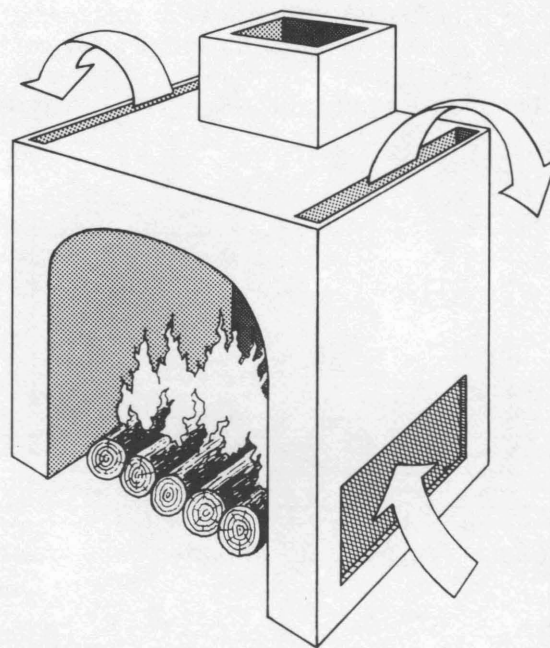


Figure 5. Heat circulating fireplace.

of fireplace building and insure proper damper size and location. Heat circulating fireplaces provide radiated heat in addition to circulated, convected heat. Heated air is circulated into the room by vents above or beside the firebox. Air comes into this vent chamber created by the double wall construction through grills at the lower level. The air is heated by contact with the fireplace walls and discharged through registers near the chamber top. An air circulating fan provides additional efficiency.

Grates

A fireplace grate has both advantages and disadvantages. A fireplace grate holds logs together but fires built on the firebox floor provide more intense radiation. The new C-shaped grate draws cold air into the opening at the bottom, heats it as it passes through the tubes and discharges the hot air from the top of the tube opening into the room. However, the tube grate cools combustion because it circulates cold air through the firebed.

Type of Fuel

The type of wood also affects energy effi-

ciency. Drywood gives maximum heating energy. It has a heat content of about 7500 BTUs per pound, regardless of species, but the energy per cord depends on species. A cord of hardwood has more pounds than a cord of softwood.

When a fireplace is efficient, homeowners enjoy the coziness and warmth as well as the fuel dollar savings.

References

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