deterioration; excellent in draping qualities; and resistant to flexing—that is, the fibers will not break easily when bent as they are in the folds of curtains. (Martha L. Hensley)

**Fireplaces**

If you want a fireplace in your new home, if you want to “sit by the fire and take hold of the ends of the earth” (as Ralph Waldo Emerson wrote), my first advice is that you plan its place, design, and size as you begin to plan the house itself.

Your architect, if you have one, will offer his experience and skill as to proportion, size, location, and design of the fireplace so that it is in harmony with the rest of the room and fulfills the functional requirements.

You will, of course, have many ideas from reading articles in magazines and other publications about styles and designs, but in selecting the most suitable type and design you are on surest ground if you choose a simple fireplace, use locally available materials, and install it according to tested principles.

You need not make it too fancy. The small house may have a fireplace, in keeping with its scale, that is as charming and comfortable as the pretentious rambler, which has a contemporary fireplace so built that the fire in it can be seen from two or three sides.

A fireplace should harmonize in detail and proportion with the room in which it is, but safety and utility should not be sacrificed for appearance.

Its position in the room should be coordinated with the location of the chimney, of course, so as not to spoil the exterior appearance of the house.

Also, there should be an area of comfort that is not affected by the toing-and-froing of other persons in the room.

Consider well the size of the opening, as heat radiated from a fireplace comes mostly from the heated brickwork that surrounds the fire.

For example, a fireplace 30 inches wide, well filled with fire, has greater heating efficiency than a 48-inch fireplace with the same fire. Openings usually are 2 to 6 feet wide.

The kind of fuel to be burned may suggest a practical width. For example, for cordwood (4 feet long) that is cut in half, an opening 30 inches wide is desirable. A narrower opening can be used for coal.

The height of the opening can range from 18 inches for an opening 2 feet wide to 40 inches for one that is 6 feet wide. The higher the opening, the more chance there is of a smoky fireplace.

In general, the wider the opening, the greater the depth. A shallow opening throws out relatively more heat than a deep one, but holds smaller pieces of wood.

In small fireplaces, a depth of 12 inches may permit good draft, but a minimum depth of 16 inches is recommended to lessen the danger that brands fall out on the floor.

Suitable screens in front of fireplaces minimize the danger of brands and sparks.

The chimney also must be soundly engineered. It should be designed and built so that it produces sufficient draft to supply enough fresh air to the fire and to expel smoke and gases of the fire.

All fireplaces are constructed in much the same way, regardless of design.

The construction of the foundation footing for chimneys with fireplaces is like that for chimneys without fireplaces. The footings must rest on firm soil below the frostline.
The fireplace hearth should be of brick, stone, terra cotta, or reinforced concrete at least 4 inches thick. It should project at least 20 inches from the chimney breast and should be 24 inches wider than the fireplace opening (12 inches on each side).

The hearth can be flush with the floor, so that sweepings can be brushed into the fireplace, or it can be raised. A common practice, especially in contemporary design, is to raise the hearth to various levels and extend its length as desired.

If there is a basement, a convenient ash dump can be built under the back of the hearth.

In buildings with wooden floors, the hearth in front of the fireplace should be supported by masonry trimmer arches or other fire-resistant construction. Wood centering under the arches used during construction of the hearth and hearth extension should be removed when construction is completed.

Building codes generally require that the back and sides of fireplaces be constructed of solid masonry or reinforced concrete at least 8 inches thick and be lined with firebrick or other approved noncombustible material.

The jambs should be wide enough to provide stability and be pleasing.

For a fireplace opening 3 feet wide or less, the jambs can be 12 inches wide, if a wood mantel will be used, or 16 inches wide, if they will be of exposed masonry. For wider fireplace openings, or if the fireplace is in a large room, the jambs should be proportionately wider.

Fireplace jambs often are faced with ornamental brick or tile.

No woodwork should be placed within 6 inches of the fireplace opening. Woodwork above and projecting more than 1½ inches from the fireplace opening should be placed not less than 12 inches from the top of the fireplace opening.

A lintel must be installed across the top of the fireplace opening to support the masonry. For fireplace openings 4 feet wide or less, one-half by 3-inch flat steel bars, angle irons 3½ by 3½ by ½ inch (or specially designed damper frames) may be used. Wider openings require heavier lintels.

If a masonry arch is used over the opening, the jambs must be heavy enough to resist the thrust of the arch.

The drawing shows the construction of a typical fireplace, and the table gives recommended dimensions for essential parts of fireplaces.

Proper construction of the throat area (ff, in the drawing) is essential.

The sides of the fireplace must be vertical up to the throat, which should be 6 to 8 inches or more above the bottom of the lintel.

The area of the throat must be not less than that of the flue. The length must be equal to the width of the fireplace opening and width will depend on the width of the damper frame (if a damper is installed).

Five inches above the throat (at ee, in the drawing), the sidewalls should start sloping inward to the flue (tt).

A damper consists of a cast-iron frame with a hinged lid that opens or closes to vary the throat opening.

Dampers are not always installed, but they are recommended, especially in cold climates.

With a well-designed, properly installed damper, you can regulate the draft; close the flue to prevent loss of heat from the room when there is no fire in the fireplace; and adjust the throat opening according to the type of fire to reduce loss of heat.

For example, a roaring pine fire may require a full throat opening, but a slow-burning hardwood log fire may require an opening of only 1 or 2 inches. Closing the damper to that opening will reduce loss of heat up the chimney.

A damper also permits you to close or partly close the flue to prevent loss of heat from the main heating system. When air heated by a furnace goes up a chimney, an excessive amount of fuel may be wasted.

Dampers of various types are on the
Construction details of a typical fireplace. (The letters indicate specific features discussed in the text.) The lower right-hand drawing shows an alternate method of supporting the hearth.

market. Some are designed to support the masonry over fireplace openings, thus replacing ordinary lintels.

Responsible manufacturers of fireplace equipment usually offer assistance in selecting a suitable damper. It is important that the full damper opening equal the area of the flue.

A smoke shelf prevents downdraft. It is made by setting the brickwork at the top of the throat back to the line of the flue wall for the full length of the throat. The depth of the shelf may be 6 to 12 inches or more, depending on the depth of the fireplace.

The smoke chamber is the area from the top of the throat (ee, in the drawing) to the bottom of the flue (tt). As I indicated, the sidewalls should slope inward to meet the flue.

The smoke shelf and the smoke-chamber walls should be plastered
RECOMMENDED DIMENSIONS FOR FIREPLACES AND SIZE OF FLUE LINING REQUIRED

(LETTERS AT HEADS OF COLUMNS REFER TO THE DRAWING)

<table>
<thead>
<tr>
<th>Size of fireplace opening</th>
<th>Minimum width of back wall</th>
<th>Height of vertical back wall</th>
<th>Height of inclined back wall</th>
<th>Size of flue lining required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Width</td>
<td>Height</td>
<td>Depth</td>
<td>w</td>
<td>h</td>
</tr>
<tr>
<td>Inches</td>
<td>Inches</td>
<td>Inches</td>
<td>inches</td>
<td>inches</td>
</tr>
<tr>
<td>24</td>
<td>24</td>
<td>16-18</td>
<td>14</td>
<td>14</td>
</tr>
<tr>
<td>25</td>
<td>24</td>
<td>16-18</td>
<td>16</td>
<td>14</td>
</tr>
<tr>
<td>30</td>
<td>28-30</td>
<td>16-18</td>
<td>16</td>
<td>14</td>
</tr>
<tr>
<td>36</td>
<td>28-30</td>
<td>16-18</td>
<td>22</td>
<td>14</td>
</tr>
<tr>
<td>42</td>
<td>28-32</td>
<td>16-18</td>
<td>28</td>
<td>14</td>
</tr>
<tr>
<td>48</td>
<td>32</td>
<td>18-20</td>
<td>32</td>
<td>14</td>
</tr>
<tr>
<td>54</td>
<td>36</td>
<td>18-20</td>
<td>36</td>
<td>14</td>
</tr>
<tr>
<td>60</td>
<td>36</td>
<td>18-20</td>
<td>44</td>
<td>14</td>
</tr>
<tr>
<td>54</td>
<td>40</td>
<td>20-22</td>
<td>36</td>
<td>17</td>
</tr>
<tr>
<td>60</td>
<td>40</td>
<td>20-22</td>
<td>42</td>
<td>17</td>
</tr>
<tr>
<td>66</td>
<td>40</td>
<td>20-22</td>
<td>44</td>
<td>17</td>
</tr>
<tr>
<td>72</td>
<td>40</td>
<td>22-28</td>
<td>50</td>
<td>17</td>
</tr>
</tbody>
</table>

with cement mortar at least one-half inch thick.

A proper proportion between the size (area) of the fireplace opening, size (area) of the flue, and the height of the flue is essential for satisfactory operation.

The area of a lined flue 22 feet high should be at least one-twelfth of the area of the fireplace opening. The area of an unlined flue or a flue less than 22 feet high should be one-tenth of the area of the fireplace opening.

From the table, you can determine the size of lining required for a fireplace opening and the size of opening to use with an existing flue.

MODIFIED FIREPLACES are manufactured fireplace units.

They are made of heavy metal and designed to be set in place and concealed by the usual brickwork or other construction.

They contain all the essential fireplace parts—firebox, damper, throat, and smoke shelf and chamber. In the completed installation, only grilles show.

Modified fireplaces have two advantages.

Because the correctly designed and proportioned firebox provides a ready-made form for the masonry, there is less chance of faulty construction and more chance of a smokeless fireplace.

Properly installed, well-designed units heat more efficiently than ordinary fireplaces. They circulate heat into the corners of rooms and can deliver heated air through ducts to upper or adjoining rooms.

The use of a modified fireplace unit may increase the cost of a fireplace, although manufacturers say that the labor, materials, and the fuel it saves offset any additional cost.

You need not use a unit merely to insure an attractive, well-proportioned fireplace. You can build an equally attractive and satisfactory masonry fireplace if you plan carefully.

Even a well-designed modified fireplace unit will not operate properly if the chimney is inadequate.

Along with their beauty, pleasure, and comfort, fireplaces may have hazards and shortcomings.

Formation of creosote in the chimney is common and is likelier in cold than in mild climates. Green wood may contain as high as 40 percent water; dry wood, 15 to 20 percent. Wood burned slowly gives off acetic and pyroligneous acid, which in combina-
of ventilation for the interior. New
calking and weatherstripping tech-
niques now can make a house so tight
that there are few air inlets to provide
air for draft such as fires need; the
result is that the unlighted fireplace
becomes an inlet for outdoor air neces-
ary to fuel burning equipment needing
oxygen. Then when the fireplace is
lighted, the draft down the chimney is
likely to drive smoke into the room.
Opening a window an inch or two
may let in enough oxygen so the fire
will burn satisfactorily. (ARCHIE A.
BIGGS)

Paneling

Paneling of wood and other materials
is versatile, easily applied, decorative,
and utilitarian.

It is excellent for new construction,
remodeling, and redecorating.

It can be had in hundreds of differ-
ent combinations of materials, styles,
textures, colors, and finishes that en-
hance the beauty, warmth, and use-
fulness of any room, whether a
luxurious living room, a rustic recrea-
tion room, or a workshop.

Prices per square foot range from
10 cents to 3 dollars, according to the
type of material and finish.

Panels are easy to handle, apply,
and maintain. You need only a few
tools. Many applications require only
a few cuts and glue or nails to hold
the paneling in place. An occasional
wiping with a damp cloth (and mild
soap or detergent) keeps it clean.

You can make use of the grain,
figure, or parallel lines of the paneling
to create effects you like.