clutter. If one storage unit can be made to answer several needs, for example, it is preferable to several smaller items.

PLANNING AIDS: Planning is probably the most important part of building, remodeling, or improving a bathroom, or any room. For help in planning and collecting ideas and information, there are numerous home magazines to consult, as well as planning literature put out by all the leading manufacturers.

Bath shops, often associated with plumbing shops, are an excellent place to browse. They can give you a sense of the range of possibilities available and enable you to visualize how various things would fit together.

Department stores also will often have bathroom accessories and aids in stock.

For a wealth of imaginative ideas on what your bathroom could be, consult: Hicks, D., *David Hicks on Bathrooms,* New York: World Pub., 1970; and Gilliatt, M., *Bathrooms,* New York: The Viking Press, 1971.

A useful source of detailed information is Kira, A., *The Bathroom: Criteria for Design,* New York: Viking Press, 1975; also: Schram, J. F., *Modern Bathrooms* (A Sunset Book), Menlo Park, Cal.: Lane Books, 1968.

Cozy Fireplaces, Franklin Stoves, Other Heaters

GATHERING at the fireside for comfort and fellowship is a custom as ancient as the use of fire. When fireplaces were developed, families cooked all of their food there and much fuel was used. Now, the situation is different. Fireplaces, long appreciated for their esthetic value, are being looked to as a source of supplemental heat, for use on chilly fall mornings when the central heating system is turned off, or during emergencies.

If you yearn for a fireplace, you can build one of masonry, with or without a metal lining, or use a prefabricated metal fireplace.

A fireplace consists of a non-combustible firebox in which the fire is built and by which heat is reflected into the room, a chimney to vent products of combustion, a damper which regulates the amount of air drawn to the burning fuel, and a hearth which extends out into the room from the fireplace.

A fire screen across the fireplace opening and a spark arrester on top of the chimney keep sparks from setting the house afire.

The masonry firebox should be at least 8″ thick if the fireplace is on an inside partition, or if at least 2″ of fire brick lines the firebox. Use at least 12″ of masonry if the chimney is on an outside wall.

Fireboxes range from 1′6″ to 6′0″ in width, 1′9″ to 3′0″ in height and 1′4″ to 2′4″ in depth. A small or medium sized fireplace will provide comfort and use only a moderate amount of fuel.

A tight, well-built and well-maintained flue which is smooth inside is essential for your safe use of any fireplace, furnace or heating stove in which wood, coal, liquefied petroleum gas, fuel oil or natural gas is burned.

If you install a fireplace or heating stove, connect it to a new brick or stone chimney which has a clay tile flue liner, use an existing flue which is in good condition, or use a double-walled metal flue filled between walls with asbestos.

Be sure to comply with all building codes which apply to your community when you install a fireplace, heating system, and chimney. Codes provide for your safety and protection. They are enforceable and govern in disputes.

If you live where earthquake construction is required, reinforce and an-

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chor the chimney as required by the code.

Optimum height of the flue above the roof will vary with the design and height of your house.

The top of the chimney must be at least 4′ above the roof ridge of a house with a pitched roof, and should be at least 6′ above a house of more than one story with a flat roof, and 8′ above a one story house which has a flat roof.

Choose a flue of adequate size, equal to at least one-tenth of the fireplace opening for chimneys more than 15′ tall, and at least one-eighth of the area of the fireplace opening for chimneys less than 15′.

Pipes connecting free-standing stoves and fireplaces to a chimney should be at least No. 24 U.S. Standard gage steel, Underwriters' Laboratories listed, and installed in accordance with the listing. No pipe should be longer than 10′, or more than 75 percent of the vertical height of the chimney, whichever is less.

Each fireplace needs its own flue, but more than one flue may be located in the same chimney.

Wall-hung chimneys and fireplaces are apt to put undue weight on walls and partitions, cause settling of floors and walls, and cause masonry flues to crack. A masonry chimney should rest on its own foundation, below frost line.

The hearth in front of the fireplace should extend into the room at least 16″, and on either side of the fireplace opening at least 8″. Use brick, stone, tile, concrete or other non-combustible heat-resistant material at least 4″ thick for the fireplace hearth.

Protect the floor or sub-floor beneath a factory-built fireplace by a hearth which extends at least 16″ on all sides of the unit and is at least ⅜″ thick.

A conventional masonry fireplace opens on just one side, but you can build a fireplace which opens on more than one side, and build it to harmonize with the architectural style of your house.

A modified fireplace is one with a steel liner at least ¼″ thick, which may replace a firebrick lining in a firebox. Fresh air which enters from the room or from outdoors, is warmed in an air chamber behind the firebox and circulated to adjoining rooms or upstairs through registers.

A modified fireplace equipped with a fan will help to circulate warm air effectively.

The metal lining of a modified fireplace may eventually rust out, and the advantage of circulating heated air through registers may be reduced or lost.

Prefabricated metal fireplaces and chimneys should be labeled as approved by the Underwriters' Laboratories (UL) and installed as specified by the instructions.

Prefabricated fireplaces cost less than masonry fireplaces but they may be less durable.

Metal fireplaces are available in black or colored finishes, and in varying sizes and shapes. A small cone-shaped prefabricated fireplace may be 30″ or 36″ in diameter. If you build in a metal fireplace, be sure to thoroughly insulate it from the surrounding walls, according to the UL instructions.

The Franklin Stove is an ancestor of the coal and wood heating stoves now treasured by their owners. In 1744, Benjamin Franklin promoted the use of a metal fireplace, now known as the Franklin Stove. The stove, which stands out in the room, radiates heat from all sides, and is more efficient than a fireplace. It can be vented through a chimney or a fireplace, when the fireplace opening is closed with just space for the stovepipe to enter.

Doors of a Franklin Stove can be opened when you want to use it as a fireplace, and closed when you use it as a stove.

Experienced architects, builders, and masons in your community can advise you on the design, construction and cost of a fireplace best suited to your needs. Prefabricated fireplaces and accessories are sold by heating and building supply stores and by department stores.

Fuels and their present and predicted

Top, Franklin Stove. Above, prefab metal fireplace.

availability are of importance, as you make a choice of supplemental heating. Plan to use the fuel which is now most readily available and which will probably continue to be available for a long period of time.

Your choice of fuel will determine the type of supplemental heating equipment you will need to have. All fuels which burn require venting of the products of combustion through a chimney.

Wood, coal and natural gas can be burned in fireplaces, Franklin stoves and circulator heaters. These fuels, liquefied petroleum gas, and fuel oil can be burned in circulator heaters.

Fuels vary in their capacity to produce heat, and burn with varying efficiency. One pound of coal has a potential of 12,000 BTUs (British Thermal Units) and burns with 50 percent efficiency. One gallon of fuel oil burns with 70 percent efficiency and has a potential of 140,000 BTUs. One Kilowatt Hour of electricity has 100 percent efficiency in a resistance heating unit in the room in which it is used, with a potential of 3,413 BTUs.

One cubic foot of natural gas has a potential of 1,000 BTUs and burns with an efficiency of 80 percent.

Pound for pound, dry, heavy hardwoods have about half the heating value of coal and a third the heating value of oil.

You can make "logs" of rolled newspapers to burn in your fireplace.

Roll many thicknesses of newspaper tightly around a sturdy broomstick to make a log as thick and long as you need. Fasten a wire or tie a string near each end of the log. Pull the broomstick from the roll. You can then burn the log, or process it further by soaking it in water overnight.

Add a tablespoon of detergent to the water to assist soaking and compaction and to reduce the amount of fly ash produced when the log is burned.

Knead the log with your fingers to make it more compact, when you remove it from the water. Dry the logs in a flat place for several weeks before using them.

Keep flues in good condition at all times. Clean an existing flue before using it and frequently thereafter. Tie a rope to a weighted cloth sack filled with straw and lower and raise the sack in

the flue to loosen soot, ashes and any creosote which may have formed in the chimney.

Creosote is formed by a combination of moisture from burning wood and acids given off when wood burns slowly. Green wood contains much more moisture than dry wood. To remove creosote from a flue safely, chip it from the inside of the flue with a blade fastened to a long pipe.

Remove bricks, stone and mortar which may have fallen into the flue.

Build a very small fire in the fireplace and cover the top of the chimney. Use chalk to mark mortar joints where smoke seeps from the chimney. Point up the mortar joints and replace broken, eroded, or porous stones and bricks.

Install a metal spark arrester on the chimney top. Make needed repairs to metal flashings which protect areas where the flue goes through the roof.

You can become an expert fireplace manager, and here's how:

Lay a fire carefully. For kindling, use a few small branches with the bark cut into curls along the sides. Lay medium sized pieces of wood above the kindling and a few larger pieces of wood on top of the fire. Lay the fire toward the center and back of the fireplace, leaving space for air to circulate around and between the wood.

Place a tightly rolled and tied piece of paper in among the kindling and light it. In cold weather, you may want to light one end of a rolled paper and hold it, with extreme care, just below the open damper in the top of the firebox. Hold it there a few seconds to warm the flue so that it will draw well. Then tuck the lighted paper in among the kindling at the base of the fire. Close the firescreen quickly. Fan the blaze gently if necessary, until the wood burns readily.

A fireplace fire requires about five times as much air as is needed for liberal ventilation, in order to keep burning. You may need to open a window slightly to bring in enough fresh air to keep the fire going, if your house is insulated and completely weatherstripped.

To keep smoke from entering the room, turn off kitchen and bathroom exhaust fans and close registers of forced air heating systems which are near the fireplace.

After the fire is well started, adjust the damper to control the draft, so that there is enough to keep the fire burning but that the amount of heat escaping up the chimney is kept at a minimum. Fireplaces are only about 15 percent efficient.

Use only enough fuel to keep the fire as hot as you need. The heated firebox will reflect heat, and glowing coals add comfort.

You may want to use electric heat. You can use portable heaters, add built-in or free-standing units to your present house, or install an electric heating system in a house being built. Electric heat requires no venting.

Look for portable heaters or baseboard units which have automatic thermostats, fans, over-heat safety devices, and tip-over safety switches. In hydronic baseboard units, water is heated electrically.

Thermostatically controlled electric heating units of varying heat capacities, with or without fans, can be recessed in walls, ceilings, or floors.

Heaters can be installed in the ducts of a forced air heating system.

Electric fireplace units have "logs" and motor driven cylinders which create the effect of burning flames. Some of these units have fans and heating units.

Units are available for use with both 110–120 volt and 220–240 volt circuits.

All electrical heating equipment should carry the UL label and be used as recommended.

Natural gas "logs" are also a quite favored means of heating. The "logs" retain and reflect the heat from the fireplace. Look for the AGA (American Gas Association) label. Be sure to install and use the "logs" according to instructions.

FOR FURTHER READING:

U.S. Department of Agriculture, *Fireplaces and Chimneys*, F 1889, Office of Communication, Washington, D.C. 20250, 1971.