

# UI Extension Forestry Information Series

## Wood-Burning Furnaces

*Roy Taylor*

If you're thinking of heating your entire home with a wood stove, you'll probably be disappointed. A wood-burning furnace rather than a stove is the wiser purchase.

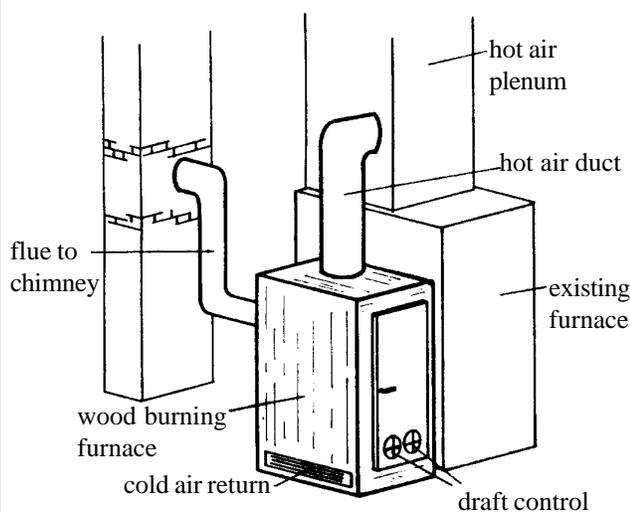
Wood stoves are good for heating small houses or one or two rooms, but most homes are designed for central heating with a furnace. Some wood furnaces are made to fit a hot air duct system, others a hot water system.

Knowing something about what it takes to operate a wood furnace may help you decide whether or not to invest in one. You'll have to work harder to keep the wood furnace going than you would with a gas or oil burning furnace. If you're cutting your own wood, the splitting, stacking, and hauling can be tiring and time consuming. Also, while wood can be purchased from dealers already cut and seasoned, buying large amounts of prepared wood can be expensive.

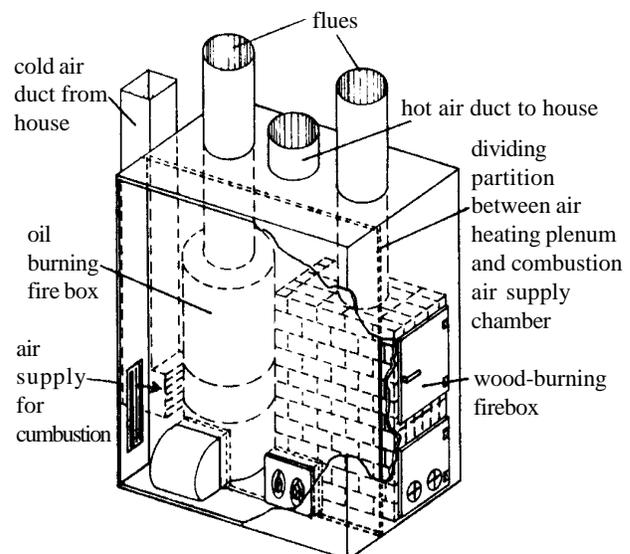
Furnaces require periodic stoking, as often as every 10 hours. A wood furnace connected to the ductwork of a conventional furnace can be used to heat the entire house. Thermostatic controls can activate the conventional furnace when the wood fire dies out (Figure 1). Some furnaces have dual heating chambers with the wood-burning side connected thermostatically with the conventional side (Figure 2).

Two methods for easing the care required of wood-burning furnaces are the self-feeding wood hopper and the wood-burner/thermal-storage units. Self-feeding wood hoppers hold larger wood supplies than ordinary furnaces. As the long pieces of wood burn off on the lower ends, gravity causes them to slide down so that new fuel gets into the combustion zone. Figure 3 shows an inclined hopper capable of holding several large chunks of wood up to 4 feet long.

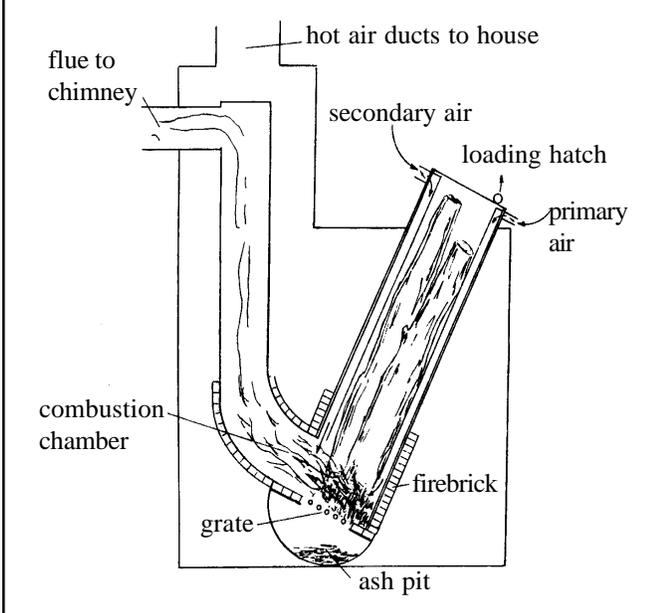
**Figure 1.** Wood-burning furnace attached to conventional furnace/air-duct system.



**Figure 2.** Cutaway of two-fuel furnace.



**Figure 3.** Log burning furnace.



Furnaces can be thermostatically controlled. When heat is demanded by the thermostat, the air supplies are fully opened so that the fire will burn at a high rate. The furnace is equipped with a blower that circulates the heat throughout the home.

A wood furnace requires more maintenance than a gas or oil burning furnace. You must remove and clean the chimney periodically to cut down on the accumulation of soot and creosote.

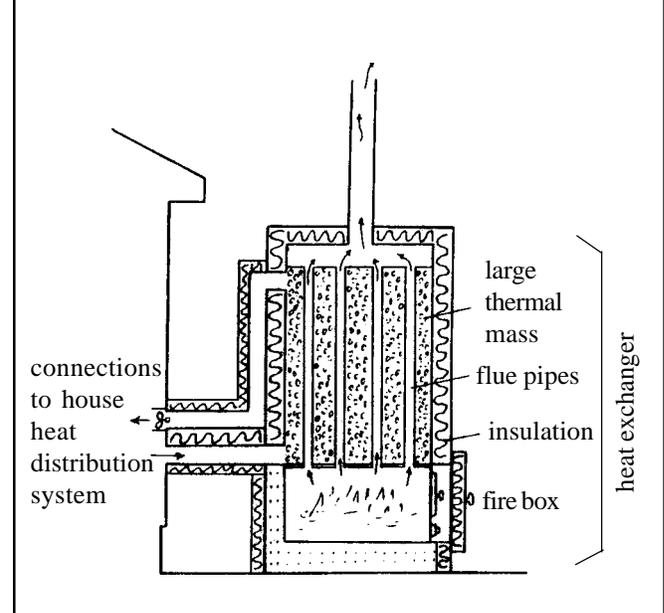
This information first appeared as CIS 482 and was part of the *Wood as a Fuel Series*.

**About the Author:** Roy Taylor is a former Extension Educator - Agricultural Engineering and Professor at the University of Idaho.

Figure 4 shows a self-feeding wood furnace designed at the University of Maine. Characterized by improved air and temperature controls, this furnace achieves particularly high burning efficiencies.

Wood-burner/thermal-storage units are designed to burn wood at efficient high temperatures for short periods of time. Heat is stored in insulated water tanks or rock storage bins and used as needed to heat the house. An advantage of this system is that the furnace does not need to run continuously, perhaps only every 2 or 3 days. The burner and storage unit are usually located outside of the house with pipes or ducts connected to the house's heat distribution system (Figure 5).

**Figure 5.** Wood-burner/thermal storage unit.



**Figure 4.** High efficiency stick-burning furnace.

