

## "Towering" Outside Furnace

"The up and down design of this outside furnace creates an upward draft that eliminates the need for a fan and burns cleaner and hotter," says Leslie Blevins, Lawrence, Kan., manufacturer of the Leslie Firebox, a tall outside furnace designed to burn wood, straw bales, compacted paper bales, tires and just about anything else you can get into its big door.

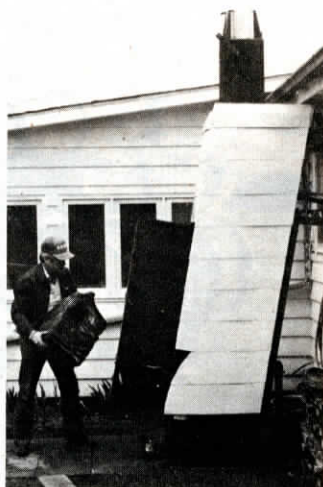
Blevins built his first furnace 8 years ago for use on his own home. "I wanted to keep the fire outside but I wanted a more efficient burner than the outside furnaces I'd seen on the market. This 8 1/2 ft. tall, 2 by 2 ft. stove burns almost anything," says Blevins.

The stove burns hot because of the up and down firebox, which is 18 by 18 in. and 5 ft. tall. Fresh air is drawn in at the bottom of the stove and increases in velocity as it moves up the tall firebox. Another key to success of the stove is the heavy steel firebox lined with firebrick. Blevins says the stove weighs more than a ton, including 1,000 lbs. for the firebox and 1,000 lbs. for the brick that lines it.

"The firebrick reflects heat inward, developing super-hot temperatures that more completely burn whatever you feed into it. It'll burn old tires with almost no smoke out the top," says Blevins.

Heat from the firebox rises up through three large copper coils. Water circulates through the coils, picking up heat from the fire and carrying it into the house to either the hot water heating system or to radiators installed in forced air ducts.

"It kicks out over 200,000 btu's per hour, enough to easily heat a 2,000 sq. ft. house,"



says Blevins. His stove can also be used as a smoker during summer months. The Leslie Firebox sells for \$2,150, not including the flue pipe and the 165 firebrick that line the firebox. Blevins says they can be purchased locally and easily fitted to the firebox. The stove can be ordered with either hot water coils or a forced air heat exchanger. An optional forced air draft fan, which makes it easier to burn bales of straw and other crop residue, is available. Both draft fan and dampers can be controlled thermostatically.

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## Outdoor Furnace Heats Seven Buildings

By Dee George

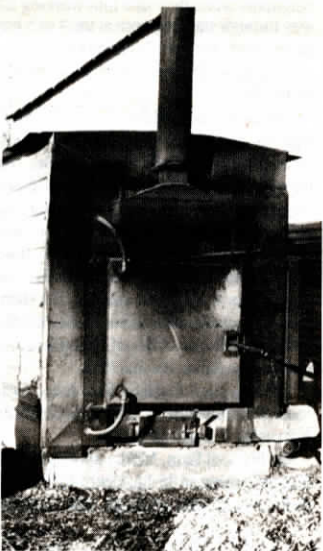
"It keeps the fire outside and that's number one as far as I'm concerned," says Orville Rach, about his giant hot water furnace. He's used it for three years to heat two homes, two shops, a calf barn, a milking barn and parlor, and a garage.

Rach's furnace has a 36-in. wide by 60-in. long by 42-in. high firebox made of 3/16-in. steel. It's surrounded by a larger, 4-ft. wide by 8-ft. long, 5 1/2-ft. high box of 1/8-in. steel. The chamber between the two is filled with 800 to 900 gal. of water. Even the door on the firebox is double and water-filled, keeping it cool enough to touch and preventing it from warping. Rach wire-welds everything carefully so it's leakproof.

Water pumps at the back of the furnace pump water that comes off the top of the stove through 3/4-in. copper pipes that are insulated and run underground to the buildings. Inside the buildings, water runs through radiators then back through a pipe that returns it to the bottom of the furnace. "We have five water pumps pumping water to our seven buildings. One pump pumps water through 900 ft. of pipe to a trailer house and back," says Rach.

His furnace also features openings in the bottom for grates and an ash compartment below for easy cleaning. Four 4-in. flues over the firebox draw smoke up the chimney.

A forced draft regulates the heat. It's operated by a thermostat set at 180°. "When the water temperature goes down, the forced draft starts. I just have to tend to the fire itself. I've added a second draft that puts more air on top of the fire to give it oxygen to burn the gases off the wood."



Inside the buildings Rach turned ordinary used car and truck radiators into effective heaters. "Truck radiators work best," Rach says. "You get more heat off them, but car radiators work too."

Each building has a heat set-up to match the need. In the house an automobile radiator is fitted into the plenum of the oil furnace. The fan in the furnace distributes the hot air. In one of the shops, two auto radiators are boxed in with a large squirrel cage fan. In the calf barn, a car radiator simply hangs from the ceiling with a 20-in. house fan behind it. Heat in some of the buildings is controlled thermostatically



## "Earth Shelter" Furnace Burns Whole Car Tires

"Even in the coldest weather, it only takes two or three tires a day to keep my workshop nice and warm," says North Dakotan Lloyd Twite, of Minot, who gets "free" heat by burning whole tires one at a time in his home-built, earth sheltered furnace.

Twite's workshop is a 12 by 16 ft. building made of corrugated metal siding. To build the earth-sheltered stove, he first constructed a 16 ft. long burning chamber that sets on the ground and runs along the entire north side of the building. The chamber—made of 1/4 in. sheet metal supported by vertical studs made of old metal pipe and spaced 2 ft. apart—is 20 in. wide and 5 ft. high. The building's north wall serves as one side of the chamber.

At one end of the chamber, a "revamped" 200 gal. fuel oil tank serves as a 2 x 4 ft. firebox. It's equipped with a 10 x 30 in. vertical hinged door through which Twite can roll whole car tires directly into the firebox. At the opposite end of the 16 ft. long chamber is a 1 ft. dia. round metal chimney. The entire chamber is covered by a huge mound of earth which pushes up against the building's entire north wall.

The fuel supply—a pile of old car tires—is stored outside the building. Twite brings the tires inside the shop a few days ahead of time to dry them out before they're rolled, one at a time, into the firebox. He uses straw to start each tire on fire.

Heat from the firebox follows the entire length of the chamber and is trapped by the mound of earth, which forces it into the shed's metal wall to warm the shop's interior. "Each tire burns smooth and steady for two to three hours, and its heat stays for several hours afterward," says Twite. "In the coldest weather, I only have to burn two or three tires each day."

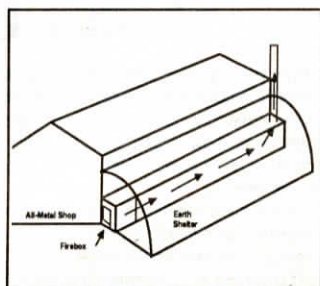
Twite shovels out the ashes each day and sifts them through an 8 ft. square flat screen. He scatters the fines in a field and throws

while others are operated manually.

Rach feeds the wood fire two or three times a day. The 5-ft. long firebox with a 32-in. opening accommodates most any size log.

Rach says the cost to heat the 7 buildings is about equal to heating his house alone with electric heat. Even though the water pumps run constantly, they use little electricity. "I put a meter on the water pumps and they each cost only \$4 a month to operate."

The furnace is so well insulated, snow



the larger pieces into the garbage. He says he plans to install a grate and drop pit for collection of ashes and metal tire beads. "That way, I won't have to bother with ashes all winter long."

If his shop building was longer, say 40 ft., Twite says he would still run the chamber the full length of the building. "The farther the heat travels, the more efficiently it's used up. Even with my 16 ft. long chamber, it's amazing how much heat escapes through the chimney."

Twite collects free car tires from area scrap piles, tire dealers and gas stations. He notes that, for a larger building, the chamber and firebox could be made large enough to accommodate whole truck tires. So far, he has burned only car tires. "To burn wood or coal, I'd need a firebox with a larger draft opening. A nickle-size opening, plus a loose fitting firebox door, is all the firebox draft I need to burn car tires."

Twite says he's considering adding water pipes to conduct heat. "An earth sheltered, tire-burning furnace like this could easily be adapted to heat a house," he feels. "A water pump could deliver heated water through pipes into a radiator inside the house."

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piles up on the steel roof of the enclosure that surrounds the furnace. Rach has built and sold several of the furnaces to neighbors.

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Story and photos reprinted courtesy The Land Magazine, Mankato, Minn.