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Popular Mechanics

Step-By-Step Manual
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861,000-MILE REPORT

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Housing

A wall of water

Wood frame construction lacks the thermal mass of masonry, which can retain and reradiate the heat of the sun. Therefore, going solar in a frame building has often required an active solar system.

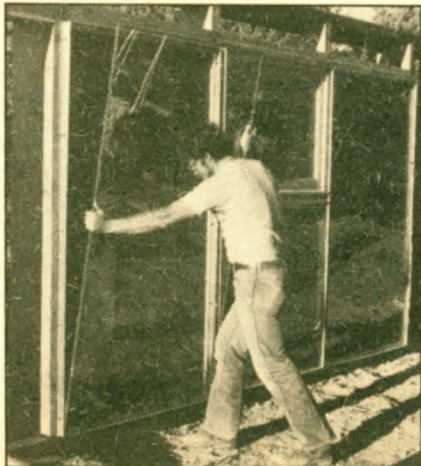
Now there's something called Heatwall. It is a modular, water-loaded, unvented trombe wall that brings the advantage of passive solar heat to the south-facing walls of "stick builds." It is also usable in retrofits. And it does something few passive elements do—it qualifies for tax credits, since it isn't structural.

The Heatwall is essentially an aluminum tank with five compartments to hold plastic water bags. Two people can fit it into a 2 x 12-in. stud wall, and secure it with eight screws. The water chambers are then filled from a garden hose and sealed.

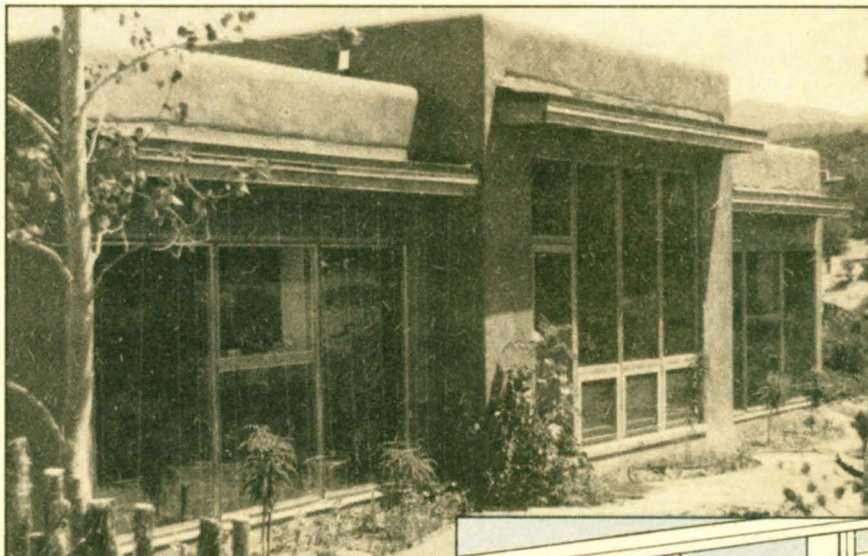
Glazing is done on-site, using standard PPG patio door replacement panels or Exolite double-skinned acrylic plastic. Both are relatively inexpensive double-glazing systems. Heatwall units serve as their own mullion system for the glazing, so no additional frames need be built.

On the in-facing side of Heatwall, standard sheets of wallboard can be affixed with mastic then taped and painted to match the room.

For heat collection, a black sur-



Standard patio glass or Plexiglas fits Heatwall opening. Units can be retrofitted, with adjustments, to frame homes.



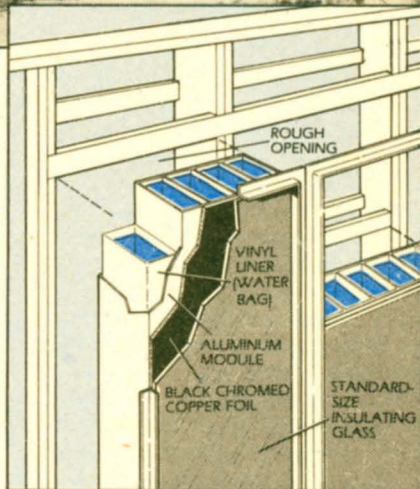
New Mexico home has a Heatwall on south side. Strings on left are for climbing vines that give summer shade.

face, in this case black chrome plated to copper foil, is used. This "selective surface" acts as a one-way mirror to heat. Rated for .93 absorption and .11 reflectance, it allows the sun's energy to pass easily to the water storage, but retards the heat's reradiation to the cool night air.

Water stores about 62 B.T.U./per cu. ft./per degrees F. of temperature rise. The water capacity of the compartments in Heatwall is calculated to get no hotter than the 90° to 100° F. This seemingly low temperature range (for a heating system) is effective because people surrounded by surfaces close to their own body temperature don't lose significant body heat to those surfaces. Thus, they retain their sense of comfort. The effective radiation from Heatwall extends up to 20 feet from the wall.

Tests indicate that one Heatwall is adequate to heat an average room. Three to six units can provide a 1000-sq.-ft. structure with 54 to 80 percent of its heat, depending on the climate. The solar-saving fraction of 54 percent is taken from a test structure with six Heatwalls in the Chicago area. The 80-percent figure is from a four-Heatwall structure near Albuquerque, N.M.

Heatwall was observed at the Los Alamos (N.M.) Scientific Laboratory for seven weeks starting in January 1981. With average weekly outside



temperatures ranging from 28° to 41° F., the unit achieved a solar savings fraction of 76.8 percent.

Besides the full-sized 4 x 8-ft. Heatwall, there's a half-wall partner designed to team up with a Marvin awning-opening window. And there's a matching frame for a full-sized window that also uses the PPG glass patio replacement glazing. Heatwall modules can be mixed and matched to provide a southern exposure with a variety of direct and indirect solar gain, ventilation, daylight, doors and views.

Full-sized Heatwalls cost \$785; the half-wall is \$630 and the frame for a direct-gain window is \$97 (plus on-site glazing).

For information, contact the Heatwall Co., 5001 East 59th St., Kansas City, Mo. 64130, or Wayne Nichols, Communico, No. 2 La Vereda, Santa Fe, N.M. 87501.