



Wooden "pump handle" serves as a lever to pull chainsaw rope, which slips through a metal ring on end of handle.

Push Start Your Chainsaw

"My 98-year-old dad still heats his house entirely with wood but has trouble starting his chainsaw. His problem is that he can't yank the pull cord fast enough to start the saw," says Dennis Hammer of Fonda, Iowa.

To solve the problem, Hammer made his dad a 26-in. high wooden table with some hold-down clamps and a wooden "pump handle" that serves as a lever to pull the rope. A 1/2-in. bolt serves as the pivot for the handle. The saw's pull rope slips through

a metal ring on the end of the handle.

"You just push down on the lever to start the saw," says Hammer. "It gives my dad the extra leverage he needs. Simple ideas like this can take some of the frustration out of growing old."

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Tire water tank comes with insulated tank cover. Water circulates up through a 10-ft. long plastic culvert placed vertically into the ground below tank.

"No Power" Water Tank Never Freezes

Bud Williamson combines an insulated tank cover with heat from Mother Earth to keep his water tanks free of ice. No extra heat or circulation is needed with his all-natural system.

"Stock tank heating systems, whether

propane, wood or electric, cost a lot to run, are high maintenance, and are a safety issue," says Williamson. "We saved \$2,500 a year in electricity alone by getting rid of our electric tank heaters. With our Geothermal Rubber Tire Tank Insert, no matter what the weather,



"Capture the Heat" unit uses engine exhaust to heat buildings. Exhaust enters box filled with baffles, then exits out the bottom and is piped outside.



They Put "Waste" Engine Heat To Work

A "Capture the Heat" unit from M&R Welding is a great way to heat a shop with engine exhaust. The heat exchanger comes in 2 sizes and is designed for use with gas or diesel engines being used to power various equipment or drive electric generators.

"They give full heat within 10 to 15 min. of starting the engine," says Marvin Hochstetler, M&R Welding.

The MX150 is for engines up to 150 hp., and the MX300 is for engines from 150 to 300 hp. The smaller MX150 has been used for engines as small as 25 hp.

The Capture the Heat unit is a simple box with baffles on the inside. Exhaust enters the box at an upper corner, passing around and heating baffles as it goes. It exits out a lower corner opposite the entrance point and is piped out of the building.

Hochstetler points out that the system can

be adapted. Some customers have built a filter box around the fan inlet to filter the air before heating it.

"Capturing the heat doesn't cost anything," says Hochstetler. "It doesn't take any more fuel."

While the unit is intended as a supplementary heat source, captured heat can be significant, notes Hochstetler. "You can heat a 42 by 75 by 16-ft. building if an engine is running most of the time."

Hochstetler says some customers with well-insulated shops report producing enough heat during the day to keep it warm all night.

The MX150 is priced at \$1,100, and the MX300 is priced at \$1,300. That price includes a fan, but no motor.

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our water systems are operating."

Williamson runs cattle on his own ranch and does consulting with other cattlemen, setting up grazing systems. That means designing, if not also installing, fencing and watering systems.

"We figured there had to be a better way, so we developed one and have spent the past 3 1/2 years fine-tuning it," says Williamson.

Williamson started with the standard large rubber tire tank that is popular on a lot of livestock operations. Most include a standard float system tied to a valve on a pipe stub sticking out of the concrete base. He added a 10-ft. long, 3-ft. dia., length of heavy-duty plastic culvert insert to the concept.

With Williamson's system, the insert is placed vertically 10 ft. into the ground with the rubber tire tank above it. The water pipe is brought into the culvert at the bottom, delivering 52-degree water. As it circulates up through the culvert, which is also conducting heat from the surrounding earth, it naturally warms the water throughout the tank. Even if no new water is being introduced, as water cools at the surface, it drops to the bottom and circulates back up as it is warmed.

A quick coupler valve on the water pipe at the bottom of the culvert, but ahead of the float valve, can be disconnected from above with a one-hand release. While the female end remains inside a vertical pvc pipe, the male end can be pulled out. Any service work on the float or its valve can be done above ground and away from the water and then easily reinstalled.

"With a standard hydrant, if you have problems you have to backhoe out the hydrant," says Williamson. "With ours, drop in a pump, empty the tank and the insert, and you can get in and do the repairs."

Even with the ground-warmed water, extreme cold can shut down a tank at the surface. For those conditions, Williamson devised an insulated tank lid. It consists of a



Scale model of remote valve and float control on water pipe at bottom of culvert.

2-in. thick steel frame with 2 layers of plastic sandwiching a layer of poly insulation.

The lid has multiple opening options from a single door to a combination of quarter and half doors. Some or all can be left open depending on the number of cattle to be watered and the time of the year. A limited access drinking hole lets cattle drink even in subzero weather while leaving other lids closed.

"If you have 20 head and a 12-ft. tank, you may need only one door open, but with 100 head in the summer, you might leave both halves open," says Williamson.

It is in extreme cold that the tank insert and lid system really shine. "We've had tanks sit for 2 winters with no livestock," says Williamson. "You may get some ice buildup around the tire, but not where the float is."

While Williamson's company will install the tanks with lids and inserts, he is also selling the inserts and lids for installation outside his area. Inserts for 9 to 15-ft. dia. tanks sell for \$2,400. Lids for 13-ft. dia. tanks sell for \$2,100.

"We can ship them for a local contractor to install," says Williamson. "We recommend the use of an auger to install the culvert. It creates less disturbance and eliminates the need to compact the soil around the tank."

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