

RUNS CARS, TRUCKS ON ORDINARY WATER

New Fuel Cell To Provide "Limitless" Cheap Energy

One of the world's leading hydrogen fuel experts, who first started powering cars and trucks on ordinary well water some 25 years ago, says his new hydrogen "fuel cell" is the breakthrough that's been needed to produce cost-effective engines for cars, trucks, tractors and other equipment.

Dr. Roger Billings, who runs the non-profit American Academy of Science in Independence, Mo., says hydrogen gas burns fine in ordinary internal combustion engines. The problem is that it costs the equivalent of about \$2.25 per gal. to burn because of the energy required to create the gas, by running electricity through water.

Now Billings says he's solved the problem by taking space-age fuel cell technology and adapting it to car and pickup size power units that'll "burn" hydrogen gas for the gas-equivalent price of \$1.12 per gal.

"We spent years looking for less expensive ways to produce hydrogen," says Billings. "The solution finally came when we looked for a better way to use the fuel."

Fuel cells transform hydrogen and oxygen into water and electricity. There's no pollution generated - the car currently under development "exhausts" water vapor - and the fuel cell has no moving parts, so it's quiet and won't wear out. Electricity produced by the fuel cell is used to power an electric motor which drives the vehicle.

"Fuel cell technology has been around for a long time. Electric instruments on the Apollo moon missions and more recently on the Space Shuttle have been powered by hydrogen fuel cells. The space versions of the fuel cell are too expensive and too heavy for use in a vehicle. This is a case where the space age version of a technology is not good enough for down to earth applications," says Billings.

His breakthrough consists of a new lightweight cell fabricated by high-power laser. The fuel cell will drive a vehicle twice as far on the same amount of hydrogen fuel as hydrogen-powered vehicles in the past. Hydrogen is stored in metal hydride tanks that "absorb" the hydrogen, releasing it as needed to the fuel cell. Driving range of an average size tank will be about 300 miles.

What's more, fuel cells produce their own fuel. By "reversing" the chemical process within the cell, it will split water into hydrogen and oxygen. When the car is parked, you simply plug it into water and



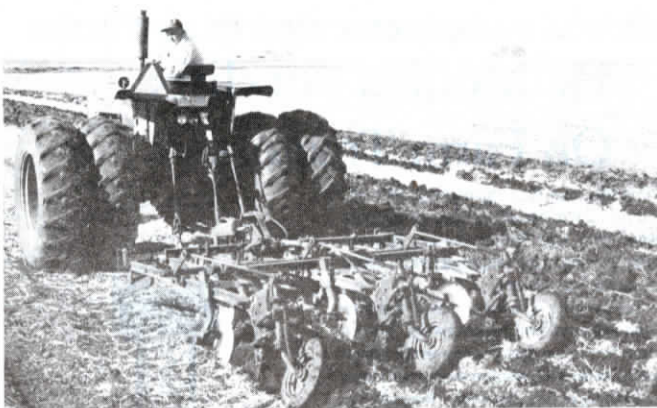
Dr. Roger Billings with his new fuel cell.

electrical lines to produce a new load of fuel overnight. In most areas of the country, Billings says you will be able to use cheaper off-peak electrical power for extra savings. Hydrogen produced under those circumstances could cost as little as \$.46 per gal., he claims.

The new fuel cell is the size of a small television. Billings expects it would retail for about \$3,500. He plans to license the cell to companies that want to commercialize it and is currently installing the first prototype "LaserCel" in a car for the Pennsylvania Energy Office. The car should be up and running by the end of January. Billings is also working with aerospace giant Lockheed to install the fuel cell in an under-water vehicle propulsion system where it would be ideal because it eliminates the need for a bank of heavy batteries.

Billings' hydrogen work has been sponsored for years by private investors, like John K. Hansen, the founder of Winnebago Industries, who invested \$1 million several years ago. The work has been carried on with other private funds and contributions, as well as income from private development contracts.

Contact: FARM SHOW Followup, Dr. Roger Billings, American Academy of Science, 26900 East Pink Hill Road, Independence, Mo. 64057 (ph 816 229-3800).



Old moldboards make great chisel plows because of their rigid frames, high clearance.

CUTS AWAY BOTTOMS TO MAKE POINTS

He Turns Moldboard Plows Into Chisels

By C.F. Marley

An Illinois farmer says he's come up with an inexpensive way to make his own chisel plows. He uses junked moldboards.

Bob Elder, who farms near Chenoa, says old moldboards make great chisel plows because of their rigid frames and high clearance. He mounted three IHC 3-bottom plows side by side, bolting them together into a single frame. Then he used his cutting torch to cut away the moldboards, leaving narrow chisel points. He mounted a hydraulic lift cylinder up front to raise and lower the front end of the trailing machine and left the three rear wheels in place. One drawback is, "I have to crank the rear wheels up and down for road travel," says Elder. The plow retains the spring-loaded hitch that permits the plow to detach if he hits something solid.

The home-built chisel works so well Elder recently started building a second "improved" model. He mounted two 4-bottom IH plows side by side on an old IH disk running gear fitted with large wheels off an old combine. The high-profile wheels give him plenty of clearance to raise the plow out of the ground hydraulically, eliminating the rear land wheels. "I needed the better lift at



Elder used a cutting torch to cut away the moldboards, leaving narrow chisel points.

the ends of fields and going down the road."

He also installed conventional chisel plow points on the old moldboard shanks on this new model but adds that just cutting off the moldboards like he did on the first plow also worked great. Anyone can make a cheap chisel plow that way, he notes.

Contact: FARM SHOW Followup, Robert Elder, Chenoa, Ill. 61726 (ph 815 945-7476).

THEY'LL LAST THE LIFE OF THE DRILL

Add-On Bearings For IH Disc Drills

"Anyone who owns an IH, Great Plains, Melroe or Crustbuster drill wants to buy them as soon as they see them. They sell themselves," says Tom Laubach, distributor of a new center hub assembly that completely replaces factory hubs.

The problem with the bearings on these drills, according to Laubach, is that they don't last. "They're too small. You have to replace them at least three times over the life of a drill. Our bearing assembly will last the life of the drill."

The replacement assembly uses the same bearing used on Deere disk drills and is designed for much easier installation and removal than the factory hubs, which get rusted in place and are difficult to remove

with the screwdriver slot provided.

Also, Laubach says his bearing is placed on the center line of the disc, rather than off to the side as on the factory units, placing less stress on the bearing. It's fitted with the same dust seal used on Deere drills because of its easy availability and long life.

The add-on assemblies can be fitted to both single and double discs. They sell for \$10 apiece. "Replacement bearings alone cost \$6 apiece from IH and they won't last the life of the drill like ours," says Laubach.

For more information, contact: FARM SHOW Followup, Tom Laubach, Drill Disc Supply, Box 8A, Canton, Okla. 73724 (ph 405 886-2259).

New Grease Gun Has Built-In "Bleed" Valve

Most air-powered grease guns have to be taken apart and "bled" if an air lock develops. Not so with the new Fliteway pistol-grip gun which has an air bleed valve built into the top.

If an air lock develops, you simply tap this valve and presto! it's gone—no need to uncrew the canister or anything else.

The new gun can be loaded with standard 14 oz. cartridges, pressure filler, or bulk grease. Sells for \$30.90, plus shipping.

Contact: FARM SHOW Followup, Flite-



way Division, Gardner Equipment Co., 317 Barstow St., P.O. Box 99, Hordicon, Wis. 53032 (Ph 414 485-4301).