Metal plates in Spicer's hydrogen-maker are flooded with water, then charged electrically to split liquid into hydrogen, oxygen.

**IOWAN HAS ALSO LEARNED HOW TO MAKE HIS OWN ANHYDROUS AMMONIA**

# Hydrogen: Making It On The Farm

Lawrence Spicer, a building contractor in Lineville, Iowa, has worked with hydrogen for 15 years. Using the output of his 1,000 watt Jacobs windmill, he produces hydrogen for his part time farming operation at virtually no cost. His self-designed system plugs away 24 hrs. a day, turning rainwater, which has less minerals in it than well water, into gaseous hydrogen fuel and storing it in a 500 gal. propane tank. With only slight modifications, he's burned it in his truck, stove, propane refrigerator, acetylene cutting torch and other farm machines and appliances.

Spicer's hydrogen-maker consists of a small fuel cell, somewhat larger than a car battery. Like a battery, the "electrolyzer" has a series of connected metal plates. The plates are flooded with water and then charged with electrical current. Jumping between plates, the electricity splits water molecules into its two elements — hydrogen and oxygen. Automatic valves separate the two gases, moving the hydrogen to a big storage tank and oxygen to a smaller tank primarily for use with Spicer's cutting torch.

"My 1,000 watt Jacobs generator is small, but working 24 hrs. a day, it produces enough for experimentation with various engines and appliances," says Spicer. He has plans to set up a 15,000 to 20,000 watt hydrogen generating system, which he says would be enough to become energy self-sufficient.

Spicer has found that for some appliances, such as kitchen stoves, small modifications are necessary. For example, he has to fill part of the burner cavity on his stove with steel wool or else the hydrogen pops as it comes out. To avoid the problem of switching back and forth from his limited hydrogen supply to propane, he's now attempting to mix hydrogen with his propane supply.

Spicer is working on another hydrogen project: Producing his own anhydrous ammonia. "Anhydrous ammonia is simply a combination of hydrogen and nitrogen. Once we've made the hydrogen, all we need to do is combine it with nitrogen which is all around us in the air. I'm experimenting with a unit that would combine hydrogen and air in a box and give it an electrical charge. The output would be water, which you get when you combust hydrogen and anhydrous ammonia. This means that once perfected, we should be able to produce a unit for farmers that would produce hydrogen fuel and ammonia for the farm," he concludes.

Spicer uses this 32V Jacob windcharger as the power source for making hydrogen, oxygen.

Spicer sells a set of plans for $10 for building your own hydrogen electrolyzer. He notes that any electrical source can be used, including standard alternating current or solar cells, in addition to free wind power.

Spicer claims that John Lorenzen, Woodward, Iowa inventor featured several times in FARM SHOW for his experiments with powering a car on-the-go with hydrogen, originally built his first hydrogen-maker after seeing Spicer's system.

For more information, contact: FARM SHOW Followup, L.E. Spicer, Rt. 2, Box 262, Lineville, Iowa 50147 (ph 515 876-5665).


New Pioneer drill bands fertilizers and applies herbicides as it plants.

**33,000-LB. DRILL CARRIES ADDITIONAL 25,000-LB. PAYLOAD**

# Giant No-Till Drill "Really Does The Job"

They're calling it the first true no-till drill and the biggest thing to cross the prairie since the buffalo roamed. It's the giant-size new no-till drill from Pioneer Manufacturing which can apply as much as 2,000 lbs. pressure per seed opener while banding phosphates and nitrogen around the seed, and applying herbicides to control weeds.

"Our drill works as well in stubble ground as a conventional drill in fine-tilled soil. We believe it's the first true no-till drill on the market," says Guy Swanson, head of the Spokane, Wash., firm which has had various prototypes of the drill in the field for eight years.

The 20-ft. wide drill features row spacing from 7½ in. to 24 in., seeding with a unique double-disc opener that has a slicing coulter. A "scuffer" disc kicks straw and other debris out of the seed trench ahead of it.

A major feature of the machine is that it allows the use of liquid, gas or dry fertilizer. Phosphate can be planted with the seed, while nitrogen is banded to the side and below. "There's no interference from surface residue as there is with top-dressed fertilizers," points out Swanson. Liberal quantities of herbicides — particularly Roundup, Paraquat, Hoelon, Sencor and Fargo — as well as insecticides, can also be applied with optional equipment.

"We can carry as much as a 25,000 lb. payload on our 20-ft. drill, making it a one-trip planter. Fuel use per acre is cut from an average of 6½ gal. per acre to about 1½ gal. per acre. With the yield increases brought about by increased moisture trapped in the ground — one inch of soil moisture translates into 7 bu. of grain — and the precise placement of our fertilizers, we've calculated about a $40 per acre increase in income with this drill," says Swanson.

"Other benefits, especially when you get into the mountain grain areas of the west, include ten times less soil erosion with the drill and the ability to seed slopes as steep as 55°," Swanson points out.

Three series of the drill are available, ranging from the 10-ft. 15,000 lb. model to the 20-ft. 33,000 lb. biggest drill. Minimum horsepower requirements run from 125 hp. to 270 hp. Prices range from $40,000 for the smallest drill to $135,000 for the largest model outfitted with all options.

For more information, contact: FARM SHOW Followup, Guy Swanson, Pioneer, South 4305 University Road, Spokane, Wash. 99206 (ph 509 922-2958).