

There are very few pictures of our founder, Dr. Harry LaFontaine. Here is his Lincoln Continental gasifier demonstration car with description of gasifiers in WWII.

Tree-Wheeling Vehicles

By NOEL VIETMEYER

Improving on a World War II development, a group of enthusiasts is demonstrating how automobile engines can be powered by wood — or paper bags from hamburger drive-ins.

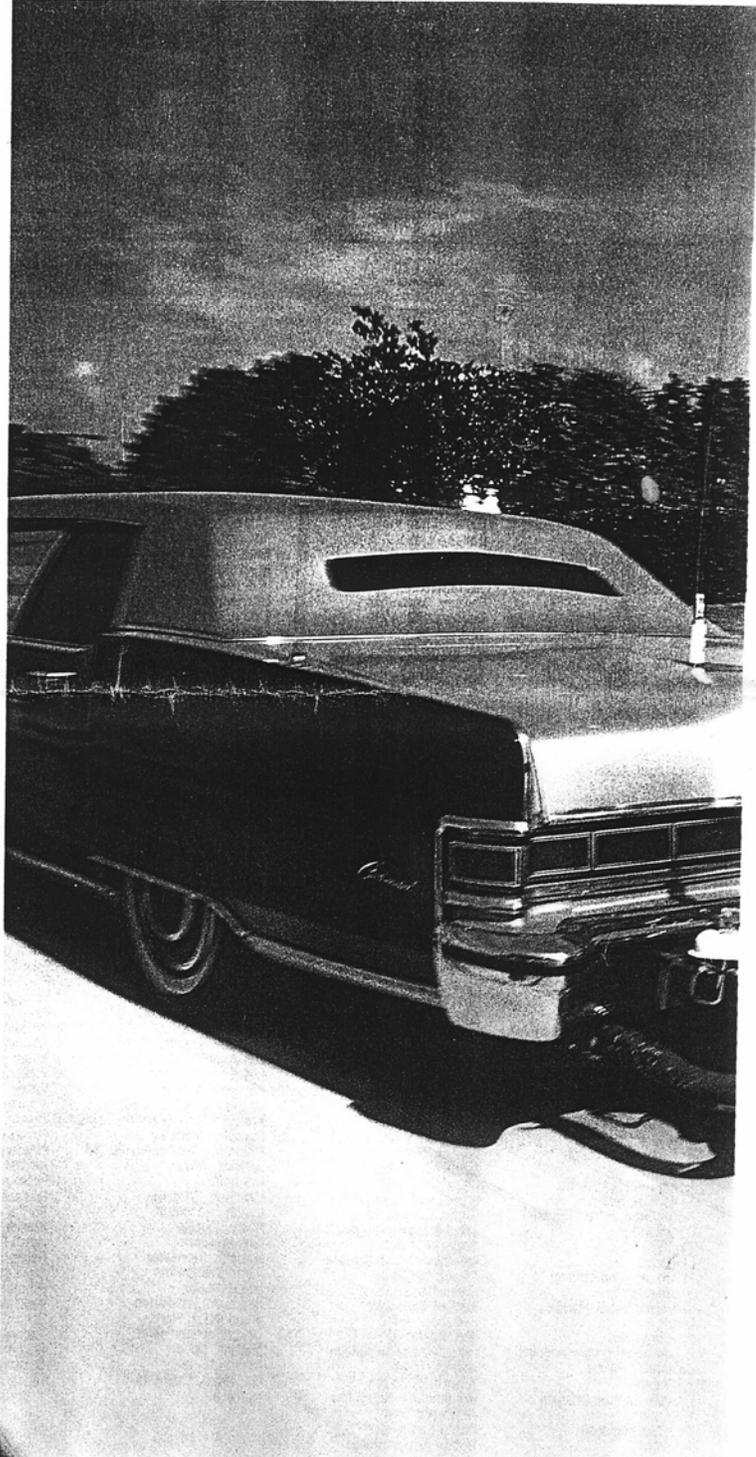
Whenever Harry La Fontaine drives away from his Florida home, heads turn, traffic stops, and people congregate to stare at his car. It's a remarkable vehicle, a long, black-and-gray, custom-built Lincoln limousine, which once starred in a gangster movie. But the onlookers' attention is drawn more to a one-wheel trailer behind the limousine.

With its odd array of pipes and cylinders, the trailer looks strange, but its purpose is practical: It converts wood into combustible vapor to fuel the limousine engine. La Fontaine has turned his Lincoln into a wood burner.

La Fontaine built the trailer because he remembers what happened in 1940 when the Germans marched into his native Denmark. Almost overnight all fuel was withheld from the civilian population. "The Nazis took all the petroleum in the whole nation," he recalls bitterly. "They told us, 'You'll just have to conserve for five months; after that we'll have the war won.'"

That meant that there was no way to bring food into the cities. Within days Denmark

The idea for Harry La Fontaine's wood-burning limo originated in wartime Denmark.



was facing mass starvation. "We buried a lot of people," notes La Fontaine. "The worst were the children and old people. We only had bread, and they couldn't live on that alone."

As one of Denmark's leading young engineers, La Fontaine was put on a panel charged with finding a substitute fuel. Nobel Prize-winning physicist Niels Bohr was the chairman. Soon the panelists had Danish welders building gas generators, stovelike devices that made it possible to power conventional internal-combustion engines with solid fuels. By 1942 more than 20,000 Danish vehicles and fishing boats were running on wood, charcoal, coal, peat, and even compressed seaweed.

After a successful and varied career teaching in universities and building special effects for movies, the rosy-cheeked, avuncular La Fontaine lives in retirement near Miami. He started adapting his Lincoln to wood fuel in 1979. The engine is the same 440-cubic-inch V-eight that Ford installed. Except for removing its carburetor and connecting the engine to the trailer with a gas pipe, La Fontaine did nothing to modify it.

Before starting out in his car, La Fontaine opens the lid of a large cylinder on the trailer and dumps in enough fist-sized pine blocks to take him 120 miles. He stuffs paper into the bottom, lights it, and opens the cap on a small chimney. Initially smoke emerges, but after three or four minutes a clear vapor begins pouring out. To demonstrate the fuel, La Fontaine lights it and a shaft of blue-and-gold flame more than a yard long

shoots up. It resembles a tiny natural-gas well flaring up. He then closes the chimney, climbs into the driver's seat, adjusts a small valve, and engages the starter in the regular manner. This sucks the vapor through a hose and into the engine. The vehicle comes to life.

The vacuum created by the pistons is a key part of the system. The suction pulls a small jet of air through the bed of red-hot coals in the trailer stove. The wood breaks down into combustible gases: carbon monoxide, hydrogen, and methane. The mixture of gases, technically known as producer gas, is cooled, filtered to strip out tars, and mixed with air before it enters the engine. There the spark plugs explode it almost as if it were the usual gasoline-vapor-and-air mixture. Depressing the accelerator pedal creates more suction, builds up the fire in the stove, and generates more gas.

During World War II producer gas was commonly used in Europe, Japan, China, Brazil, Australia, and elsewhere. Companies that built gas producers included Volvo, Saab, Daimler-Benz, Peugeot, Renault, Fiat, and Isuzu. In total, more than a million trucks, buses, tractors, taxis, motorcycles, boats, and trains — with diesel and spark-ignition engines alike — were powered by producer gas during the 1940s. Petroleum eventually became so scarce that German tank crews trained in coal-powered panzers and drove their giant vehicles from the railhead to the Russian front using disposable gas producers. Some Japanese and French taxis remained charcoal powered

into the 1950s.

After the war, drivers were glad to scrap the ungainly, sometimes temperamental gas producers. With gasoline or diesel fuel again available, they no longer had to start a fire before a vehicle would start; there were no ashes, tars, or soot to clean up. And engines develop about 30 percent more power with gasoline than with producer gas.

Today some of the disadvantages of wood-powered cars have been reduced. The devices Harry La Fontaine and a few other pioneers are building with modern materials are smaller, simpler, quicker starting, and much more reliable than those of the 1940s.

It is probably cheaper to run a vehicle on producer gas than on gasoline. La Fontaine's Lincoln gets about one mile per pound of wood. He could drive across the country on about a cord of wood. The cost at that rate is about half that of gasoline. However, in the absence of mass production, the generator could cost \$2,000 or more. And wood is not as easy to find as gasoline.

There is, however, rising world-wide interest in producer gas as an alternate fuel. In the Philippines, 120 vehicles, 150 fishing boats, and about 70 irrigation pumps were converted to charcoal power in 1982. More are being delivered daily. And 15 small charcoal-powered buses are carrying passengers around Manila on regular routes. The Philippine government is now forming a company to build 20,000 gas producers a year.

South Africa has a national producer-gas project. By 1985 it expects to have 10,000 units, mostly for generating electricity from

Before starting a drive, La Fontaine dumps fist-sized pine blocks into a large cylinder on the trailer.

