



# FRONT-DRIVE PACEMAKER

## The Hartz-Miller Special Spawned A Whole Breed Of Racing Machinery

BY GRIFF BORGESON

IT WAS ACTUALLY in early March of 1932 that Harry Hartz came to Harry Miller with a ridiculous announcement.

"We're going to build another front-drive," he said, "in time for the race."

Once Miller had reassured himself of Hartz' relative sanity and ability to foot the cost he shrugged and replied, "Well, the impossible has been done around here before. Maybe it'll happen again. But don't look to me for any big help; I'm going crazy with these new 4-wheel-drive jobs. You and Leo and Fred will have to work it out. There's a shed in the backyard you can use to build the car in."

Leo Goossen still has many of the Hartz-Miller drawings, not just for the engine, but for many of the chassis parts, most of which also were new. Some of the drawings have April dates on them and of course the race took place at the end of May.

"I'll never know how we ever did it," Leo says. "The car had no right to be finished in time and it was a miracle that it qualified. As for winning, well..."

It got done because every man involved was a past master at his job and no one slept, much. Leo bent over the

drawing board days, nights and Sundays. Miller's two old German patternmakers and Fred Offenhauser and his machine shop crew turned the prints into wood and metal while they were still damp. Jean Marcenac was Hartz' chief mechanic on the job and he worked every night until two or three o'clock in the morning and was always back on the job at eight. The whole crew kept this up for weeks because it was the only way to get the car built, and any car that Harry Hartz conceived was bound to be worth the effort.

There was also some volunteer aid. A young mechanic named Jerry Houck hung around and helped. He had been with the Richfield Oil Company's boat racing division and knew his high-performance engines. He had put in a couple of seasons on the AAA National Championship circuit and he'd helped to build some cars. Then he built one on his own, the McClurg Special, which Babe Stapp drove at Ascot. It was such a beautiful machine that it was chosen as Jimmy Cagney's mount for the film *The Crowd Roars*, with Fred Frame doing the stand-in driving for Cagney. Thus Houck worked closely with Frame and Hartz and developed an interest in the unusual Detroit Special. When

Hartz' crash program began at Miller's converted cracker factory, Houck devoted all his spare time to giving Marcenac a hand.

The new engine was an unblown straight-8 with a bore and stroke of 2.875 x 3.5 in. and a displacement of 181.8 cu. in. It had two valves per cylinder. Goossen had long been a devout believer in the narrowest possible included angle between inclined overhead valves and he made the angle on this engine 90°, as opposed to 94° in the classic Miller 91. Unlike previous front-drives, this engine had its gear train at the front. It used four Miller downdraft carburetors which probably represented the height of the art at that time.

The engine's bell housing mated with the front-drive unit of the Detroit Special, which was retained without change. But new, larger, constant-velocity universal joints were added and these required redesigning of the de Dion tube and its kingpin forks. The rear axle, frame rails and many other chassis parts were new and the only other part that Houck is sure was carried over from the Detroit Special was its big, 3-in. radiator filler cap, which he'll never forget.

Hartz had done a great deal of original work in improving and softening Miller's front-drive suspension and this contributed to Billy Arnold's Indianapolis victory in 1930, at the wheel of the Hartz-Miller 155. These improvements were built into the chassis of the new 183. With the car still unfinished, it

was loaded onto a Model B Ford truck which, by driving non-stop, landed at the Speedway on May 14. Houck arrived a day or two later, having made a straight-through run in a similar truck with one of the new Miller 4-wd cars on its bed.

This was late, but not as late as it would seem today. In those days all qualifying was done in one weekend and the following weekdays were open to qualifiers as long as there was room on the starting grid. Nevertheless, the Hartz-Miller needed every day of those two weeks.

The crew finished building the car at the Speedway, which was no great novelty. When they fired up the engine for the first time it would not run below 2000 rpm. Some time-consuming scrutiny of the fuel system revealed that someone had forgotten to drill the idle jets. But this was nothing compared to the big problem: No oil pressure. They checked the gauge and it was good. They tore down the oil pump and still found no pressure. They tore down the oil pump drive and found it to be in order. They tore everything down.

Pit-crew member Al Tyson reasoned that there had to be an obstruction in the crankcase's built-in oil lines so he blew cigarette smoke through them. Smoke came out through the oil pump after being blown through the high pressure line. This line was supposed to dead-end against the bulkhead which separates the crankcase from the oil-pump cavity at the front of the engine but which had been drilled through in error. Finding this and correcting it took three full days of labor, almost around the clock.

The little 151 front-drive was back in shape and Billy Arnold was back at its controls. Hartz planned to drive the new 183 although he had been very inactive as a driver since he had come close to losing his life in a crash at Salem, N. H., four years before. When Fred Frame showed up without a ride, Hartz grabbed him. Houck's confidence in Frame was at least as great and he accepted the riding mechanic's job.

With oil pressure at last, these two got down to practicing. But, at 5000 rpm, the engine began to fire raggedly, showing all the symptoms of ignition breakdown. They went to August Vollmer, the ever-present Robert Bosch representative at Indianapolis, and expressed their doubts about the magneto. Vollmer tested it and pronounced it perfect. But they and crew-chief Marcenac were not convinced and persuaded Vollmer to let them use another magneto. The results were identical.

It was maddening. It had to be ignition, but now it couldn't be. They went through their fuel system thoroughly but could find nothing wrong. There was nothing else to do but go back and

argue with Vollmer. When they did, suggesting that they must have had two bad magnetos in a row, a near riot resulted in the Bosch shack. Marcenac obtained another magneto elsewhere, installed it, and the trouble was cured. This was really in the nick of time since qualifying began the following morning.

The car was put in tip-top shape, which included disassembly and inspection of most of its front end. Frame and Houck took to the track, but soon Houck noticed a slight flutter in the right front wheel and Frame sensed something wrong in the steering. So back they came to the pits for another tear-down. They found that someone had left the right wheel-spindle outboard bearing sitting on top of an oil can, nothing more.

With this corrected and most of the day lost, the car began running like a watch. On the straights the engine would rush up to its peak of 6500 rpm and wind on out to 6800 effortlessly and with the cleanest ripping-canvas sound ever heard. Frame was hurtling down the back stretch flat out when the engine ran away with an almost supersonic scream. The driver's reflexes were sharp and it took him only a second or two to lift his foot and hit the kill button, but by that time the crank had turned a million rpm. He and

Houck exchanged heartbroken looks and, expecting the worst, coasted to the garage area to check the damage. All the intake valves were bent, there were some broken springs and all the pistons were gouged. But the lower end bearings were perfectly sound and there was no other serious damage. Of course, it was a miracle that the engine hadn't scattered all over the track.

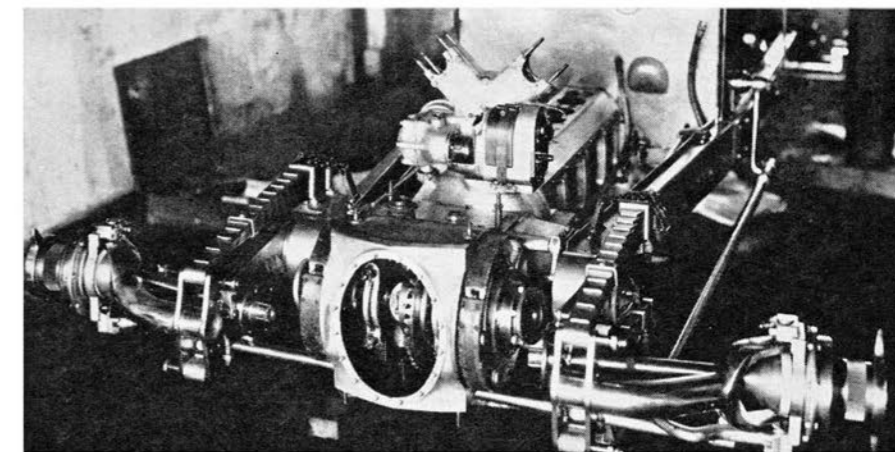
Again they tore down and rebuilt, working all night long and into the next day, when Frame finally qualified at 113.856 mph. It took 107 mph to get into the race and the Hartz-Miller landed in 27th place, on the outside of the ninth row. The car rode and handled like a dream and could be driven just about anywhere on the track.

Just before the cry of "Gentlemen, start your engines" Frame slipped Houck a package of chewing gum—Beemans Pepsin, it was.

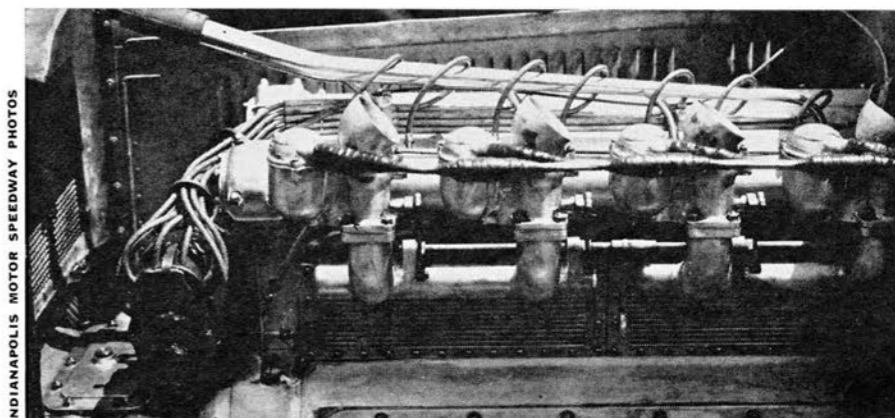
"I'll signal you for it when my mouth gets dry," he said.

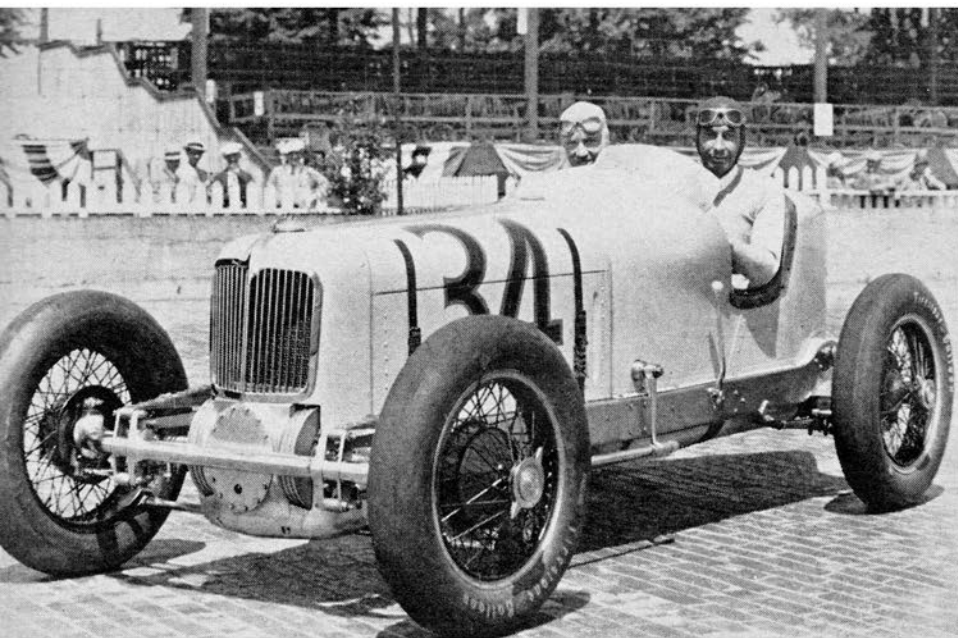
The car had it and from 27th, Frame methodically picked his way through traffic until, at the 100-mile mark, he was lying third. At that point the overflow tube fractured inside the radiator tank. The car lost water rapidly and Frame and Houck rolled into their pit in a cloud of steam. The tube was

GEARS FOR 2-speed transmission out of Detroit Special were between engine and final drive, permitted easy shifting and made for a very narrow unit.



NEW DOWNDRAFT carburetors were probably Miller's best units. Visible at extreme left is radiator overflow tube which broke off inside header tank.





COMPACT 2-MAN car emerged from Hartz-Miller merger. Front-drive unit from Detroit Special was used, with a new blank cover plate.



HARRY HARTZ as a driver in '27, before he turned his talents to building cars.

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pinched together below the header, more water was taken on, and the gasket that sealed the big Detroit Special filler cap was removed to relieve the system of pressure.

At the first blast into the south turn a geyser of water shot from around the cap. There was a smaller geyser when they accelerated into the back straight, because of reduced velocity, but going into the short north chute there was Old Faithful again. Frame backed off more and more and had dropped to sixth place at 150 miles. In the next 50 he had to make two more stops to take on water and, geysering four times per lap, dropped to tenth. On the fourth stop Houck, who had been pondering the problem, slapped a piece of rag under the cap—not enough to seal the pressure but, he hoped, enough to restrict the bursts of scalding water. This helped to the extent that at 250 miles, Frame had fought his way back to seventh position, but plenty of water still was being lost and the situation held little promise. Frame's heroic struggles and the obvious speed of his car when luck was with it were beginning to grip the crowd.

And then Houck remembered the chewing gum with a start. Frame had been too involved in his problems to be aware of the dry mouth which he no doubt had. Houck thought, "If I chew up all five of those sticks and roll the wad into a string and lay it in the gasket channel it might just seal off the water

but still act as a pressure-relief valve."

Houck began chewing, stick after stick. Frame threw him a wondering look and he nodded toward the radiator cap and pointed at it. Frame got the message, grinned, and took an even more purposeful grip on the wheel. At about 275 miles, they pitted again and the mechanic leaped out to apply his mastic and put in another load of coolant. It was the last that was needed. By 300 miles Frame had hacked his way up to second place as the Beemans held. At 400 miles he took over the lead.

And at just that point a new crisis arose. Just as Frame lifted his foot going into the south turn the transmission popped out of gear unnoticed. When he got back on the throttle nothing happened. He had entered the turn at a speed that demanded power to the driving wheels to pull the car through in a controlled line and a lesser driver might have panicked. Frame did not. He horsed the car safely around the bend, threw the shift lever back into top gear and motioned to Houck to hold it there.

They ran the last 100 miles that way, Houck leaning on the lever and both of them praying that the chewing gum would hold. It did and that's how the Hartz-Miller 183 won the big race its first time out. The record average for the 500 miles was de Paolo's 101.130 mph, which had stood since 1925. Frame's average was 104.44 which, in

spite of almost 15 minutes in the pits, he managed by lapping regularly between 117 and 118 mph. Not bad for 183 cubic inches, unblown, on gasoline.

"We ran pretty much flat out," Houck recalls, "never dropping below 5800 and hitting 6800 on the straights. If we were ever challenged at all it was by some of the 270-cu. in. straight-eights that had 50-75 horsepower over us. But they were rear drives. Only Billy Arnold could stick with us in the turns and he didn't have our output. It was fantastic the way Fred could pitch that car into the turns. It never boggled a bit. Even late in the race, when the turns were getting slick, he never had to yield because of the condition of the track. The rear end never wanted to kick out as the rear drives tended to do. It was a ride on rails and it gave me the greatest feeling of security I've ever had in a race car."

The next year, 1933, Frame and Houck qualified the Hartz-Miller 183 at 117.864 mph, led the race from 100 to 125 miles and then dropped out on the 84th lap with a broken valve.

In 1934 the team changed to veteran driver Peter Kreis and Art Hahn, mechanic. For no known cause they crashed in practice. The car sailed over the outside wall at the southwest turn, wrapped itself around a tree and broke in half. Kreis and Hahn were killed instantly.

For 1935 the car was rebuilt. Its 100-in. wheelbase was stretched to 101 and someone had the idea of fitting it with four updraft Winfield carburetors. Frame qualified it at 114.701 and finished eleventh, with an average of 100.436 mph. In that race he was unable

to push the rebuilt car better than tenth.

In '36 Hartz put Ted Horn in the driver's seat. Horn had won the pole position the year before in his first 500 and was one of the top talents of the moment. He qualified the well-used car at 116.564 mph. There was a limit of just 37.5 gal. of fuel for the race (it had been 42.5 in '35 and 45 in '34) and this restriction played cruel tricks on many of the most brilliant drivers. But the strategy of Hartz and Horn was planned and executed to perfection and it included not trying to win the race. Horn started in 12th position, marched systematically up to third at the 80th lap and then to second at 100 laps. And there he stayed until the checkered flag fell.

The car was rebuilt for 1937 and its wheelbase was lengthened 3 in. A centrifugal supercharger was added, the only room for it being behind the fire-wall, in the cockpit. Horn was the driver again, this time qualifying at 118.220 and finishing third with a 112.079 average, still nicely up in the money.

In 1938 Indianapolis returned to the international formula and the Hartz-Miller was rebuilt as a single-seater,

still blown. Horn qualified the old charger at 121.327 mph and finished fourth with an average of 112.203, still running in last year's groove.

In '39 Horn moved up to a very fast Maserati and Herb Ardinger qualified the Hartz-Miller at 124.125, a blazing speed for the veteran car. He went out on the 141st lap with what was termed "clutch or rear axle trouble."

In 1940 Mel Hansen was the driver and he qualified at an even faster 124.753 mph. He finished a respectable eighth overall. And then Hartz sold the car. It made a few undistinguished post-war appearances and then faded into oblivion.

But it lived on in other ways. In August of 1934 Earl Gilmore was dissatisfied with the motorcycle and out-board engines that were powering the midgets at his newly opened Gilmore Stadium in Los Angeles. He went to Fred Offenhauser—who had taken over the old Miller operation—and underwrote the design and development of a small thoroughbred racing engine.

It's an oversimplification to say that the smallest Offenhauser was merely a "cut-in-half version of the Hartz-

Miller." But it was very close. Goossen copied its combustion chamber design and used the same valve sizes and included angle. He used the same length and 0.25-in. offset for the connecting rods and the same stroke, enlarging the bore by just a few thousandths of an inch. There were important changes in crankcase, pumps and gear train but, from the bottom of the block to the cam covers the Hartz-Miller lived on as the Offenhauser Midget. And the ideas contained in the front-drive unit of the Detroit Special were reflected in all the front drives that followed it, including the winning Blue Crowns and the ever-trying Novis.

Perhaps the caper to the story is that Karl Kizer of Indianapolis, one of the real pioneers of the sport, for years had been trying to sell the idea of a racing museum at the Speedway. It was when he found, bought and restored the Hartz-Miller in 1954 that Speedway owner Tony Hulman became convinced and gave the project his blessing. The Hartz-Miller was the first acquisition, the nucleus of what is now one of the greatest automotive collections on earth. ■

**SECTIONAL VIEWS of Offenhauser midget engine reveal its similarity to the Hartz-Miller racing engine, although it wasn't the "cut-in-half" version that some people thought it was.**

