Wisconsin Society of Automotive Historians

Carhart Chronicle

Fall 2021

HARRY MILLER AND THE GOLDEN AGE OF THE RACE CAR; THE PRESIDENT'S MESSAGE; AND MEETING AT HARTFORD!!

MEETING OCTOBER 30TH – AT 2 P.M. AT THE WISCONSIN AUTOMOTIVE MUSEUM IN HARTFORD, WISCONSIN

The Museum is located at 147 Rural Street in Hartford. Please inform the admissions desk that you are there for the WSAH meeting and you will be admitted without charge. The meeting will be held in one of the conference rooms and the museum staff can direct you to its location. Please see the President's message for further details.

HARRY MILLER AND THE "GOLDEN AGE OF THE AMERICAN RACE CAR"

1924 Miller 122

Every year in July, they gather at the Milwaukee Mile. Miller race cars, in motion – doing what they were designed to do: go fast. But when you observe them in the pits, you'll find yourself surprised by their mechanical beauty. These are race cars engineered without compromise, with even the unseen finished to perfection, designed to win.

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WORDS FROM THE PRESIDENT

Before I write a single word about anything else, these words from the September 1, 2021 issue of Old Cars magazine have priority. In the "Club Clips" column, author Gerald Perschbacher highlighted "four top-notch club pub[lication]s...[including] Carhart Chronicle (Wisconsin Society of Automotive Historians, auto history.org)." Perschbacher writes, "What added zing to Carhart Chronicle's recent issue was an outstanding five-page feature on William C. (Bill) Harrah and his car collecting days. A legend in his time, Harrah's notability continues among car collectors, including his friendship with other great collectors such as Jack Nethercutt. Editor Ralph Kalal takes the bow for the superb article idea." (Well deserved accolades, Ralph!)

I always look forward to our meetings at the Wisconsin Automotive Museum in Hartford. We typically have our best turnout, which helps to get direct input from members. The museum opens at 10 a.m., so you can arrive early and check the vehicle collections, featuring Kissels of course, as well as automobilia of all sorts.

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WORDS FROM THE PRESIDENT CONT.

Remember to tell the person at the entry window that you are with WSAH to be admitted at no charge. You are welcome to bring a guest, especially one who might be interested in joining our organization. Our meeting is at 2 p.m. in a private room and several members go together to a nearby eating establishment after adjournment.

I would like to have all of you, whether or not you will be at the meeting, express your thoughts on forming committees to better focus on such areas as recruiting members, arranging different meeting sites and activities between meetings such as vehicle collections or museums, maybe a committee to help with organizing our portion of the Iola Car Show, and anything else that needs attention. I realize time...priorities, really...is an obstacle to overcome and I'm certainly not the only one whose time, along with energy, and money are often spent. (I recently heard that what a person contributes to an organization can be categorized as Time, Talent, and/or Treasure. If someone wants to be involved, they likely have one or more of these.) It's possible that many members are content to have WSAH be a social group (Society?) and that is why it is so difficult to get more than a few involved.

With the mention of committees, especially the always important recruitment, I'll again reference Old Cars magazine, this time the September 15, 2021 issue and the Ken Gross column, "Speaking of Hot Rods" with the title, "Hot Rodding's Future: 'We'll Adapt'." Gross takes on the long-time concern of so many clubs: How to attract younger members. He is a "1941Guy" so has the perspective of a person who has 80 years of accumulated knowledge on this planet. While he is likely best known for writing about hot rods, he has many automotive interests, and has been a member of the Classic Car Club of America since 1964. He notes that in the club's recent editorial it states their average member's age is over 65. Without detailing the three-page article, which we can certainly discuss at our meeting, Gross's optimistic assessment of the future of the car hobby can be summed up with his quote from well-known hot rod builder Roy Brizio, "People will always want to express themselves on wheels. That won't change - ever." Hopefully that is true of automobiles in general and automotive history in particular.

Recently, VP Don Gullikson and I met with Iola Car Show staff to discuss this year's and next year's shows. We can outline this at our meeting, but here I would like to comment about WSAH's involvement. A few members, past and present, whose input I greatly respect, have mentioned that it seems our main focus is the Iola Car Show and not automotive history. I agree. Our treasury would be in sad shape without the show, and those members who are involved seem to enjoy it and look forward to it as a social gathering. I have volunteered hundreds, maybe thousands, of hours to it in 31 years, so obviously I like it. However, I believe Iola should not be our only priority even if it is one of mine, along with keeping WSAH a viable organization. Of course, WSAH is not my personal organization, so when this self-proclaimed PfL - President for Life - leaves this orb to explore the unknown (hopefully at least a couple decades from now), others will make it their priority and carry on.

Ken Nimocks

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WISCONSIN-AUTO-HISTORIANS.ORG

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MINUTES OF THE JULY 10TH MEETING

The Wisconsin Society of Automotive Historians met in a section of the now remodeled Iola Car Show Special Exhibit building. This is our second meeting of the new year after meeting in Green Bay at the Auto Gallery to plan duties and concerns for the Iola Car Show. Our meeting began promptly at 11:00 a.m. Those members or guests attending the meeting were President Ken Nimocks, Vice President Don Gullikson, Treasurer Gary Koehnke, Secretary Dan Manola, Carhart Chronicle Editor/ Publisher Ralph Kalal, and members Dan Sharpee, David Tesch, Randy Nimocks, and Terry Nimocks. Member Greg Vanark and son Kegan, and Trish Nimocks volunteered to handle the WSAH information and sales table in the Special Exhibit building during the meeting. President Ken Nimocks next read the minutes of the Spring meeting held in Green Bay. Gary Koehnke next gave the Treasurer's report and summarized income and expenditures. He explained that even without our usual Iola Car Show payment given to us for assistance at the show, our treasury was still in sound financial condition. A motion was made by Randy Nimocks to accept the Treasurer's report and seconded by Don Gullikson.

Old Business - Conversation gravitated to maintenance of our website. It was felt we should still add more links on the site which would steer visitors to such topics such as The Museum of Speed, Wisconsin produced vehicles, as well as the story of the Pug, and other not so well known vehicle Wisconsin start ups. It was felt that newspapers were a huge early source of information on some auto makers. Presently Webmaster Jessica Zdanowicz has brought the site up to date with postings of the Carhart Chronicles as well as past Spark named newsletters.

Attention was also paid to updating our WSAH brochure. An easier joining format and possible dues payment method was discussed. The dues for our national Society of Automotive Historians are $25, which gives a member the ability to receive all the publications online rather than mailed printed materials. The dues are $50 for the printed versions.

It was felt that we should continue in distributing to potential members a copy of The Carhart Chronicle to bring in new members. Also, our updated brochures could be available to a potential member at the Wisconsin Auto Museum as well as The Automobile Gallery in Green Bay.
Iola Car Show- In organizing the show displays with Show Car Director Denise Clumpner, members roped off and set the needed areas with the various cars in the mapped out positions. The Lindsay Room, as well as the Theme Exhibit area in front, were completed on Wednesday July 7th. The disconnected batteries as well as capped fuel inlets was completed per fire department recommendations. The meeting was adjourned at 1:00 p.m. with members returning to the WSAH table and show. Our Fall meeting will be announced in the Carhart Chronicle and group email with date and time.

Respectfully submitted,

Dan Manola, Secretary

OCTOBER MEETING AGENDA

Introductions

Treasurer and Secretary Reports

Donations – Motions and Approval

Discussion on recruiting members and increasing public awareness of WSAH

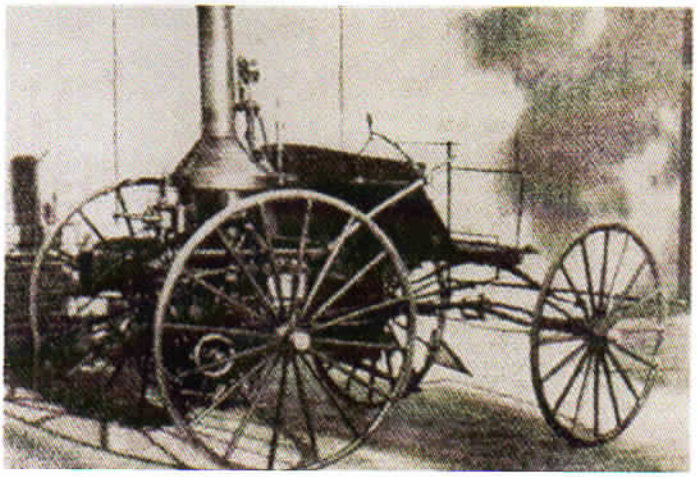
Discussion on forming committees to accomplish our purposes

Iola Car Show '21 and planning for '22

Next meeting and ideas for membership gatherings

Member input on other items for discussion

THE REV. DR. JOHN WESLEY CARHART



THE CARHART CHRONICLE IS NAMED IN HONOR OF THE REV. DR. JOHN WESLEY CARHART, CREATOR OF THE "SPARK" STEAM CARRIAGE (ABOVE) CONSIDERED THE FIRST TRUE AUTOMOBILE, AT RACINE, WISCONSIN, IN SEPTEMBER OF 1873.

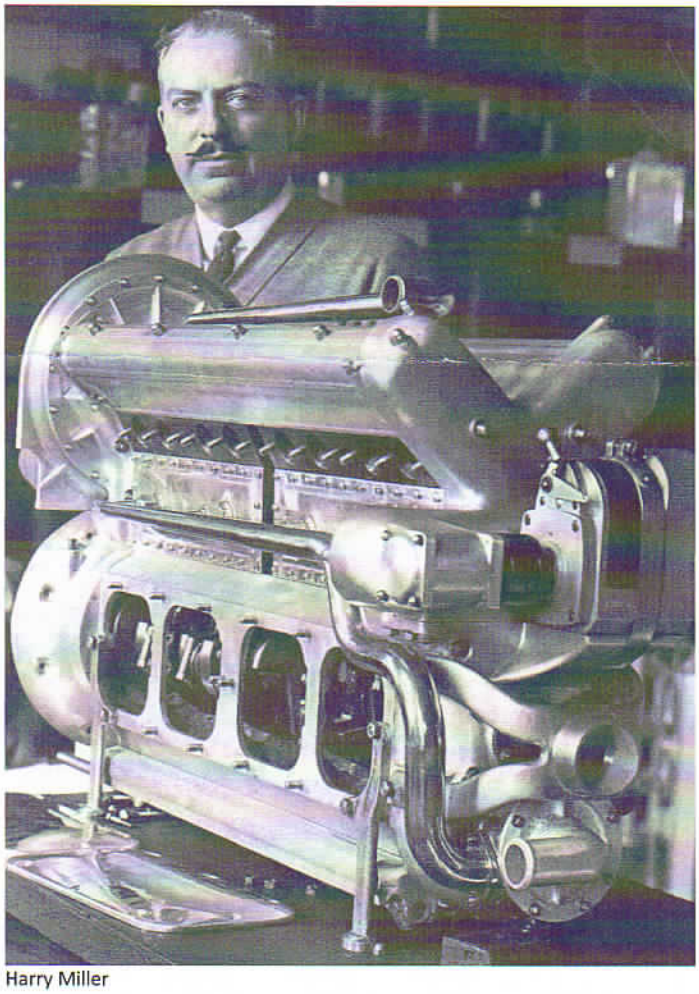
HARRY MILLER, CONT.

These are the cars that dominated automobile racing in the United States in what automotive historian Griffith Borgeson calls "the Golden age of the American Racing Car."

These are the cars that won the Indianapolis 500 twelve times.

These are the creations of Harold (Harry) Artemis Miller.

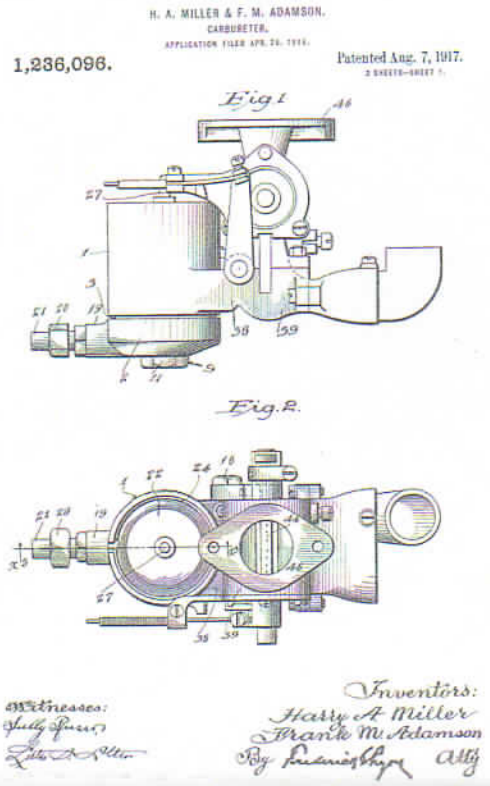
Born in Menominee, Wisconsin, on December 9, 1875, Harry Miller died on May 4, 1943. Though he had achieved success and fame in life, his death was little noticed – the passing of a man who had outlived his genius. Only with the retrospective clarity of history has that genius again come into focus.



Harry Miller

Miller quit school at age thirteen, leaving home at age seventeen. He arrived in Los Angeles, California, in 1895. He learned the skills of a machinist, working in machine shops, bicycle shops, and a foundry. His education was not from the classroom, but from his experience coupled with an innate ability to understand what he observed.

In 1907, Miller formed a company to manufacture a carburetor of his own design. This was the "Miller Master Automatic Carburetor." It was a design that used multiple jets progressively opened by a barrel shaped throttle valve


H. A. MILLER & F. M. ADAMSON.
CARBURETER.
APPLICATION FILED APR. 26, 1916.

1,236,096. Patented Aug. 7, 1917.

Fig 1

Fig. 2.

Witnesses:

Inventors:
Harry A Miller
Frank M Adamson
By Lemuel Shepherd Atty

Patent application for the Miller Master Carburetor

to provide more precise air/fuel ratios than conventional carburetors, especially at higher engine speeds. Though manufactured for many street vehicles, including the Ford Model T – production was 5,000 carburetors per month - the Miller Master Carburetor quickly became the carburetor of choice for automobile racing.

That success attracted an offer to purchase the production rights to the Master carburetor, which Miller accepted. Backed by the proceeds of the sale and royalties from its continued production, Miller now focused exclusively on racing.

The Harry A. Miller Manufacturing Co. had become a haven for the speed obsessed of the day. Miller had been the first to produce lightweight pistons, introduced in 1913 and manufactured from Alloyanum, an alloy of aluminum, nickel, and copper Miller had originally developed for carburetor bodies. He now introduced a new line of carburetors designed exclusively for racing. His company's expertise in metalwork and machining had attracted talent – in particular, Fred Offenhauser. Offenhauser, a master

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machinist, joined Miller in 1913 and was soon in charge of the company's shop and manufacturing operations. That talent, in turn, attracted a clientele at the pinnacle of automobile racing. They took their broken race cars to Miller to be repaired. Offenhauser gained a reputation as one who could fix anything and Miller and his staff soon were attracting repair work on all the racing marques of the time: Isotta, Fiat, Benz, Delage, Mercedes, Peugeot, and Duesenberg.

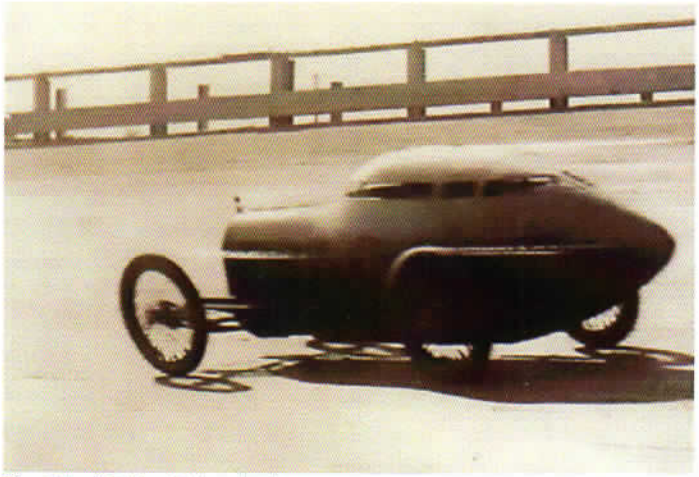
Then came the commission that would transform Miller from a manufacturer of parts and provider of service into the builder of racing engines and race cars that would ultimately dominate racing in the United States.

Known as the "King of Speed," Bob Burman had achieved fame racing a Peugeot. He'd also blown up the engine at the end of the season. Now, as a new racing season approached in the fall of 1914, Peugeot explained to him that they were no longer producing race engines and were focused on military production only – World War I was beginning.

Burman turned to Miller to produce a new engine - in four months. Miller delivered on time. Miller's engine, though based on the Peugeot design had improved on that design, and Burman's car was faster than before. Burman won two races the following season and orders from others for engines designed and manufactured by Miller followed. The first entire Miller race car was designed in 1916 around a 289 cubic inch four cylinder engine featuring a one-piece crankcase and cylinder block cast of aluminum with a 3.625 inch bore and 7.0 inch stroke, four valves per cylinder operated by a single overhead camshaft driven by spur gears, tubular connecting rods, detachable heads, and a barrel crankcase supporting a two-piece crankshaft through 360 degrees.

While that car was under construction, Barney Oldfield dropped by. Miller had rebuilt Oldfield's Delage, but it was no longer competitive. He decided to order a complete car from Miller.

The result, completed in 1917 at a cost to Oldfield of $15,000 (inflation adjusted, that's $322,000 – which also suggests how well it paid to be a successful race car in those days) became famous as the "Golden Submarine." It was revolutionary because it was a completely enclosed car with a teardrop body of aluminum over a light steel framework – what the Italians would later call "superleggera" and claim they invented – finished in gold lacquer. Its engine had a dry sump crankcase, cast iron block with integral heads, and desmodromic valves, which was a design Oldfield favored because the camshaft both opens and closes the valves mechanically. The cam has two lobes for each cylinder, one to open and the other to close the valve. Because the system uses no springs, this avoids valve bounce at high rpm. The engine produced 125 horsepower at 2,950 rpm – though Offenhauser later



The Miller "Golden Submarine"

admitted the engine was designed to produce peak horsepower at 4,000 rpm.

Fame followed Oldfield and the Golden Submarine wherever it went. Pitted in match races against Ralph DePalma and his Packard, Oldfield won all three held in Milwaukee and four of six held at other tracks. Oldfield then used the Golden Submarine to break every international dirt track record for distances of one to fifty miles.

This was merely prelude to the glory years that were to follow for Harry Miller.

In 1919, Miller produced the first Miller 183 engine, the number indicating cubic inch capacity. It was ordered by Tommy Milton to his own general specifications. At the time, Milton dominated American racing, winning five of nine championship races that year. He would be the first driver to win two Indianapolis 500 races. (In 1936, retired from racing and, now driving the pace car at the 500, he would suggest giving the pace car to the race winner and thereby inaugurate yet another Speedway tradition.)

The 183 was a straight-eight cast in two blocks of four cylinders, with four valves per cylinder, bore of 2.6875 inches and stroke of 4.0 inches, and designed to run on a mixture of gasoline and benzole with 7.8 or 8 to 1 compression ratios. It had integral (non-detachable) cylinder heads and dual overhead camshafts, again driven by spur gears and counterweighted to eliminate vibration. The carburetion was remarkable. Miller designed a new twin-throat carburetor that effectively was one carburetor

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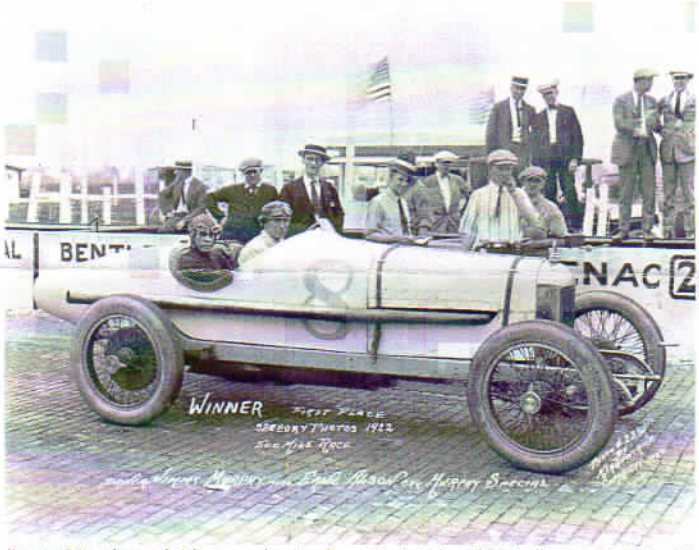
per cylinder – an arrangement that reportedly inspired creation of the famous Weber carburetor. Miller had also discovered ram tuning. With a separate pipe from the carburetor to each intake port, he recognized that the length of the intake pipe affected engine performance. He experimented with different lengths to achieve the optimum length and shape of the intake runners.

After initial cooling issues were resolved and changes were made to the camshaft design, Milton took the 183 to its first victory at the 250 mile race at Tacoma, Washington, in 1921. Following the race, Jimmy Murphy and Harry Hartz, ordered Miller 183 engines for their Duesenburg French Grand Prix cars.

Replacing the original Duesenburg engine with the Miller 183, Murphy dominated the 1922 Indianapolis 500. He qualified on the pole, led 155 of the 200 laps, and won the



Jimmy Murphy and riding mechanic after winning the 1922 Indianapolis 500 with the Miller-engine "Murphy Special"

race with an average speed of 94.48 mph that shattered the previous record of 89.84 mph. He finished over two laps of head of Hartz in second place, also driving a Duesenburg powered by a Miller 183. Murphy and his Miller-engine "Murphy Special" went on to win the AAA national championship. By the time he won the final race of the season at the board track in Beverly Hills, California, he was driving a car built by Miller.

This was the beginning of a decade in which Miller would dominate racing in the United States, the "golden era" to which Borgeson referred.

In 1922, Millers or Miller-engine cars won eight of nine major American races. In 1923, Miller cars won all nine major American races. In 1924, it was seven of nine. 1925, four of ten. In 1926, seventeen of twenty-two. 1927 saw Millers win seven of the nine major American races held that year. In 1928, Millers won five of six. And in 1929, Millers won all twelve major American races held that year.

Millers lined up at the starting line on a board track, probably in California

A new engine displacement formula was imposed for 1923 by the AAA, which was then sanctioning organization for major race events in the United States, effective after the Indianapolis 500 at the end of May. The Miller 183 continued to win races to that point, and Miller then introduced a 122 cubic inch engine that met the new rules and continued Miller's winning streak. Design of the Miller 122 was similar to that of the 183. It was again a straight eight, but it differed by employing hemispherical

1924 Miller 122

combustion chambers. It also introduced a unique design feature – driving the magneto from a power takeoff at a right angle to the main gear tower (the Y shaped series of gears transmitting rotation from the crankshaft to the camshafts). Battery ignition had been rejected by Miller for both the 183 and 122 because it added weight and batteries could not stand up to the vibration created by racing speeds on rough tracks, including the brick surface at the Indianapolis Motor Speedway.

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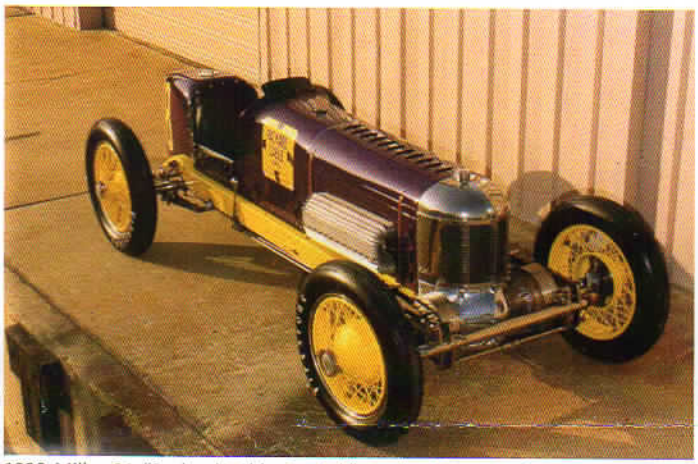
Throughout the period, Duesenburg had been a rival to Miller, but the Miller 183 and 122 engines had put it at a disadvantage. Fred Duesenburg responded with supercharged engines for the 1924 Indianapolis 500 – one of the two races won by a Duesenburg that year. Now it was Miller's turn to play catch-up. Miller did produce supercharged versions of the 122, but only a few. The 122 was to be a transitional engine, as a new 91 cubic inch displacement limit was to be imposed for the 1926 season, again a futile effort to limit racing speeds.

In response, Miller produced the classic race car of the pre-War era, the Miller 91, the number again representing cubic inch displacement.



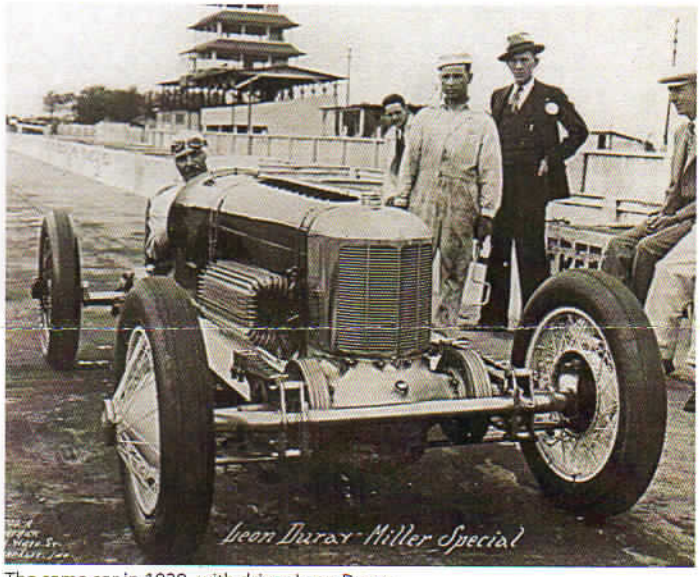
1929 Miller 91 "Packard Cable Special," at the Museum of American History, Washington, D.C.

Work on the new engine began following the 1925 Indianapolis 500, which had again been won by a Duesenburg. The Miller 91 engine was designed from the outset as supercharged, with the supercharger powered by spur gears driven from the crankshaft. Tolerances in the engine were extreme and precise – for example, clearance between the crankshaft counterweights and the crankcase wall was 0.03 inch. The Miller 91 could exceed 8,000 rpm without issue.

By this time, race cars no longer had riding mechanics – the AAA had made them optional in 1923 – and Miller had taken full advantage of the rule change to make the Miller 122 race cars as narrow and aerodynamically efficient as possible. With the 91, he went even further.

In 1924, Jimmy Murphy had become convinced that a front wheel drive race car would be unbeatable. That may seem an odd theory today, where the understeer of front drive cars is thought incompatible with sporting handling. But racing in the 1920's was on rough racetracks that often became oily as the race progressed. Tires were narrow, with tiny patches of tread in contact with the track surface. Front drive offered better traction – and it also offered a lower vehicle, with a lower center of gravity and less frontal area to create aerodynamic drag. Murphy took his concept to Miller, where Miller and another of his key employees, Leo Gossen, worked to turn the concept into a race car.

Though the standard Miller 91 was a rear drive car, as had been its predecessors, the front drive version of the Miller 91 was even more advanced. The transmission was of Miller's own design, transversely mounted short enough to fit the seventeen inch distance between the frame rails. It was fragile, but intended for speedway racing where the only gear shifts were those required to get up to racing speed. The front suspension was a De Dion design (where the axle half shafts act in concert with a bar that bears the weight of the vehicle, so that the wheel camber is unchanged through suspension travel), the first use of this design in racing. Front brakes were inboard.



The same car in 1929, with driver Leon Duray

The Miller "Packard Cable Special" pictured on this page – as it is today at the Museum of American History of the Smithsonian Institution and as it was in 1929 - is one of only two Miller 91's to survive in unmodified condition. Its usual driver was Leon Duray, though Ralph Hepburn drove it in the 1929 Indianapolis 500. Duray then used the car to set a closed course speed record of 148.170 mph. Afterward, he took the car to Europe, racing it at Monza in Italy. Though it did not finish the race, it did get noticed – by Ettore Bugatti, who promptly bought this Miller and another from Duray. That is why the Bugatti Type 50 engine looks as though Miller designed it.

Both Millers survived the war intact and were discovered at Bugatti's facility in Molsheim, France, in 1953 by Griffith Borgeson, then editor of Car & Driver magazine. Borgeson purchased both, restoring this car and selling the other to

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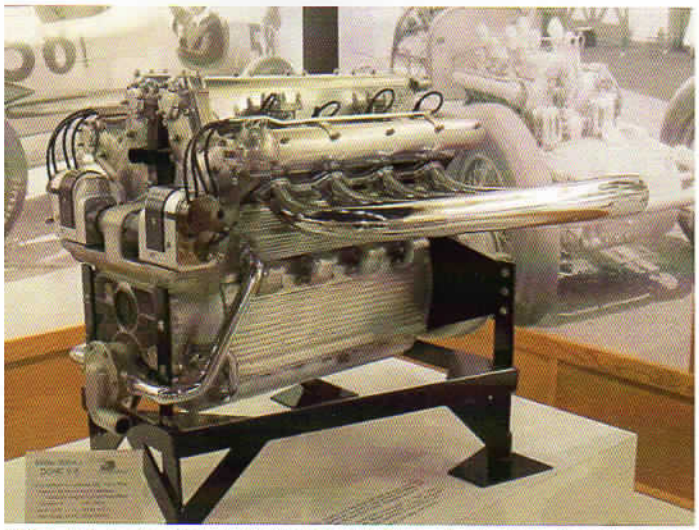
the Indianapolis Motor Speedway Museum. This car was ultimately sold by Borgeson to William Harrah. After Harrah's death, it was purchased by financier Robert Rubin, who donated it to the Museum. And that is the unlikely story of how Ettore Bugatti preserved the only two unmodified front wheel drive 91's still in existence.

Leon Duray used a different front drive Miller 91 to set a lap record during Indianapolis 500 qualifying in 1928: 124.018 mph – a lap record that remained unbroken for nine years. A Miller driven by Louis Meyer won the race and Millers accounted for 22 of the top 25 finishing positions.

Miller would again win the 500 In 1929, but the "golden era" was ending, with new rules announced for the next racing season by the AAA Contest Board that banned supercharging, again required riding mechanics, and were designed to favor racing with engines based those used in production passenger cars.

Maybe Miller saw the proverbial writing on the wall, because in 1929 he sold his business for $150,000. Add to that the $60,000 retainer received from E. L. Cord to work on developing front wheel drive for passenger cars and Miller could have lived out his days in comfort and luxury. He'd sold out just before the stock market crashed in October.

But he couldn't stay away.



Miller V-8 at the Speedway Motors Museum of American Speed, Lincoln, Nebraska

He joined with executives of several major aircraft manufacturers and formed the Miller-Schofield Company to manufacture aircraft engines and performance parts for the Ford Model A. The venture failed, with corporate bankruptcy in 1930. On his own, Miller then turned back to what he knew best – building race engines and race cars.

He designed a four wheel drive race car powered by a twin-cam V-8, of which four were produced. It cost $30,000 depression dollars to build them, and they were failures. There was neither the time nor the money to sort the flaws and perfect the designs.

Miller was forced into involuntary bankruptcy in 1933.

He would go on to other projects, including a Miller-Ford race car for Indianapolis in 1935 500 that was advanced in design, but rushed in execution. Lacking the patience needed to perfect the design, Henry Ford cut off funding. In 1937, he began a project for a new Indianapolis race car, which eventually attracted corporate support from Gulf Oil. Miller designed a new car with a mid-engine supercharged six cylinder of 180 cubic inches – the first "oversquare engine (bore wider than stroke length). It had four wheel drive, disc brakes, and independent suspension. It did not qualify for the 1938 Indianapolis 500 and the three new versions built for the 1939 race failed to finish the race. Gulf dropped their support for the program.

Even so, Miller's designs continued to dominate racing in the United States for the next two decades.

Some of the assets of his company had been purchased at the bankruptcy auction by Fred Offenhauser. Miller had designed a four cylinder marine engine of 151 cubic inch capacity, based on the same design as the 183 and 122 cubic inch engines. In the early 1930's, Miller had been asked to turn that marine design into an economical racing engine. The result was a 220 cubic inch four cylinder. Miller's interest in a four was minimal – his interests lay with developing new concepts, not producing old ones. He made little effort to market it, so tooling and rights to the 220 four became an asset of the bankrupt business, assets that Offenhauser – who had been primarily responsible for refining the marine design into a race engine – purchased.

These became the Offenhauser engines that would win the Indianapolis 500 twenty-five times, the last Indianapolis win coming in 1976.

You should go when the Harry Miller Club gathers next year at the Milwaukee Mile on is July 8th and 9th to bring Miller race cars to life. Millers at Milwaukee is open to the public. You'll watch from the pits as these legends speed by, the legacy of a man who, driven by genius and vision, conquered American racing.

Millers at the Milwaukee Mile