MOTOR TRANSPORT MUSEUM NEWS

Volume X No. 1 31949 Highway 94, Campo, CA 91906 Spring 2008

The MTM volunteers spent the winter working on housekeeping chores and the restoration of the 1924 Cadillac stage. The body was mated to the chassis this February. Some mechanical work on the doors yet to be done and body electrical work, upholstery and painting is still ahead

Clessie Cummins and his Amazing Engine by John W. Thomas

Although he didn't invent the diesel engine, Clessie Cummins is the name recognized worldwide as the man who made it the automotive power plant that it is today. He was a fascinating combination of daredevil, entrepreneur, mechanic and salesman who filled all the niches necessary to survive the cutthroat industrial environment of the early 20th century.

Childhood in Indiana

Clessie Cummims was born in 1888 in a small town in southern Indiana. His parents were descendents of pioneers who had farmed that area since the 1830s. His father was the proprietor of a barrel hoop mill that required that the family move often to find fresh groves of suitable wood for his product, thus Clessie's schooling was somewhat chaotic. He finally dropped out of the eighth grade in Columbus, Indiana at age sixteen and that was the extent of his formal education. He received a diploma two years later, reportedly the result of negotiations of his determined mother

He had spent his spare time during his childhood and adolescence learning all he could about pyrotechnics, mechanics and electricity from anyone who would take the time to teach him, though he often approached his projects with more enthusiasm than good sense.

After leaving school Clessie busied himself working in the thriving industrial companies in Columbus and Indianapolis, forty miles north. He held a number of short-term jobs from apprentice machinist to automobile test driver to inspector.

In 1908 he went to work as a chauffeur for Columbus banker W. G. Irwin, beginning the most influential business relationship of his life. Mr. Irwin was the richest man in Columbus, and Clessie, as driver and mechanic for the 1907 Packard, was in daily contact with all members of W. G. Irwin's extended family. The job was only part time, however. The Packard spent winters on blocks in the garage and the Irwin family spent summers at their vacation house in Canada. This left Clessie with considerable spare time to pursue other interests. He raced a Pennsylvania Rail Road train in an inter-urban electric car on a line owned by the Irwins (he had been hired as a motorman during the off season) and won. He converted the Packard to a railcar by mounting steel flanged wheels and took inter-urban company officials on a high speed, multi-county tour of the system routes. He and his brother-in-law took a winter cruise from Indiana to New Orleans on the Ohio-Mississippi river system in a homemade 18-foot inboard motorboat. He worked on the pit crew for the Marmon "Wasp" racecar during the first Indianapolis 500 auto race.

The Cummins Machine Works

But Clessie's first love was machinery, especially engines. He convinced Mr. Irwin to bankroll an auto repair shop in an Irwin-owned building in Columbus. The Cummins Machine Works maintained most of the automobiles in the county and provided contract machine work to other businesses in and around Columbus. The enterprise prospered, Clessie had four men working for him and the Irwin family came home from their 1917 summer vacation to find the garage behind their mansion filled with machines machining artillery wheel hubs for the army. This was World War I overflow work from Clessie's shop downtown. Not only were their cars garaged elsewhere but the noise and commotion behind their house went on 24 hours a day.

It was quickly decided by all concerned that the Cummins Machine Works needed more space, and in 1918 the Works rented an abandoned mill in Columbus. By then, Clessie's war work had diminished and he had time to pursue his interest in engines. From the start his interest was confined to diesel engines burning kerosene as a fuel.

The Cummins Engine Company

The invention of the compression-ignition internal combustion engine is attributed to Rudolf Diesel and hence the name "Diesel engine". The diesel engines of the 1918 era were large, slow-speed, high horsepower affairs used for ships, submarines and large stationery power plants. The fuel was introduced into the combustion chamber by a blast of high-pressure air. The cost and complexity of this system made it impractical for the smaller engines that piqued Clessie's interest. Devising the optimum small-engine fuel injection system would provide a lifetime project for the young inventor.

Clessie was interested in a diesel engine design by Rasmus M. Hvid, a Danish engineer who was selling licenses to make small single cylinder engines used on farms and in factories. He wanted to buy a license but didn't have enough money. W. G. Irwin agreed to help him set up a company to buy the license and start manufacturing the Hvid engine. The Cummins Engine Company was incorporated in 1919 with Clessie L. Cummins as president and funded by the sale of 500shares of stock at $100 per share. Mr. Irwin bought 100 shares, Clessie was awarded 200 shares for his contribution of the Machine Works tools and the rest was sold to the citizens of Columbus. The next 10 years would be an odyssey of triumphs and disasters.

Sears Roebuck and the Hvid Engine

Clessie's original idea was to manufacture Hvid engines for sale under the Cummins name but Sears Roebuck was looking for a supplier to manufacture engines for its mail-order business. It had contracted with Hercules Engine Co. and orders had outrun Hercules' manufacturing capacity. Cummins took on a contract to supply the same 6 brake horsepower (bhp) engines as Hercules as well as engines scaled to $1^1/_2$ and 3 bhp. Unfortunately the engine fuel injector design didn't scale well and Clessie found himself falling behind in his deliveries while trying to find design fixes to the unproven engines. Hvid in Chicago sent Hans L. Knudsen, a designer and trouble-shooter for Hvid to Columbus and he and Clessie designed, tinkered and tested frantically trying to find injector fixes as delivery delinquencies grew. By 1922 Sears and Cummins started contract cancellation procedures and by November 1923 all ties were severed.

Meanwhile, Clessie had been developing a vertical cylinder engine of the Hvid type for marine use and personally went to bayou country of Louisiana to sell it to shrimp boat operators. It was a long hard sell. He finally got one installed in a shrimp boat and its economical use of fuel impressed the shrimpers. However, a series of mechanical failures ended this endeavor with the six or seven sold returned to the factory for refunds. The Hvid concept had run its course and engine building operations were at a virtual standstill. Clessie had a slew of fuel injector patents and a lot of hard-won experience to show for the Hvid enterprise but little else.

W. G. Irwin who had sunk several hundred thousand dollars into the Hvid project was still supportive of Clessie's ideas. He and Clessie incorporated a new company, the Oil Engine Development Company, (OEDC) to hold any future patents to keep them from reverting to Hvid and continued Clessie's injector experiments. Contract machining sustained the engine company during the dry spell

Finally in 1924 The Engine Company had a marketable engine, the model F that was available in 1, 2, 3, 4 and 6 cylinder configurations with $12^1/_2$ bhp per cylinder. Clessie went to the Gulf coast to try to repeat his short-lived success with the Hvid engine, but the shrimpers remembered his earlier fiasco and he only made one sale. He then went to the Pacific Northwest where he sold 45 engines to the fishermen of Puget Sound. The engine also gained favor as a power plant for small electric generating units. W. G. Irwin and Clessie reorganized and re-capitalized the tattered Engine Company in anticipation of booming orders.

Although the Engine Company had its greatest success in the marine and electric generation fields, Clessie was always looking for new applications for his engine. A batch of 50 was sold to a Wisconsin equipment contractor to power excavating shovels but a combination of dirt and overloading doomed them to failure. A preliminary design of a diesel-powered rail car was developed with J. G. Brill Company of Philadelphia and a diesel engine was developed for a diesel electric railroad engine with the Pennsylvania Railroad. But the stock market crash of October 1929 ended these endeavors and threw a scare into the long-suffering W. G. Irwin. On December 13 he informed Clessie that he would be closing the company and turning to other things.

Clessie's Road Show

Clessie responded in typical Clessie fashion. The next day he and the company chief engineer, H. L Knudsen, (who had been hired away from Hvid) went to Indianapolis, bought a 1925 Packard limousine and took it back to Columbus. Clessie found a little-used corner of the factory where he, H. L. and a small band of workmen could secretly install one of the company's diesels in place of the gasoline engine. They finished on Christmas Eve. On Christmas morning, after a short test drive with his son, he took the car to show Mr. Irwin. It was several miles into the drive around the snowy Columbus streets with the Cummins family and Irwin family in the back seat before Clessie revealed that the Packard engine had been replaced by a Cummins diesel. Mr. Irwin's enthusiasm came back in a rush and the Engine Company was saved.

Clessie and the Packard then began a round of publicity appearances with him always in the driver's

seat. He drove the car to New York (about 800 miles) to the National Automobile Show and, on the way back, to the National Road Show in Atlantic City, NJ and the Society of Automotive Engineers' annual meeting Detroit. He also showed the car to Walter P. Chrysler and Henry Ford and was invited to run it on General Motor's dynamometer.

Later in the spring he modified a Packard roadster with a Cummins diesel, took it to Daytona, FL and set a diesel automobile speed record of 80.389 MPH on the sands of Daytona Beach. The future of the automotive diesel seemed assured.

The automotive business of the 1930s was a cutthroat affair and Clessie was leery of wading into it with his low volume, hand crafted engines. He explored a number of offers to buy the company, Studebaker, Hercules and General Motors as well as others were interested, but Mr. Irwin would have none of it. Knowing that producing engines for the high volume automobile market was out of the question, Cummins Engine Company concentrated on the much lower volume truck market.

The factory was at a low level of output and the engineering department was busy designing a truck engine when Clessie set off again looking for more publicity. He turned again to Daytona with a Duesenburg racecar fitted with his diesel and set another diesel speed record of 100.755 mph. He then entered the car in the 1931 Indianapolis 500 race, hiring race driver Dave Evans to drive the Duesenberg. The car finished 13th (out of sixteen that finished) without any pit stops. It had enough fuel to return to Columbus without refueling.

Although Clessie had not expected to win Indy he had expected to do better than he had. But the publicity was tremendous and he had met many influential people who would be lifelong friends.

Coast to Coast with no Brakes

Clessie's next stunt was to fit a diesel into a truck and try to set a transcontinental record. As cargo he would transport the Duesenberg to the West Coast for more publicity runs. The factory fitted an Indiana Truck Corp vehicle with a Cummins engine and, with Dave Evans and Ford Moyer, a dirt track driver Clessie set off.

The shakedown leg to New York for the start of the run was not without incident, as they found that the brake system was not adequate for the overloaded truck. They tried to fix it but to no avail and started the run to Los Angeles at 10:00 pm on August 10, 1931. After a seventeen-hour water pump repair in St. Louis and a terrifying trip down California's Cajon Pass with no brakes they finally pulled into Los Angeles in 125 hours 52 minutes elapsed time and 97 hours 20 minutes running time, both new records. Fuel (at 5 ½ cents per gallon) cost $11.22 for the 3,214 miles.

The 1930s were years of increased recognition for Clessie and slowly increasing fortunes for the Cummins Engine Company. Orders increased, the facilities were expanded and in 1937 the company turned a profit, its first annual one since its incorporation. Clessie was still fully involved with the development of new ideas for fuel injectors and patents were being written and approved and assigned to the Development Company. Joseph Irwin Miller, W.G. Irwin's grandnephew, was appointed General Manager of the Engine Company and made great strides in turning the shop into a modern production plant. The diesel truck business was brisk as truckers realized that they could quickly recoup the extra cost of the diesel engine from the much lower fuel costs. Although selling engines to truck builders who also made engines was a risky way to do business, Cummins was quite successful.

During the years of World War II Clessie spent a year and a half on the War Production Board allocating industrial materials. On December 14, 1943 W. G. Irwin died of a heart attack.

After the War Clessie, in declining health, retired to California. He remained president but the running of the company was left in the capable hands of J. I. Miller, with Clessie making visits to Columbus several times a year. In 1947 he resigned as president but was elected to the chairmanship of the Board. J. I. Miller succeeded him as president, confirming the arrangement, which had already been established in fact.

Clessie Retires

Although retired, Clessie was not idle. He had a machine shop in his garage at his Palo Alto home and bought and refurbished several Rolls Royce automobiles. He also bought a boat, re-engined it with a Cummins diesel and went cruising on San Francisco Bay. In addition to his Board Chairmanship, he kept working with the Engine Company to perfect new fuel injection ideas, and this was the work that would strain his association with the Company and sour his relationship with its managers.

Throughout Clessie's association with W. G. Irwin and the Irwin family Clessie had been principally a paid employee. Although he acknowledged and appreciated Mr. Irwin's constant financial support, making one loan after another when the Company seemed like a bottomless pit, he felt

that W. G. didn't give the hard work and mechanical insight that Clessie provided enough credit for the company's eventual success. In 1955 the Company put into production one of the fuel injection innovations Clessie felt he had pioneered and had revealed to one of the company engineers who had then patented it. Clessie took this as a breach of good faith and the years of dissatisfaction bubbled to the surface. After protracted negotiations and some emotionally charged meetings, the matter was put to rest and a formal contract between Clessie and the Company was signed, but not before Clessie and J. I. Miller's relationship had been sorely tested.

Perhaps the business relationship between inventors and financiers can never be resolved to the satisfaction of all parties. The corporate world is littered with the carcasses of companies that ran out of money and had to be sold or liquidated just when technical success was in sight. The Cummins Engine Company would undoubtedly be one of those except for the patience, fortitude and deep pockets of the Irwin family. Perhaps Clessie's final victory is the fact that the Irwin name is largely forgotten but the Cummins name is recognized worldwide as the premier developer of the diesel engine

1924 Cadillac Stage

The stage body was mated to the 1924 Cadillac chassis this February. Although there is a lot of work yet to be done, this was a major milestone in the restoration of the Julian stage.

Frank Ball (top), Carl Calvert (left), Sherman George (right) and Ed Carry (center) line up the stage body with the 1924 Cadillac chassis

The MTM is restoring the stage, which ran from San Diego to Julian in the 1920s. The stage body was built by Graham Brothers in Stockton, CA and installed on the 1924 Cadillac chassis that was modified to fit the body.

Most of the mechanical work on the chassis has been completed though the fitting of the radiator and the radiator shroud is not yet satisfactory. The Julian Historical Society is funding the restoration effort and will store the stage in Julian and operate it in Julian civic events when restoration is complete.

New Members

Don Marinovich of Columbia, CA has enrolled as a life member and **Eric Vanderhorst** of Chula Vista, CA has enrolled as a general member of the museum, since publication of the last newsletter. We welcome these new members to our museum.

Upcoming events

The annual **MTM Open House** will be held on Saturday April 26. See enclosed flyer for details

The **MTM Board of Directors'** meetings for the spring quarter of 2008 will be held at the Horseless Carriage Foundation library at 8186 Center St. La Mesa, CA at 6:30 PM on the following Thursdays:

May 15th **Jun 19th**

All members are invited to attend.

The **Antique Gas and Steam Engine Museum** in Vista, CA will hold its spring Harvest Fair on the weekends of June 21-22 and June 28-29. They will include farming demonstrations, blacksmith and wheelwright shop, old tractor/car parade, food, live music and more. Visit www.agsem.com for directions

Hours of Operation

The Museum facility at 31949 Highway 94 in Campo, CA is open to the public every Saturday from 10 AM to 5 PM. Admission is free, donations are accepted.

We need volunteer docents to help us staff these open days. Anyone interested in volunteering for any of the Saturdays during 2008 please call John Thomas at (619) 479-4318

MTM Officers and Directors

The officers and directors of the Motor Transport Museum are as follows:

Greg Long, President
John W. Thomas, Secretary
Carl E. Calvert, Chief Financial Officer

Directors

Reid Carroll	Jim Jensen
Roger Challberg	Steve Sackett
Bill Jellyman	Mike Anderson