COBWEBS AND OVERHEAD VALVES

by Terry B. Dunham

Throttle up. . . Ignition on. . . Twist 'er over.* Intake . . . compression . . . power . . . exhaust . . . intake . . . compression . . . power . . . exhaust. It all happened just after the turn of the century in David Buick's Detroit workshop. A Buick overhead valve engine was up and running for the first time, and automotive history would never be quite the same again.

The Buick automobile, and later the General Motors Corporation, was in large part successful because of this revolutionary new engine. Men working at Buick called the design "valve-in-head" and said their engine was better because of it. They were right! It was an engine that could operate more efficiently and with more horsepower for its size than those offered by the competition. And although the public did not fully understand horsepower, it could relate to it. Many customers wanted and could afford a more powerful automobile, and cars using the new engine sold profitably and well.

The story of this engine has remained hidden for more than 90 years. It is a story of great success and great failure, of great wealth and great poverty. Mostly though, it is a story of the great dreams of visionaries.

In the end, it is the story of an engine and the events surrounding its birth at Buick, events that went largely unnoticed at the time, but which eventually helped power the American automobile industry toward the zenith of high noon.

The overhead valve engine was the single most important mechanical factor in the early success of the Buick car. In fact, the ohv engine was one of the most important automotive advances ever. If you totaled up all the engines built with configurations other than ohv, that figure would represent just a small fraction of the total ohv engines that have been produced.

Unfortunately, the work leading up to ohv at Buick has never been completely understood. And even though a patent was issued in 1904 for development work done on a Buick design, questions have long persisted as to just who it was that should be credited with the work. Three men were involved with the design and construction of Buick engines at the time—David Buick, Walter Marr, and Eugene Richard.

Who Did What Part of the Work?

The answer to that question has remained a 90-year mystery that has never been answered with 100% certainty. After in-depth research for our book *The Buick: A Complete History*, co-author Larry Gustin and I found the record very unclear. We felt the best approach was to list the information then available and to let the men involved share the honors. New information has recently come to light, however, that will change the way historians perceive how ohv was first applied to a Buick engine.

Simply stated, the ohv engine has its valves located in the cylinder head at the top of the combustion chamber. The valve stems go through the head and are opened and closed, normally by rocker arms, which are in turn activated by push rods and the camshaft.

David Dunbar Buick, the founder of the Buick car, was one of the first to market an ohv engine in this country. Contrary to popular belief, however, it was not an automobile engine.

A consummate tinkerer and inventor, Buick became restless in his plumbing supply manufacturing business. In 1893, by his own account, he began to experiment with internal combustion engines. By 1899 he was building L-head stationary engines (valves located in the block) and two-cycle marine engines. That same year he formed the Buick Auto-Vim And Power Company in Detroit to manufacture and sell them.

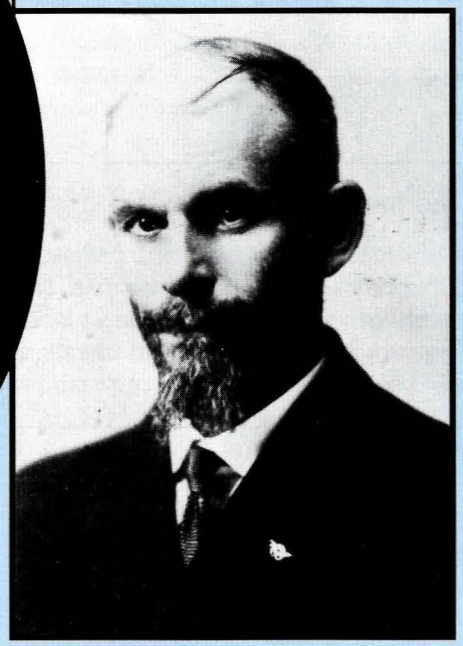
A stationary engine is exactly that.

About the Author

Terry Dunham has had an interest in the ohv design since the mid 1950s. While he and Larry Gustin were researching their book The Buick: A Complete History, *they realized that no one knew for sure who had done the first work on the ohv engine at Buick. More than 320 hours and over 5000 miles of research later, he now presents everything that is now known about the subject adding that "someday we may know even more."*

*Many of the early stationary engines, David Buick's included, had large exposed flywheels. In order to get one of them started, you grabbed onto the flywheel with both hands, brought the piston slowly up on compression, and then twisted hard to fire the plug and get the engine into its power stroke. "Twist 'er over" was an early term that meant to manually start an engine.

David Dunbar Buick, founder of Buick Motor Company.



Walter Lorenzo Marr, chief engineer of Buick Motor Company and builder of first experimental Buick in 1900.

It is not intended to move a vehicle down the road as the engine for a car or a motorcycle would. Instead, it is designed to remain in one place (stationary) and to act as power for a pump, machinery, saw, or one of the many other needs commonly found on farms and in industry some 90 years ago. Buick had customers in the usual farm and industrial markets in mind when he first started the Auto-Vim and Power Company. But he also wanted to build engines that could be used to power boats. The marine engines he produced in Detroit were among the first designs offered by the firm.

It has never been clear just who was responsible for the development work done on the first engines built by Auto-Vim & Power, but it was probably David Buick and his son Thomas. in later years Walter L. Marr, Buick's first chief engineer, stated that he had built some of the first marine motors for David Buick, including one that beat everything in its class on the Detroit River.

The L-head configuration was considered state of the art in those pioneering days. However, the L-head design is inefficient by its very nature because it will not breathe well, and the first Buick stationary engines were no exception.

At some point, wanting to improve his engines, Buick went looking for help. As luck would have it, he managed to bring together two of the most talented engine men in the country.

Walter L. Marr worked for David Buick at least three times during his career. He started first in 1899 and stayed until the spring of 1901. History would see Marr have a great impact on both the Buick automobile and the automobile industry during much of his life.

In addition to Walter Marr, Buick also hired Eugene C. Richard, an inventor, draftsman, and machinist. Richard was born and raised in France and had considerable experience there with steam engines, some of which placed their valves above the piston. He got further training in Philadelphia and worked for Oldsmobile while the company was located in Detroit.

The Patent

The mail room at the U.S. Patent Office received an application from Richard to patent an explosion engine (internal combustion engine) using the ohv principle on February 18, 1902. Documents in the patent file indicate that paper work for the application had been started by Richard and his attorneys as early as November 29, 1901.

The application was rejected by the patent examiner three times. As originally submitted, it included a claim for a water-jacketed valve guide that was found to be in conflict with earlier patents. The first two rejections were unsuccessfully appealed by Richard and his attorneys. After the third rejection, the application was amended on April 5, 1904, and a patent was subsequently granted on September 27, 1904.

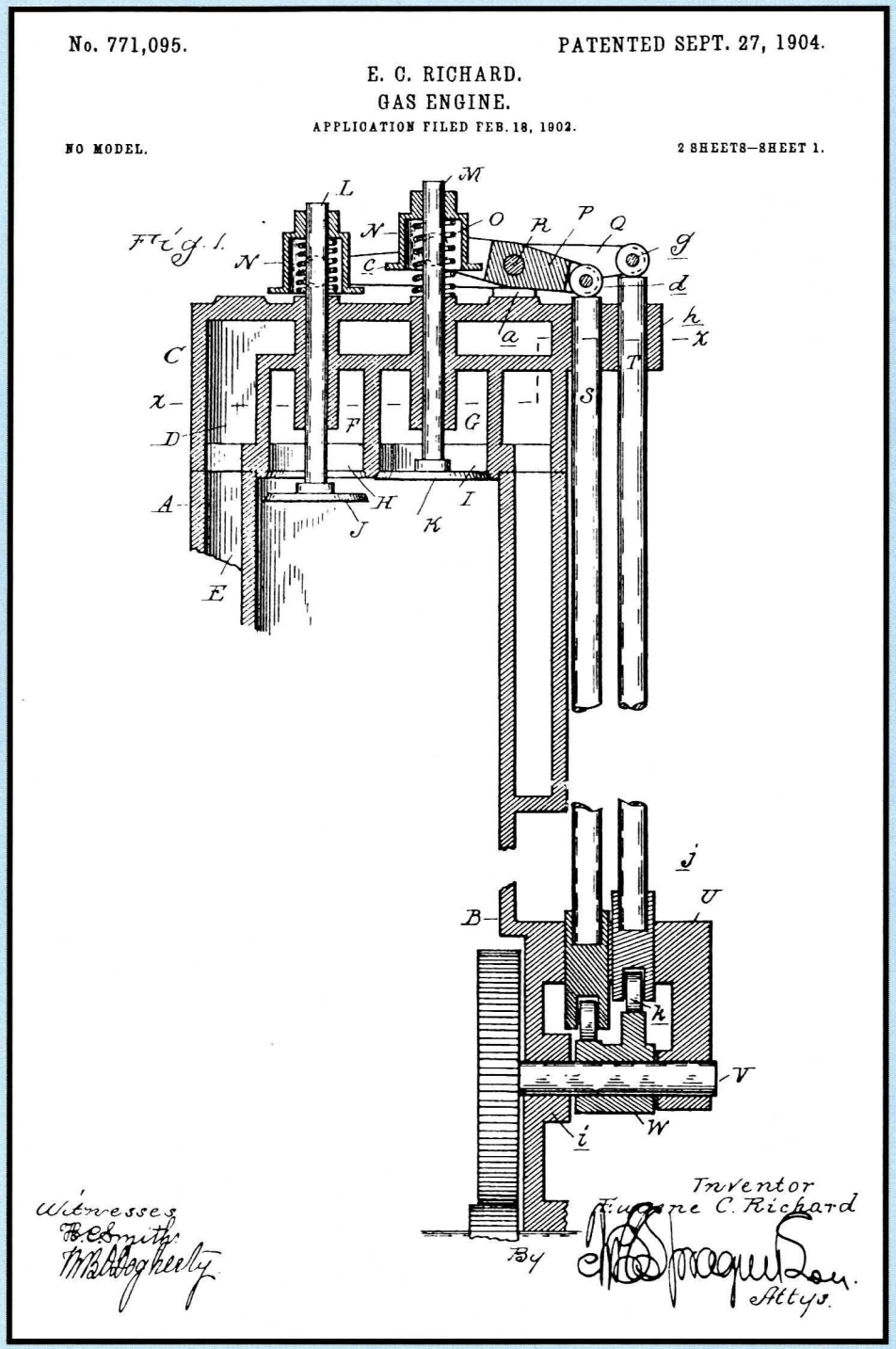
On April 4, 1904, knowing that a patent was about to be issued, Richard assigned his rights, for "value received of $1.00," to the Buick Motor Company then located in Flint. At the time the application was originally filed, Richard had been working for the Buick Manufacturing Company in Detroit.

Buick Manufacturing Company

David Buick had established the Buick Manufacturing Company in 1902 when a need for additional capital forced him to reorganize the Buick Auto-Vim And Power Company. He remained as president, and according to Arthur Pound's *The Turning Wheel*," a history of General Motors published in 1934, "the L-head motor was soon scrapped in favor of the new motor."

The first Buick catalog was published in late 1902 or early 1903. It depicted the stationary engines then being offered by the Buick Manufacturing Company and reprinted a November 30, 1901, customer letter from an Albert Stegmeyer. Stegmeyer wrote that he had had considerable success competing against other boats on the Detroit River using a 3-hp Buick marine engine and a 20-ft. launch. The letter also stated that Stegmeyer had purchased the launch and engine directly from the Buick company.

Interestingly, the Stegmeyer name



No. 771,095. PATENTED SEPT. 27, 1904.

E. C. RICHARD.

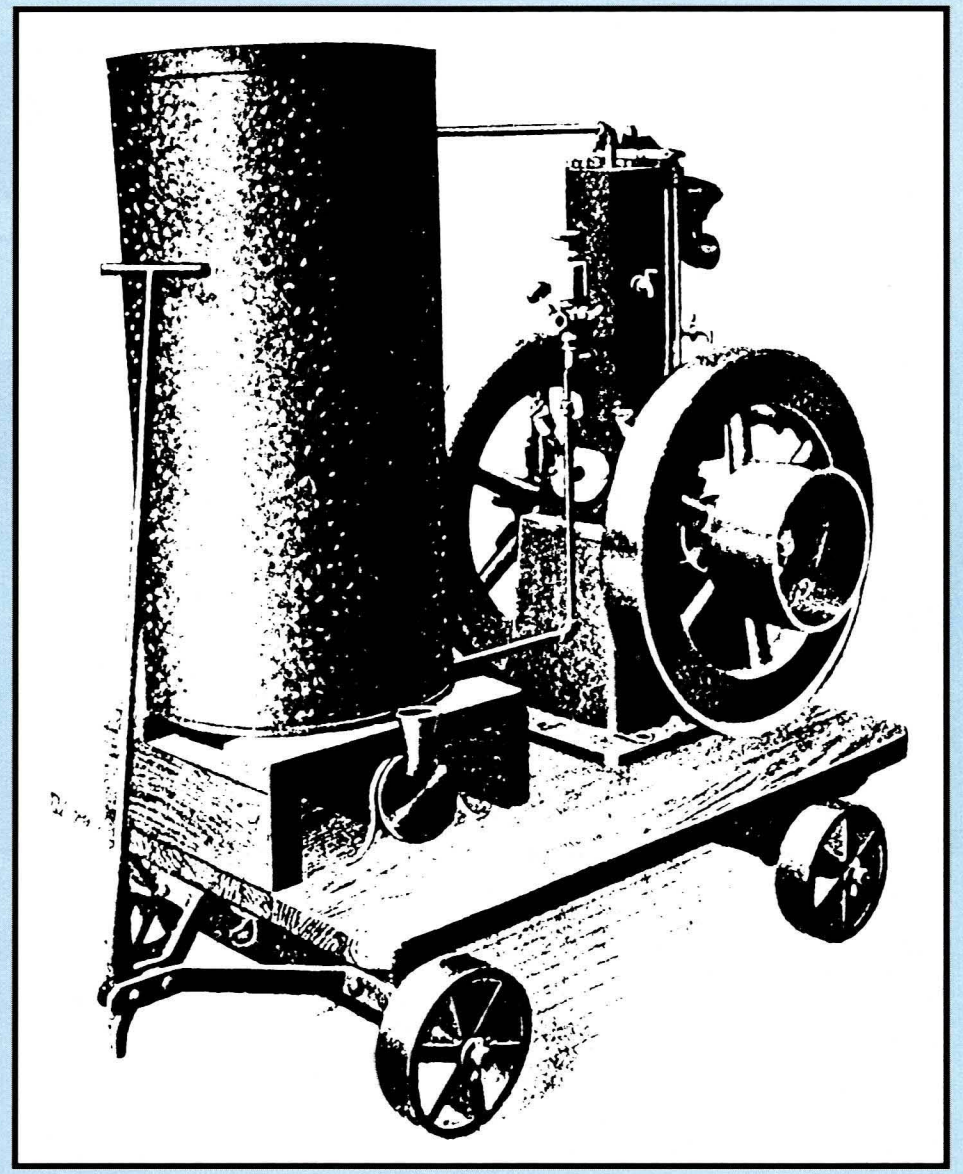
GAS ENGINE.

APPLICATION FILED FEB. 18, 1902.

NO MODEL. 2 SHEETS—SHEET 1.

Witnesses
R. C. Smith.
M. A. Hoghkeely

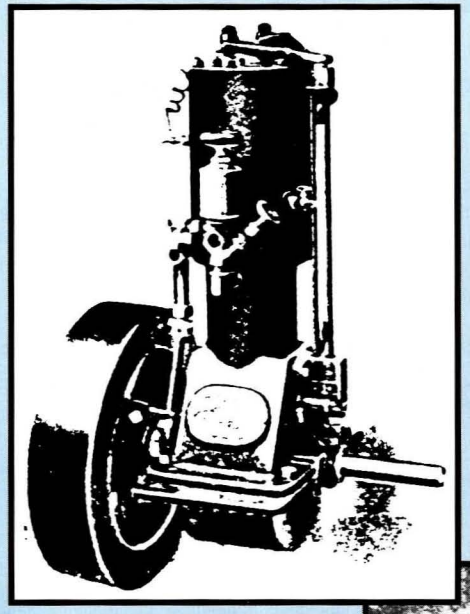
Inventor
Eugene C. Richard
By Chas. S. Sprague Son.
Attys.



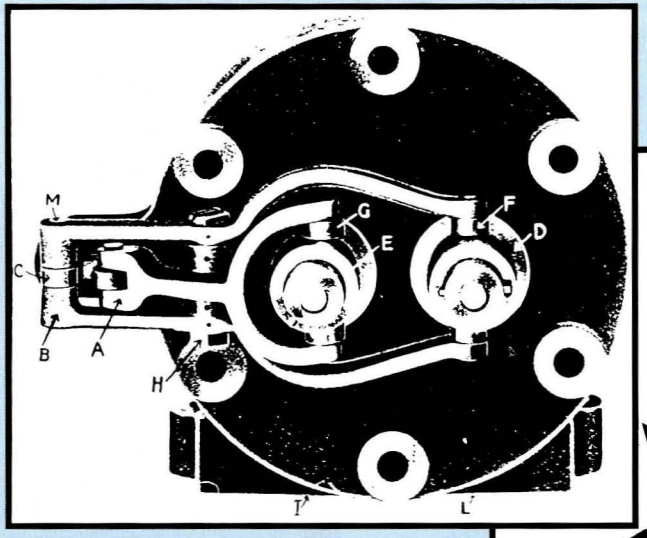
Stationary ohv engine from Buick *catalog printed in* Flint.

also appears in a letter from David Buick to Walter Marr. The Buick letter, dated April 5, 1901; was an offer to sell Marr "the automobile known as the Buick automobile," and several engines. An engine "known as Stegmeyer's engine," along with five others, is specifically excluded from

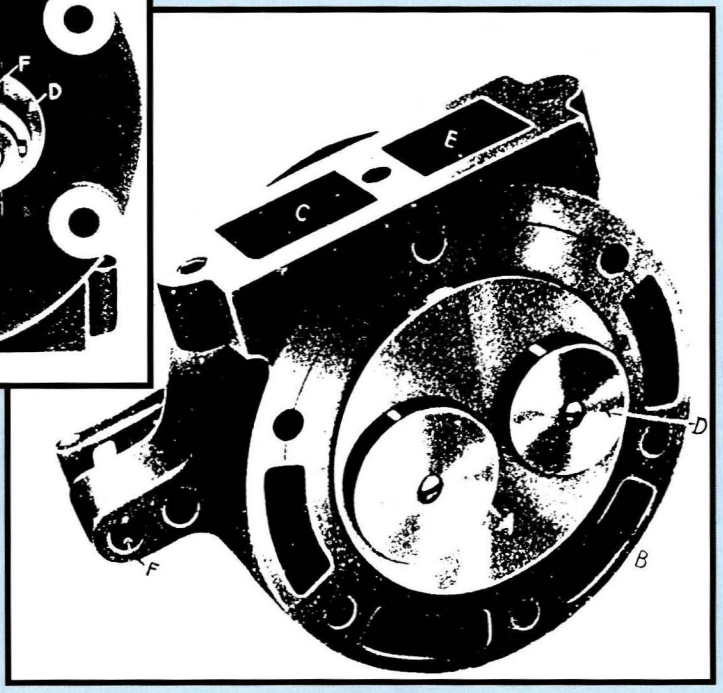
Richard's patent for ohv engine. (*Reproduced from* The National Archives)



Marine 4-cycle ohv stationary gasoline engine from Buick catalog printed in Flint.



*Top view of cylinder head of Buick ohv engine. **A**, exhaust lever; **B**, inlet lever; **C, F, G**, antifriction rollers of hardened steel; **D**, inlet valve stem cap; **E**, exhaust valve stem cap; **H**, hardened steel pin that forms the fulcrum for the levers; **I**, exhaust port; **L**, inlet port; **M**, hardened steel pin on which rollers turn.*



*Underside of detachable head assembly of Buick ohv engine. **A**, exhaust valve; **B**, cylinder head, which is amply water-jacketed all around the valves; **C**, exhaust port; **D**, inlet valve; **E**, inlet port; **F**, bearing for sliding rod.*

First experimental Buick automobile was built in 1900–1901 and sold in 1901 to Walter Marr. Marr and his wife, Abbie, are shown in what is believed to be that first Buick.

the agreement. The reference to a "Buick automobile" represents the first known mention of a Buick car.

It is very likely that Stegmeyer's launch and engine are the same ones Marr referred to when he talked about his work in developing the first marine engines at Buick. The engine that "beat everything on the Detroit River" was probably Stegmeyer's.

On page 12 of the catalog is what appears to be the first publicly printed reference ever made to overhead valves in an internal combustion engine: "The inlet and exhaust valves are in the head of the engine, so should it become necessary to regrind or reseat the valves it would not be necessary to take the entire engine to a machine shop to have them reground or reseated, but simply take the head, which in a 4 h.p. engine, does not weigh more than 10 pounds. This is a great advantage over most all other engines, as you would have to take the entire engine to the machine shop to have any repairs made to it."

What the catalog is saying here has historical importance. Instead of stressing the power and efficiency of the ohv engine, which were later to become Buick trademarks, Buick was then stressing ease of service.

In fact, documents describing the invention, which Richard filed with his patent application, state: "The construction described is especially designed with a view to simplicity and ease in manufacture and also the facility with which the parts may be assembled or detached when necessary."

In an interview held years later, Walter Marr talked about the pioneering work on what he said was the first engine he had built (not a Buick engine) using the ohv application. Marr stated the valves were first located in the cylinder head because, owing to the way the motor was de-

signed, they could not be put in anywhere else. The discovery he said, came by accident. Marr's comment, taken together with what the catalog calls "a great advantage" and the statement in the 1902 patent documents, clearly indicates that ohv was first applied to engines for mechanical and serviceability reasons, not because the designers expected more efficiency and power. Buick, Richard, and Marr must have been very pleasantly surprised when they tested their first ohv engines and discovered the horsepower they developed. The full significance and importance of ohv was not realized until sometime later.

Interestingly enough, the catalog lists no engine specifically designed as an automobile power plant, but does make the following reference on page 14: "By substituting a suitable base in place of the base used on stationary engine, also fly wheels, it is made into a marine engine. It also can be adapted for automobile purposes, by a few simple changes." Buick was telling his customers how to take one of his stationary engines and convert it to marine and automotive applications.

Buick Motor Company

David Buick reorganized his business again on May 19, 1903, as the Buick Motor Company. In late 1903 he moved the business from Detroit to Flint where a second catalog was printed. The Flint catalog listed the Buick Motor Company as the name of the firm but continued to use much of the same information presented in the earlier Detroit edition. However, a two-cycle marine engine, rated one hp at 600 rpm had now been added. With the Buick name later becoming synonymous with ohv, it is difficult to believe the company ever built and sold an engine that used no valves at all, but it did. In fact, there is evidence to indicate that several different two-cycle engines had been built and tested as early as the spring of 1901.

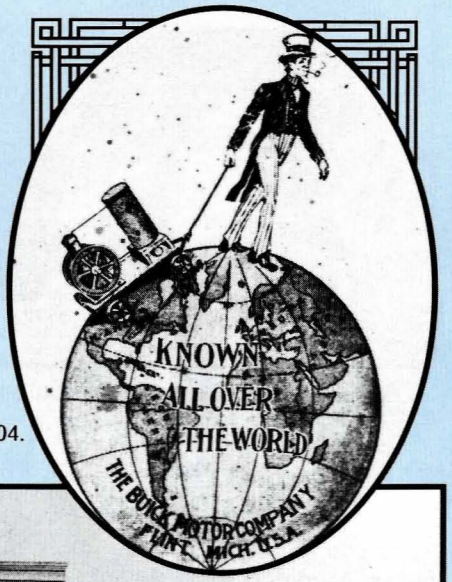
Also shown in the Flint catalog were Buick's new automobile engines. The first, a horizontal, single-cylinder L-head with a 5″ × 6″ bore & stroke, was rated 6.6 hp at 580 rpm. It weighed 273 lb. and was priced at $150. The second, a two-cylinder opposed ohv engine, was rated 12 hp at 800 rpm. It weighed 310 lb. and was not priced. Both were furnished with "sparking plugs" and a carburetor.

The last company publication to feature a stationary engine was a small folder printed in 1904. As an indication of how rapidly the industry was changing at the time, the engine shared space with the Model B, Buick's first production car.

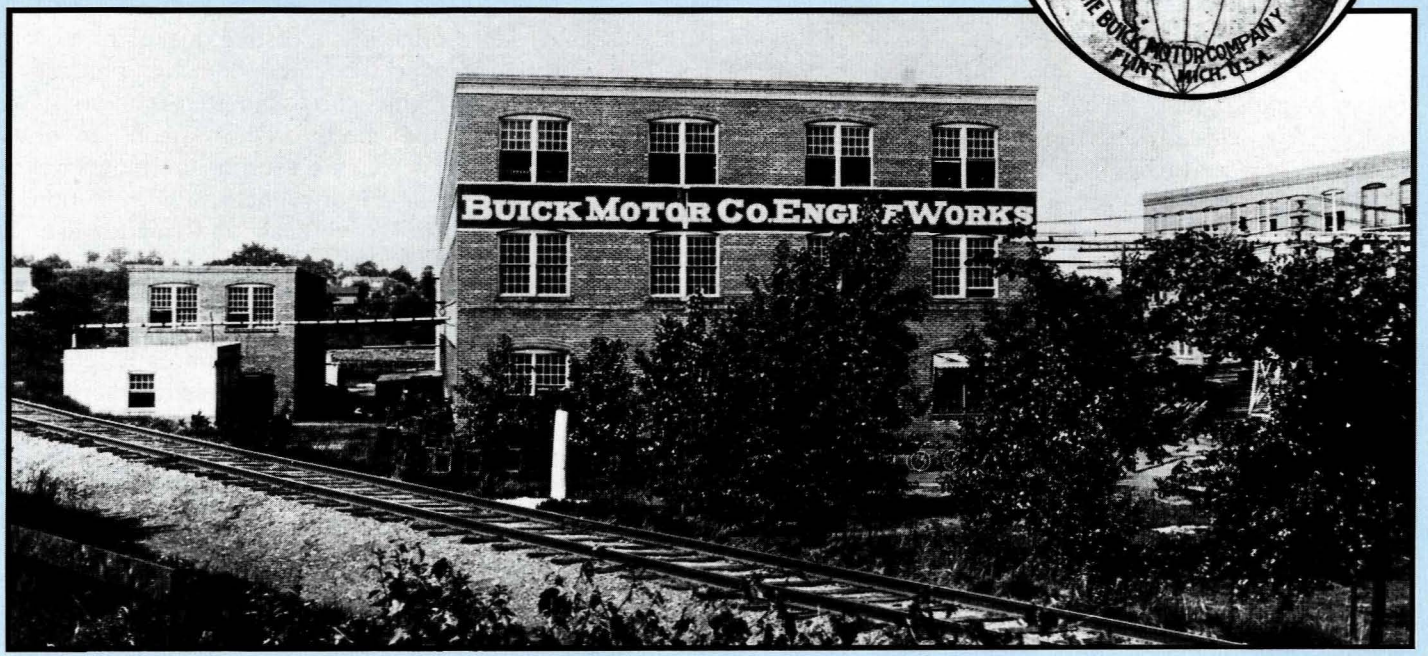
Conventional wisdom says that Richard must have applied what he knew about the principle of locating valves in steam engines to a new internal combustion engine he was working on in David Buick's shop, and submitted his patent application. All this would appear to make Richard the father of the ohv design at Buick, but it is not quite that simple. History says there is more to be considered.

Walter Lorenzo Marr

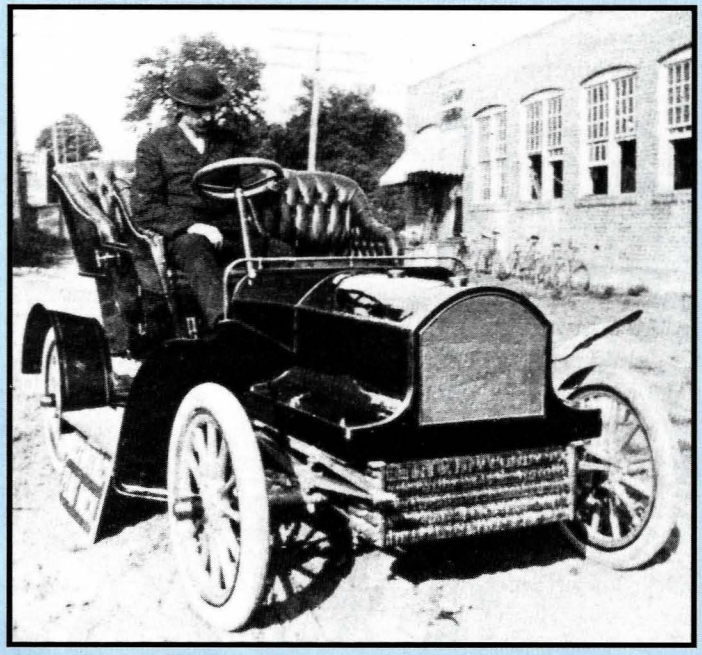
Walter Lorenzo Marr had begun working with David Buick at about the same time Richard went to work for the company. Marr was a brilliant engineer and had earlier built and tested some six different engine designs.



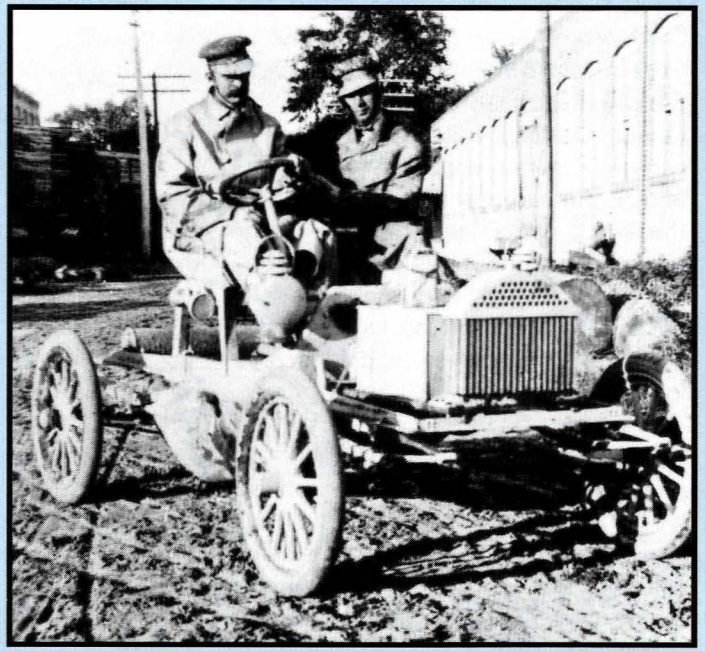
Artwork from second Buick catalog, 1904.



First Flint Buick factory, on W. Kearsley Street near Flint Wagon Works. Originally one story in 1903, it later was expanded to three stories.



Walter Marr in first production Buick, a Model B, built in 1904 in Flint.



Walter Marr, at the wheel, and Thomas D. Buick, son of David D. Buick, return to Flint from Detroit on July 12, 1904, the first major test drive of the first Flint Buick.

Descriptions of the development work completed by Marr before he began working with Buick indicate that he was virtually at the cutting edge of engine technology in this country at the time. His work included experience with two-cycle, four-cycle, opposed, and vertical engines, as well as an experimental bicycle motor and an engine for a two-passenger motor tricycle he had built.

Marr was born in Lexington, Michigan, about 20 miles north of Port Huron, in 1865. His father died when he was six. He was apprenticed to the engineering firm of John Walker and Sons in East Tawas, Michigan, in 1882, and from 1887 to 1896 he worked in Saginaw for Wickes Brothers, an engineering firm involved with steamboats and sawmills. It was at Wickes Brothers that he first began working with internal combustion engines. After leaving the Wickes firm, Marr started a manufacturing business in Saginaw and produced the Marr bicycle. Two years later he moved the company to Detroit.

In 1888 Marr constructed his first engine, a single-cylinder, $4\frac{1}{2}'' \times 5''$ bore & stroke, using steel castings. The motor ran on the Otto principle, (four cycle) was water cooled, and utilized hot tube ignition. Marr oversaw a number of developmental experiments using the engine, some of them involving carburetion.

Between 1888 and 1898 Marr got what the October 1921 issue of the *Buick Bulletin* called "first hand knowledge of six distinct makes of motors, which enabled him to produce a highly successful four-cylinder gasoline motor-driven wagon" in 1898. The engine used in the motor wagon was a four-cylinder, $2\frac{3}{4}'' \times 5''$ bore & stroke vertical and made use of "novel electric ignition features, arranged to advance the time of the hammer spark production." The term "hammer spark" is an early reference to the instant combustion that begins in a cylinder. The reference to Marr's work with "novel electric features" would indicate that he had successfully developed one of the first spark advance mechanisms.

In 1899 he built the motor-driven two-passenger tricycle mentioned earlier. In 1900 Marr built a second motor wagon with a single-cylinder horizontal engine utilizing jump-spark ignition. This second motor wagon is probably the car that is now considered to be the first Buick. The *Bulletin* claimed that his work with the jump-spark ignition made Marr "one of the first engineers to experiment with it."

The *Bulletin* article continued:

> Unlike other designers of the time, Mr. Marr believed in adhering to one type of motor. Because of his experience and research work with the different varieties of motors, he had become a staunch advocate of the valve-in-head principle, because its simplicity was backed by all that was then known of thermal efficiency and also because its design formed a more logical basis for development than other types.
>
> Naturally the first Buick motor was of the valve-in-head type. It proved to his satisfaction that the theories which seemed correct to him were right in actual application. And since that time, he has devoted his energies to the perfection of the Buick valve-in-head motor.

Some of this appears to be public relations speculation. However, it does present the claim that Marr was involved with early development work on an ohv engine and was familiar with the ohv design, prior to working with David Buick. The article also makes the point that Marr, like Richard, would have had exposure to steam engine design and its valve placement, due to the nature of the work Wickes Brothers was involved in.

Much of the information on Marr's early career as published in the *Buick Bulletin* is supported by another article on the Marr Auto-Car in the October 1903 issue of the *Cycle and*

Automobile Trade Journal. The Marr Auto-Car plant, located in Elgin, Illinois, produced a Marr-designed vehicle from 1903 until August of 1904, when the plant burned. Even though the Marr Auto-Car used an overhead valve overhead cam engine, and was probably the first car of any real volume made in this country to use ohv, the design was not mentioned as a feature in the sales brochure. The significance of ohv still had not been fully realized.

The *Journal* article also says that the 1888 engine experiments covered just over 3 months and that Marr left Wickes Brothers in 1896 to open his own bicycle manufacturing shop. According to it, Marr sold the bicycle business in 1899, worked for the Detroit Shipbuilding Company for a short period, and then went to work for the Buick Auto-Vim and Power Company.

Early 1901 saw David Buick (no slouch himself in engine construction) working with both Richard and Marr. Work on a Buick ohv engine had probably been started by this time, but there is nothing to document it. However, there is documentation in a letter from Buick to Marr dated March 25, 1901 indicating acceptance of a Marr offer to resign. Marr did in fact leave the company in late March or early April.

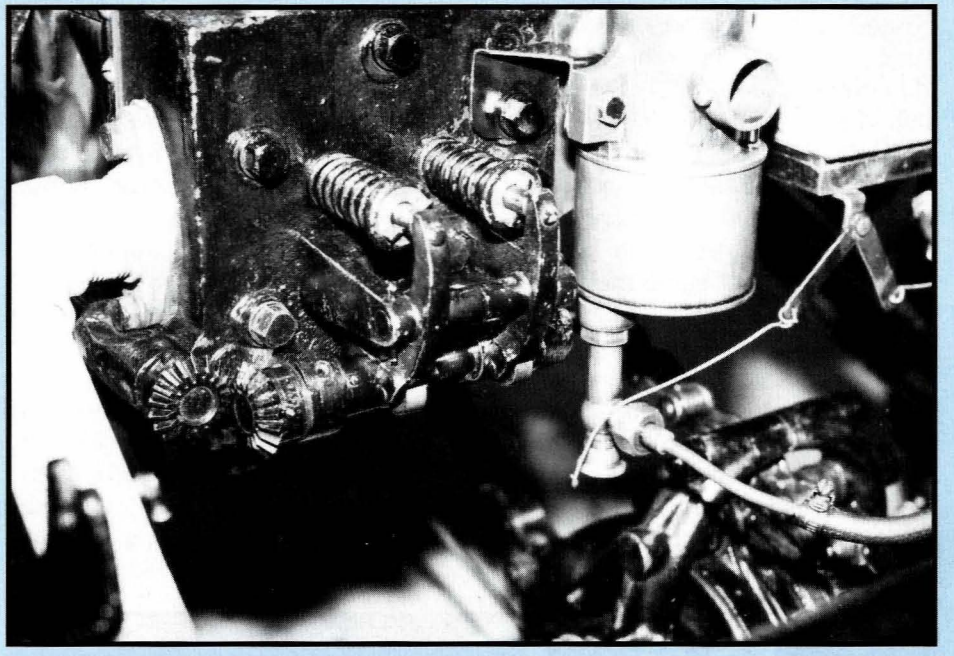
Eugene Richard

On May 23, 1903, a contract was signed between David Buick as president of the Buick Manufacturing Company of Detroit and Eugene Richard. The contract specified Richard's duties as "that of designer and inventor, and head of the drafting department." A later section stated that Richard was to apply for patents on anything he may have invented or designed in connection with automobiles, gasoline engines, etc.

Detroit businessman Benjamin Briscoe, Jr., knew Buick, Richard, and Marr well. He was closely associated with the early automobile industry in Detroit, and in 1921 he wrote that in his opinion, the industry owed to Richard "the original proper application of the ohv principle."

The Turning Wheel by Arthur Pound covers this period in Buick history and says that Richard had been working with David Buick a bit before Marr became involved. This, however, may not be the case. Other sources place Richard's first date of employment at March or April of 1901. If this is accurate, then Buick must have hired Richard to replace Marr, who would have just resigned. It also means that if Richard was responsible for much of the work on ohv, then the design would have to have been completed between the spring of 1901 and that following November when the first patent documents were drawn up by the attorneys. The Pound reference to Richard's employment date might be correct, however, if it involved the second time Marr was employed by David Buick. The dates on customer letters in the Detroit engine catalog indicate that the first Buick ohv engines were probably sold to the public in the spring or summer of 1902.

Pound also observes that "documentary evidence [the 1902 Patent application] indicates that the first steps (toward ohv development) were taken by Richard." He also states that Marr gave the ohv motor "it's distinctive name" (valve-in-head). But again, these two opinions not withstanding, it's not quite that simple.



Cylinder head and overhead camshaft on sole remaining Marr Auto-Car. (Courtesy of Jerry Martin)

Over the years most historians have usually assumed that what Benjamin Briscoe wrote in his 1921 letter and what Arthur Pound wrote in his 1934 GM history book represented the facts as they actually happened. Unfortunately for Buick history, it wasn't that way at all. What actually did happen turned out to be one of the most fascinating stories in the history of the automobile industry, involving a personal fortune for one of the three men involved in the development of ohv and poverty for another. It also involved intrigue, secret meetings and back-dated documents, all of which had a great impact on no less than the formation of the General Motors Corporation itself.

The Rest of the Story

In 1914, concerned with his deteriorating health, Walter Marr and his wife, Abbie, bought a home at Signal Mountain, Tennessee, and made their residence there. Marr continued his engineering work for Buick until the early 1920s and became philanthropic in the community. Before he died in 1941 he gave several interviews to the local newspaper.

In an interview with Sam Adkins of the "Chattanooga Free Press,"

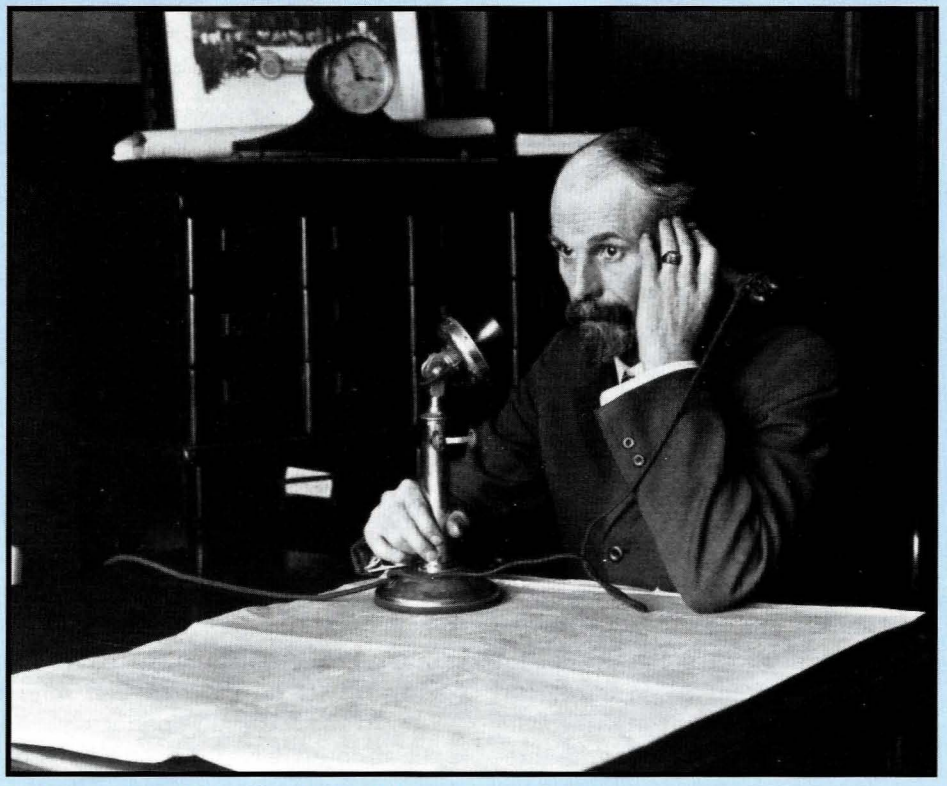
printed October 4, 1936, (not the same interview referenced earlier) Marr directly addressed the conclusion drawn by Pound in *The Turning Wheel* that it was Richard who had first applied the ohv concept.

Marr stated in the interview that "what he (Pound writing in his book) didn't say is that I made the valve-in-head device first because it was the easiest way to make a motorcycle engine." You just can't get much clearer or more specific than that. In fact, in yet another interview, Marr stated it was the engine for the two-passenger motor tricycle he had constructed in 1899 that was his first application of ohv.

The Durant-Marr Contract

A document filed decades ago with Marr's personal papers has just been discovered and made available by the Marr family. It appears to answer many of the questions about ohv that have long puzzled historians and supports Marr's claim to have built an ohv engine before the first ohv engine was built at the Buick shop in Detroit.

The information is contained in an intriguing 1905 business agreement between Marr and William C. "Billy" Durant. It was Durant who then headed up Buick, and who in 1908, using the financial strength of Buick as a foundation, formed the General Motors Corporation.



Walter served as chief engineer for Buick from 1904 until 1914.

Durant was represented in Flint by the legal firm of Carton and Bray. On August 1, 1905, John Carton, one of the firm's partners and Durant's trusted friend, drew up a 5-year employment contract between Durant and Marr. In addition to setting forth the terms of Marr's employment compensation, which are best described as generous since the agreement would eventually make him a multi-millionaire, it assigned to Durant certain automobile-related patent rights that had originally been granted to Marr in 1903 and 1904.

An unusual part of the agreement also gave Durant the exclusive use of what is termed "improvements in explosive engine construction invented by party of the first part [Marr], but not patented for business reasons." The contract further stipulated that Marr had to write out, place under seal, and deliver to Durant, information concerning the unpatented invention, so that it would be available to Durant "in case of first party's death." Durant obviously felt the information was vitally important to have had the contract worded in this manner.

All this subterfuge can be nothing other than a veiled reference to Marr's early development work on ohv. Wording in the Richard patent deals specifically with "improvements in an explosion engine," the same terminology used in the contract. No other work patented or unpatented that Marr was involved with during this period even comes close to having the importance to Durant and Buick that ohv did.

The Marr invention "not patented for business reasons" is also a clear reference to the Richard patent. If the invention was as important as the wording in the contract would indicate, then surely it would have been patented by Marr if he could legally have done so.

The rights to ohv had previously been assigned by Richard to the Buick Motor Company in Flint in April of 1904. But that was before Durant took over Buick. Problems must have arisen, or Durant was afraid they might, over the right to use the ohv design between then and August of 1905 when the contract was drawn up. By this time the parties involved had begun to realize how important the rights to the ohv technology actually were.

There is even more to document that Marr was involved with, or at least knew about the ohv design, prior to the submission of the Richard patent application. At about the same time David Buick decided to accept Marr's offer to resign on March 25, 1901, Marr contacted Charles G. Annesley, who was then working with the Buffalo Gasolene Motor Company in Buffalo, New York, and asked for a job.

Annesley and Marr had been good friends for several years. In September of 1899 Annesley was located in Marr's shop on Second Avenue in Detroit working on a car with a four-cylinder engine. At the same time Annesley was working on his car, Marr's motor tricycle was in the shop under construction. The

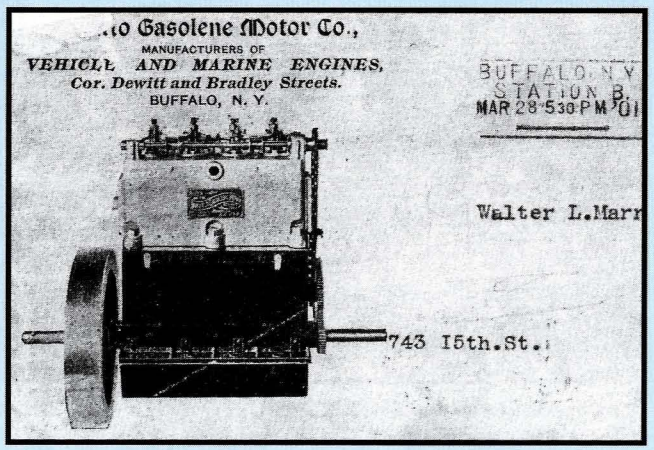
September 5, 1899, "Motor Vehicle Review" describes the engine in the motor tricycle by saying, "His motor is a source of great pride to him [Marr] and creates general admiration on account of its very small size. He designed it himself, and it sits most inconspicuously in its bracket under the seat on the tricycle. This machine will soon be completed and will be given a trial. If it is a success Mr. Marr will organize a company to manufacture the new tricycle and place them on the market." The motor being described here is the same one Marr later said was his first use of the "valve-in-head" device.

Annesley responded to his friend's request for a job on March 28, 1901, with a letter that has since become a classic with automotive historians and is reproduced here.

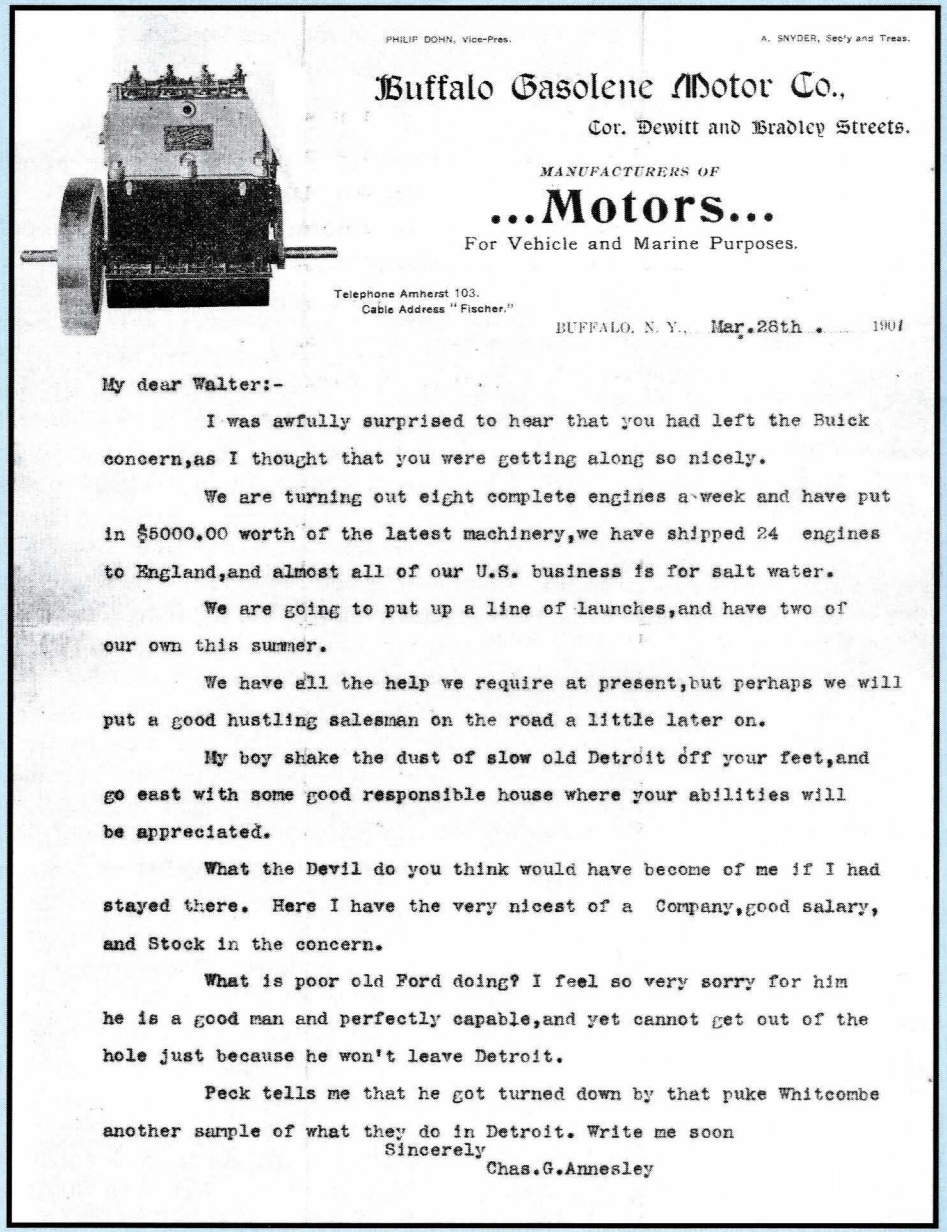
A cut of one of the engines built by Annesley's firm in 1901 is printed on both the letterhead and the envelope. Close inspection of the illustration shows a four-cylinder engine using an overhead cam. In 1902, advertisements describing the engine indicate that it used a rare valve configuration called an F-head. The F-head has one valve installed in the head as ohv, and one in the block as an L-head.

The October 1903 *Cycle and Automobile Trade Journal* article credits Marr with building his 1898 four-cylinder motor wagon and states, "the manufacture of this form of engine was taken up by the Buffalo Gasolene Motor Company and is now largely made in various sizes for automobiles and small boats." If Marr's 1898 engine was indeed an F-head, then an 1899 ohv engine for the motor tricycle would be a logical progression.

The Marr contract is an important historical document for another reason. On September 11, 1905, just five weeks after the date on the contract, Durant had Carton file the necessary papers with the state of Michigan to get Buick Motor Company capital stock increased to $1.5 million. But there was a bit of a problem; the documents Durant had Carton file assigned a $60,000 value to "the ownership of invention of combustion engine construction not patented for business reasons." Additionally, the documents made reference to contractual agreements that were not thoroughly described. The Michigan



Marr left Buick in 1901. This letter is in response to Marr's application to Charles G. Annesley for a job. Note engine on letterhead and envelope.



PHILIP DOHN, Vice-Pres. A. SNYDER, Sec'y and Treas.

Buffalo Gasolene Motor Co.,

Cor. Dewitt and Bradley Streets.

MANUFACTURERS OF

...Motors...

For Vehicle and Marine Purposes.

Telephone Amherst 103.
Cable Address "Fischer."

BUFFALO, N. Y., Mar. 28th, 1901

My dear Walter:-

I was awfully surprised to hear that you had left the Buick concern, as I thought that you were getting along so nicely.

We are turning out eight complete engines a week and have put in $5000.00 worth of the latest machinery, we have shipped 24 engines to England, and almost all of our U.S. business is for salt water.

We are going to put up a line of launches, and have two of our own this summer.

We have all the help we require at present, but perhaps we will put a good hustling salesman on the road a little later on.

My boy shake the dust of slow old Detroit off your feet, and go east with some good responsible house where your abilities will be appreciated.

What the Devil do you think would have become of me if I had stayed there. Here I have the very nicest of a Company, good salary, and Stock in the concern.

What is poor old Ford doing? I feel so very sorry for him he is a good man and perfectly capable, and yet cannot get out of the hole just because he won't leave Detroit.

Peck tells me that he got turned down by that puke Whitcombe another sample of what they do in Detroit. Write me soon

Sincerely

Chas.G.Annesley

Department of Corporations had a hard time understanding things and contacted Carton, asking for an explanation. That presented another problem; Carton didn't know what they referred to either!

On September 20, 1905, Carton, working at his office in Flint, sent a letter to Durant, who was then headquartering at the Buick plant in Jackson, and outlined the situation:

My Dear William:

The Corporation Department of the Secretary of State's office has returned the amendment sent for record, with his objections to the same. The only objection which it has is that the property taken in payment of the increase of the common stock is not sufficiently described. This you will see by their letter which I enclose to you, and I also enclose a leaflet containing instructions. The suggestion in the letter as to payment of the preferred stock, I have taken up with him today by phone and now that he understands it he is in agreement with that portion of it, so that is out of the way. The only thing left for us to do is to sufficiently describe the property taken in payment of the common stock. I am of the opinion that you ought to run over here and take this matter up with me quietly and without any discussion among the other directors, because it is evident that we will have to describe the property. I say this, not only from what Mr. Kennedy says in his letter, but from what he said on the phone. I do not know anything about the contracts or patents referred to and assume that we should confer about them before correcting the certificate. Let me know at once when you will be here, and I hope you will come without delay, because this is now the important thing in the business.

The ramifications of Carton's letter are fascinating. First, Carton has asked Durant for important information concerning the finances of the Buick Motor Company and suggests that the other directors not be consulted. Secondly, even though the Durant contract with Marr specifically listed by individual patent number the patents being assigned, and even though the contract was dated by Carton several weeks prior to this letter, Carton says that he has no knowledge of either "the contracts or patents." It would appear that as a result of the questions raised by the Michigan Secretary of State's Office, Carton secretly met with Durant, drew up the Marr agreement, and then back dated it so that it would satisfy the State of Michigan!

To proceed in this manner would have been very typical of the way Durant and the men around him were then approaching the business of the Buick Company. Being timid was not the way to build up Buick's business or to later form General Motors. And the one thing you could never accuse Durant of was being timid. Automotive history would eventually view the ohv "asset" as having been vital to the early success of the Buick. If anything, ohv was worth a lot more than the $60,000 assigned to it.

The $60,000 value Durant placed on Marr's ohv "not patented for business reasons" invention becomes even more significant when compared to the value of the other assets he listed. Of the $115,000 taken in property for the stock increase, these values were assigned to other Marr inventions: Patent 576670, a steering gear, $10,000; Patent 765498, a transmission, $2,500; Patent 736415, another transmission, $2500; and for a carburetor that was still awaiting patent approval, $10,000.

Durant also assigned values of $25,000 to a contract with Weston Mott, and $5,000 to land in the city of Flint. The combined value placed on the balance of the listed property did not equal the $60,000 Durant had assigned to ohv. A record of these documents, still on file with the state of Michigan, indicates that the rights to the inventions Marr first assigned to Durant were reassigned by Durant to the Buick Motor Company on September 12, 1905, just one day after the Marr agreement was dated. Given what is known to have happened with the Marr contract, the assignment of rights must have been back dated too.

In Conclusion . . .

As a result of Durant's high-stakes financial maneuvering, the ohv engine played an even more important role in the history and financial success of the Buick car than has been previously realized. Since Buick contributed vital capital to the formation of General Motors in 1908, and then continued as the most profitable business within GM for years to come, a good case can be made for the argument that without the Buick ohv engine, there might not be a General Motors today.

Taking into account the information contained in Marr's newspaper interviews, the employment contract, the $60,000 asset listed as justification for the stock increase, and the trade journal references, it becomes clear that Marr applied ohv to an engine first, before the first ohv engine was

Rare photo of David Buick (seated at desk) and Walter Marr. One of two photos known to have been taken of them together, probably at Jackson plant circa 1906.

David Buick as he appeared in 1924.

built at the Buick Auto-Vim and Power Company. Considering Marr's previous experience with ohv, he may well have suggested the design to David Buick as a way to improve on Buick's L-head stationary engines. The problem here is that Marr did not file a patent application for the ohv engine he designed for the 1899 motor tricycle, notwithstanding the fact that he may not have been responsible for the later ohv work done at the Buick shop in Detroit.

But this still leaves the question as to just who should get credit for the bulk of the work done on the first Buick ohv design. The answer would solve the only remaining part of the ohv puzzle. Eugene Richard has always been a strong candidate for the honor because of his patent. Richard also worked at Buick for a time after the company moved to Flint and began building automobiles there. But he was never interviewed or quoted in the press.

Today, Richard's youngest son, Eugene D. Richard, now 81, remembers having once asked his father if he had indeed invented ohv. Richard responded testily that he could not understand why "everyone was so interested in that"; he went on to say that the design had first been invented in Europe and that he had just "applied it to a Buick engine." Richard's irritation with his son's question would indicate that questions about ohv have persisted for a long long time.

And what about David Buick? He was, after all, the owner of the Buick Motor Company and the man Marr and Richard both took direction from.

An historical reference that gives David Buick some of the credit has only recently been discovered in the personal papers of John Carton. On May 7, 1906, Durant wrote an enthusiastic letter seeking stock subscriptions for a new motor car company he wanted to form. In the early paragraphs, Durant reviewed some of the reasons for Buick's strong growth. He then went on to praise the Buick engine by saying, "Our motor (the highest powered engine in the work size of cylinders [displacement] considered) is conceded by all gas engine experts to be one of the greatest improvements in gas engine practice ever designed." In the final paragraphs, Durant wrote brief remarks listing the qualifications of the directors of the Buick Motor Company. He had this to say about David Buick. "Mr. D.D. Buick is a gas engine expert and is very largely responsible for the creation of the marvelous motor which bears his name. Mr. Buick is under contract with this company for a term of years, as is his associate, Mr. W. L. Marr, equally well known and talented." Durant's remarks represent the oldest contemporary credit for ohv at Buick that can be documented.

The letter says something else here that is very interesting. Instead of referring to the "marvelous car which bears his name," Durant refers to its "marvelous motor." Instead of placing the major emphasis on the Buick car being sold by his company, Durant placed his emphasis on its engine. A car could be built and sold by anyone. But only one manufacturer, Buick, could build and sell a car with a more powerful and a more efficient engine, protected by a U.S. Government patent. From his very first days with the company, Durant realized where the real market value lay with the Buick automobile.

To say the least, these are highly unusual circumstances. Because of his patent, it is easy to see why Eugene Richard has since been credited with the first use of ohv, both here in the United States and on a Buick engine. Successful work on an ohv design is known to have been completed in Europe, prior to Marr's accomplishments.

Taking Durant's comments into account, Richard may well have worked with David Buick to design and build an ohv engine, with Buick directing the work. When the engine was far enough along to apply for a patent, Buick had Richard complete the application in Richard's name. It would not have seemed important at the time to have put it in Buick's name. After all, what difference did it make? Buick then believed that ohv was nothing more than a design feature that would make it easier to manufacture and repair his stationary engines. And when the patent was eventually issued, Buick knew that the rights would be assigned to his company. However, with some historical speculation, things get very interesting at this point.

If the patent for ohv had instead been issued in David Buick's name, and then not later reassigned by him to a Buick Motor Company controlled by Durant, then instead of dying in poverty, David Buick could have been wealthy beyond his wildest dreams. It may well have been Durant's concern with a possible legal challenge from Buick over the right to use ohv that caused him to have the Marr agreement worded in the manner that it was.

History sometimes works in strange ways. These events, coming as they did at a time when the automobile industry was so young, brought a new engine and a new automobile into the American marketplace. They also had a direct bearing on the formation and success of General Motors and are virtually without precedent.

To date, only one of the early (1899–1904) Buick stationary engines is known to exist. An ohv example built in Flint is now located at the Pioneer Village Museum in Minden, Nebraska. None of the L-head versions is known to have survived. Why only one engine has survived is not known. There is an historical refer-

ence to a large number of orders that were placed with Buick for engines to be built in Detroit before the company moved to Flint. Since stationary engines were made in both Detroit and Flint, it would seem only logical that they would have been made in some volume. Perhaps someday we will find another engine stored away somewhere. It would also be interesting to see an early engine built by the Buffalo Gasolene Engine Company.

Take a hard look at what is presented here and blow the cobwebs away from overhead valves for yourself. The time has finally come when the historians and scribes of automotive history can look at the Buick ohv engine in a new light. It was an engine David Buick was "very largely responsible for the creation of," it was patented by Eugene Richard, and it made use of a feature first used here and called the "valve-in-head" by Walter Marr. And in the final analysis, no matter who did what, on the day that first ohv engine sputtered to life, automotive history was changed forever. It was an engine that jump-started an empire.

Acknowledgments

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Special thanks to Marr granddaughter Mrs. Sarah Close and her husband, Bill, for sharing invaluable documents from Walter Marr's personal papers. Special thanks to early Buick historian Charles Hulse, who had the foresight in the 1930s to interview Walter Marr concerning his early work at Buick and who was willing to share priceless information.

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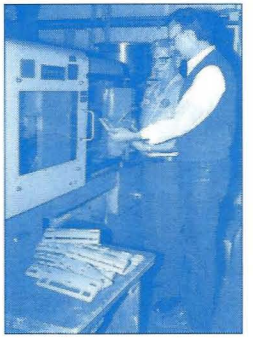

Dash elements are a specialty with us. Here, Dennis Carpenter examines '40 Ford Deluxe dash instrument panels. Panels are also available for Ford cars 1941/48 in which plastic was a prominent feature on the instrument panel. Colors and shapes are exact to original.

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