
Biography of WILLIAM LIKENS (BILL) BROWN IV

Modeler, Engine Manufacturer

Modeler since 1923 May 30, 1911 to January 8, 2003 AMA Number: 72439

Written & Submitted by ETT (8/96)

Posted by NR (8/96)

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Career:

- Created the first popular, successful production model airplane engine.
- His Brown, Jr. engine launched model aviation into the gas world.

Honors:

- 1974 – Model Aviation Hall of Fame
 - 1978 – National Free Flight Society Hall of Fame
 - 1982 and 1990– AMA Fellow Award
 - 1990 – Society of Antique Modelers Hall of Fame
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We Old Timers know what Bill Brown Junior did, but the story is different in many respects depending on which author we read. Some time ago, I finally convinced him that he owes it to the modeling fraternity to tell the story of his involvement with the development of the model airplane engine and dispel some of the myths about it. On September 22 and 23, 1994, I spent two days at his home-factory and talked to the man who has never written any articles for magazine publication, yet is a legend in his own time. I found out some of what this quiet-speaking man with a call from God has done for the men and boys of the world of model aviation. Here is his story. – Evan T. Towne

Mr. Model Engine – Bill Brown

By Evan T. Towne

Bill was born on May 30, 1911 to good solid upper middle class parents, as his father was a respected mechanical engineer. Bill had a brother and a sister. As the first son in the family, he became the fourth generation to have the name William Lykens Brown. (Later Bill's son became the fifth –but he is a bachelor!)

Bill's father (the third) made sure that Bill got a good understanding of mechanics. At the age of three, Bill's dad would show a picture of a locomotive or machine and point to a part. Bill would tell the audience what it was and sometimes what it would do. Bill's dad was a proud man, who provided for his family of five, plus his own mother, the good things of life. Naturally, he had an excellent wood shop and machine shop on the first floor. The fact that it was not in the basement tells how important it was to him. Even though he smoked a pipe, he told Bill never to smoke, and never to drink alcohol. Bill thought this good advice and took it.

In first grade, one of Bill's classmates had a rubber powered model airplane. Bill was fascinated. Later his dad bought him a book, *Model Flying Machines* by Morgan, 1913. Bill still has the book. At age seven, Bill tried to make his first model from the book. He used a broomstick for the body, and cardboard for the wings, of course it did not fly. Years later, he made another one from the same plan. This time it did fly. He and his neighborhood-flying buddy, Maxwell Bassett, built and flew many rubber-powered models, some that Maxwell had designed. Bill lived on 10th Street in Philadelphia and Maxwell lived on 11th Street.

When Bill was 12, he made his first model that really did fly – a Cecil Paoli twin boom pusher, from plans purchased from Ideal Model Aeroplanes and Supplies. In the 1920s, he said he worked all summer, building kites and selling them to the neighbor kids, so he could buy a three-foot Jenny for \$8 from Ideal. Later, he had a dream that his model had an authentic tiny working engine in it, just like the original Jenny. This started him thinking about a model airplane engine.

His dad had a twin cylinder outboard motor that fascinated Bill. He figured out how it worked, and eventually used it as a basis for his model engine. This is where he got the poppet valve intake idea. In 1926, he started drawing up sketches for his model engine. For several years, he kept thinking and drawing up his ideas.

When the Great Depression came along Bill's father lost his job, as did many others. He sold his vacation home and barely survived, compared to what he was used to. Somehow, he was able to keep his home and his machine shop. He had several small jobs, including selling railroad spikes.

In high school, Bill finally started fabricating parts for his engine while just “monkeying around.” When his dad saw him working on it he told Bill that he was just wasting his time and Bill should be studying instead. All the work on it was done in his dad's machine shop, including the spark plug, which was made just like big aircraft plugs, with a built-up mica insulator. The spring tension on the poppet valve was very critical, but he finally got it right.

When it was finally running and his dad found out about it, Bill said, “His exact words were a sarcastic ‘Now what does that prove?’” Bill did not realize what a strain his father was under, having been fired from his job through no fault of his own. Bill was deeply hurt at the time, but now he understands that whether he wanted to or not, he had taken some of the position of leadership away from his father, at least in this area. Bill said that as much as he loved and respected his dad, their relationship was never the same again. (This was around December of 1930.)

Bill carried the parts of his engine around in a brief case. One day in shop class, he showed it to some of the students, who asked him to run it, so he did. The instructor investigated the noise and was flabbergasted when Bill admitted to having built it. ***

*****Please note:** From Reed Martin: Mr Towne writes, ‘...The instructor investigated the noise [of Bill Brown starting his first engine in wood shop class]’ - and it should include - ‘...because he thought something had flown off the wood lathe. When he found out that it was Bill running a little gas engine for other students, Bill was thrown out of class.’

This is what Bill Brown told Joe Clements and me when we visited him in his shop many years ago. I asked Bill what grade he got for the year in shop. He said "B." THAT has to be one of the great ironies of Bill's life. In the same year he invents the lightweight model engine design he gets a "B" in shop class.

Maxwell Bassett was as innovative at designing models as Bill was in making engines. As soon as Bill had an engine ready, Maxwell had the plane designed and built for it. Fortunately, Bill had located an excellent supply of balsa planks and smaller scraps at one of the lumberyards. Bill and Maxwell took their new plane out on 10th Street and fired it up. It struggled into the air, but never got over four feet off the ground. Bill decided that it needed more power – and he already had some new ideas for the next engine. He started all over again, but this time he doubled the size and made the first Brown Model A. They put the new engine in the same plane and again took it to the street – this time it leaped off the ground, did a couple of loops, went over a house and landed in some bushes. Maxwell experimented and practiced all summer long and started getting better results with the model design.

On Bill's 20th birthday, Saturday May 30, 1931, the Philadelphia newspaper, The Evening Bulletin, ran a picture of Bill and his plane, with a close-up of the engine held in his hand. There was also a working drawing of "How to Build a Midget Gasoline Motor." The three-column story was titled, "Builds Tiny Motor Monkeying Around," and was written by his friend, Victor R. Fritz. Even though Bill's original engine had a built-up steel crankcase, an aluminum casting was offered to those interested in building the engine. Right next to the column was a scripture verse, "Whatsoever things are true.... honest, ... just, ...pure,... lovely ...of good report; if there be any virtue, and if there be any praise, think on these things" (Philippians 4:8). Bill took this as a go-ahead from God to develop his model engine.

Because of all the publicity Bill had gotten over his first small engine, his father decided to help Bill design his next engine. As Bill wanted more power, his dad designed the Brown Midget Motor to be a .451 cubic inch engine. During the summer of 1931, they built three in their shop, but none of them ran! Nine years later this design became the basis for the new small engine for Junior Motors Incorporated, (the Brownie model E). Bill learned a great deal in the process, as this was his first experience with formal machine design, ink tracings, blueprints, patterns, castings and further experience in machining. Plus, he was learning all this from his father. At school, they were drawing simple bushings, projections, and things. (Bill never thought to take his engine drawings to show his teacher.) Sixty-three years later these very tracings were unexpectedly returned to Bill by someone that had worked at Brown Junior Motors!

In 1932, the ruling authorities at the National Championships (Nats) had only one classification – powered models. In order to encourage contestants to be innovative, any power source could be used, but almost all contestants used rubber power. A very few used compressed air with limited results. Maxwell took their "gas model" to the Nats at Atlantic City and entered it. His model that he named Miss Philadelphia came in fourth. To some perceptive people this was the "end of innocence," as the gas model had arrived! To others, though, including the "rule makers," this was just a passing fancy that would create little further interest. The next year Bill and Maxwell both showed up at the New York's Roosevelt Field for the 1933 Nats with several different models and engines. They won first place in all three powered contests: stick model Mulvihill with a time of 14 minutes 55 seconds, Cabin model Stout with 22:22 and Moffett International with 28:18. There was one other gas model entered also, the K.G.

Charlie Grant, the editor of Model Airplane News (and a real model engine enthusiast) and Joe Kovel entered a big eight foot model, named for them, with a big aluminum engine. Grant designed the model and Kovel built it. Unfortunately, it was not finished until the day before the contest. On the day of the contest, they worked and worked to start the engine and only got a few coughs from it. Bill even went over and tried to get it going, but had no luck! Bill had hand made 12 engines by him and sold (for \$15 each). Charles Grant got the last one Bill made in his dad's machine shop. The judges finally woke up and made new rules for gas models.

The two Philadelphia boys got worldwide publicity. The model magazines wrote all kinds of stories, some with bad inaccuracies. People all over the world wanted to try gas models, which resulted in a ready market for model engines. Of course, he could not keep up with demand, so Bill's dad found an excellent machinist and innovator, Walter Hurlman, who ran a Tool and Die and Experimental machine shop. Bill said he was the best in the business! Together they made about 50 more Brown Model As (now called A-60 by the engine collectors).

Even though it was the middle of the Great Depression, and even if you did not have a job to go to, you could still make models. If you wanted an engine badly enough, there were a few available from Bill then others.

With so many people wanting engines, Bill's dad had been scraping the bottom of the barrel long enough. He swallowed his pride, took Bill's engine, (which now looked much better to him than before) and with a friend who knew some high finance people, convinced them to start a model engine company. As a qualified engineer, and by using his precision tools as a start at putting together the factory, he became president of the new company. His real ace-in-the-hole was, of course, Bill's wonderful engine design.

Getting in on the ground floor, and with worldwide publicity, they figured that they would become the biggest name in model engines. General Motors was a big name in autos, so they patterned their name after them. They chose Junior Motors as their name (Junior, meaning small, not Brown, Jr). Of course, the Brown name was magic now, so they added that to the engine crankcase (Brown Junior Motor, inside the outline of a propeller).

When Junior Motors was getting started, Bill recommended Walter to set up the assembly line. The vice president of the company was the son of a millionaire, who had big ideas about how it should be done. Bill's father was supposed to introduce Walter to him, but he had become sick, so Walter went to see him by himself. When he heard what was being planned Walter would have none of it, and left in a huff, so another engineer had to be found. Walter went back to his shop and made some more Browns that he called the Hurlman Aristocrat. (Ted Belcher has one that he says is a superbly made engine.)

The Brown Jr. engine was an immediate success, even at \$21.50. In the first two years of business, they sold 5,000 engines. The weakest part was the curved breaker point arm that lost its elasticity with use. Interestingly enough, Walter's was superior in quality. (Those in the know would put these points on the Brown for a winning combination.) During this time, Bill went to

Penn State College for three terms (until the money ran out). He was working on a Mechanical Engineering degree. He then came home and hired on as a machinist at Junior Motors. This job is all Bill got out of inventing the first widely accepted model airplane engine. Of course, it also got a good job for his father, which pleased Bill.

For several years, Junior Motors engines won most of the contests and were world acclaimed. Bill's father was "the establishment." After regular working hours, Bill was back in the shop "monkeying around." Bill reasoned that the large models being made were making it hard to get to a flying site. He realized that in order to start designing a smaller engine he first needed a much lighter coil and batteries. One day he asked the company purchasing agent to find a coil of the finest enameled wire he could get. Bill still has it (and I have a piece of it, too!).

When word got back to the "establishment," they did not like it! Bill was called into the office and he said that Mr. Roberts spoke to him as if he were a small child, scolding him for wanting to make a smaller engine. His father concurred; he did not want it either.

Here is the "Statement of Policy" given to him:

Decided upon at a meeting of Mr. William L. Brown, and Mr. Edward Roberts in the presence of William L. Brown, Jr. on September 25, 1936.

The Junior Motors Corporation at this time has decided to spend no further money in the development of a smaller motor than the present BROWN JUNIOR MOTOR for model airplane flying.

We feel that the present 1/5 h.p. BROWN JUNIOR MOTOR if adjusted properly can fly planes of a wing spread between 2-1/2 ft. to 15 ft. The reason the Company has decided not to make a smaller motor is because we feel that the present motor can be adjusted to fly such a small plane. Also, this same motor can cover the field of Radio Control. If there should be a larger or smaller motor, it would only reduce the number of sales of the present BROWN JUNIOR MOTOR.

Therefore, we feel that we want to bend all our efforts towards the development work of the Commercial size motor.

Nothing in the above should discourage any individual from development efforts working outside regular business hours.

(Bill added this comment: The Junior Motors Machinery, however, was now off limits for such development efforts.)

Therefore, the Policy of the Company is to train and inform the model builders that the BROWN JUNIOR MOTOR is capable of doing the work, which they require to enable them to carry out all their experiments in the model airplane line.

Soon after, Junior Motors put out a Newsletter, in an effort to get the word out. Here is what they said:

WHERE ARE WE GOING -BACKWARD OR FORWARD

A few boys have started the craze for small gas powered planes, which is fine. Most of these boys do not know enough about present-day motors and planes to be at the top of the list. It is known that you cannot make many mistakes in the design of a high-speed small plane, and this is where the boys decided to use less power to overcome their faults in design. At a low flying speed, the adjustments are not so critical, but if you double the speed there would be some affect to the performance (sic) which may have been over-looked before.

The present BROWN JUNIOR MOTOR is as light as you can get it without sacrificing power, easy starting, and durability. If you want to run the motor in a very small plane which requires less power all you have to do is close the Choke Nut almost all the way and then reduce the amount of fuel by screwing the Needle Valve down to get your motor running fast but smoothly. By doing this you reduce vibration and power which makes it suitable for flying a small light-weight plane.

Because he could not use the company equipment any more, he wanted to distance himself from Junior Motors, Bill and a friend, Jerry Smith, started riding a motorcycle 200 miles each way on weekends to State College, Penn. Bill liked the area where he had gone to college. He bought tools on the time payment plan, set up shop in a garage and built the Lykens Brown .12 engine. It was five times smaller than the Brown Jr .60. The fine wire made coils that were very light and could be powered by pen cells, instead of D cells. Even though he was ridiculed by his father and others that it would never work, he went ahead with it. He even put it on the big Brown Junior and ran it with the tiny coil and pen cells. The “establishment” would change nothing! He made Megow, the leading model kit manufacturer and mail-order firm, his sole distributor; thereby he did not have to advertise! They sold about 100 Lykens Brown engines. Jerry finally went back to Brooklyn, N.Y. and made the Smith engine that looked like a tiny Brown Junior.

When 1939 came and Junior Motors found other companies were passing them by, they finally decided to make a smaller engine. With Bill still in the doghouse, (even though he was still a machinist for the company) the job of designing the engine was given to Bill's dad, so he redesigned the Brown Midget to a .29. Bill still had reservations about it, but it was put into production. The engine was a big disappointment and Bill and his dad were both fired! Junior Motors struggled along for a while, but went down hill. This ended any serious work on internal combustion engines for Bill.

ADDENDUM: BILL BROWN – Mr. CO2

By Evan T. Towne

The use of carbonic acid gas, we now call it CO₂, is not a new idea. In 1890, a Frenchman by the name of M. deGraffigny was investigating its use as a power source. In 1906, Traian Vuia hopped his full sized CO₂ powered aircraft off the ground. This machine still exists in the collection of the Musee de l'Air near Paris, France.

In February 1943, during World War II, Mechanix Illustrated magazine ran an article about William Lykens Brown, IV, and his “model airplane motor no bigger than a thumbnail,” Bill's first CO₂ that ran. It shows him holding the tiny power plant, fastened directly to a CO₂ cartridge. All you Old Timers know that this is the Brown Junior that brought model airplane engines to the whole world, back during the Great Depression. It is the famous Brown Junior engine!!!

Bill says, “6336 N. 10th St. Philadelphia, Penn. was the address of my father's house where I grew up. He had a very fine workshop, which included woodworking and metal working tools. Without this shop I could never have built the model aircraft engines.”

September 1931, Model Airplane News ran a story on page 25 called “How to Make a CO₂ gas Engine Model.” The idea was to hook up six CO₂ sparklets to a two-cylinder air engine and run it for one hour and six minutes (calculated). One day in 1936 or 1937, Victor Fritz, a modeling buddy, remembered reading about it and brought a bunch of cartridges and a three-cylinder Hoosier Whirlwind, plus a hypodermic needle to Bill to check it out. The supposition was to solder the hypo to the airline of the engine then puncture the lead seal in the cartridge to power the engine.

It all sounded really good. The only problem was that the seal was not lead, but steel. When they attempted to puncture it, it just bent the needle. No problem, they were in Bill's dad's machine shop, so Bill just made a stronger “needle.” They then punctured the cartridge, and it started shooting around the room, bouncing off the walls. They were learning fast. The next time they locked a new one in a vise. This time the pressure went to the engine and Bill says that the pistons all started moving without waiting for their turn. This bent the connecting rods and cylinders all up, wrecking the engine!

Even while Bill was working for Brown Junior Motors, he was thinking small rather big. Bill was reprimanded by the “establishment” for asking the purchasing agent to get him a spool of fine enameled wire, with the object of making a tiny coil – the first step toward a new small engine. They said a smaller engine was not needed – just put a Brown Junior in a smaller plane, and throttle it down. When they did finally decide to make a smaller one (the Brownie .29) Bill was not around to engineer it properly, because he had been fired! (Too progressive?) As a result, the other engine companies soon put Brown Junior Motors out of business. (Bill did put out his own small engine, the Lykens Brown .12, about 100 of them and he did it on his own. They were sold through the Megow Company)

During 1940, Bill went with a friend to a Philadelphia armory, to see some small flying scale models. He asked the rubber-powered flyers if they would like to have a power source small

enough to replace their rubber bands. The positive response sent him to his drafting board. The first C02 with the calculated size of 1/8-inch bore and stroke (with a cubic inch displacement of only .0153) refused to run, but the second one did! More refinements coupled with a light steel tank, and Bill had the A-100. (One hundred has no dimensional meaning.)

On New Year's Day in 1942, while Bill was at State College, he designed and built in one day the smallest reciprocating engine in the world. This is the engine of which *Mechanix Illustrated*, in February 1943, ran an article and picture about Bill and his "Model Airplane motor no bigger than a thumb-nail." It shows him holding the tiny power plant, fastened directly to a C02 cartridge. This was the beginning of his latest model interest.

Early in 1946, Bill and his father had developed the "Brown C02 Engine Mark 1." On April 26, 1946, William Brown III and IV applied for a patent for the Brown C02 Engine, Mark 1. They had a local company make a batch with seven fins and "Brown C02 Engine" stamped around the front of the crankcase. It was too big for them, so the rights were sold to O.K. Herkimer (the Herkimer Tool & Model Works, or OK ENGINES), who added a fin and modified the crankcase and cartridge holder for mass-production. He progressed through three different models.

In 1947, Bill became an instructor in Drexel Institute of Technology and set up Campus Industries. He saw a couple of problems that he wanted to help solve:

1. How to pay for your education, and
2. How to get some practical experience in addition to education.

Bill had been thinking about his little C02, (that could be built on a jeweler's lathe) and suggested that as Campus Industries' first project. Investors took his new proto type A-100 to a flying field and they all watched as engine and model flew out of sight, never to be seen again. Campus Industries was incorporated and many A-100's were made and sold, starting at \$12.50 in three different models. There was a larger one called Campus Bee, and the Buz, which was made for another company.

Concerning the C02, he said, "It was my father who did most of the work of dealing with the patent attorney. We both signed the patent as the inventors. He took all the engines larger than 3/16 inch bore and made the deal with Herkimer Tool and Model Works, Herkimer NY. I took all the engines smaller than 3/16 inch bore and helped establish Campus Industries, whose first product was the A-100. The Ludlow Street address is where Campus Industries moved to be near to the Drexel Institute. Some of the workers hired were students."

He adds, "In 1950 I moved from Philadelphia with my wife and three boys, to Pine Grove Mills, Penn. near Penn State University. My intention was to open a branch of Campus Industries near Penn State. The main office was to remain in Philadelphia. They moved to Adams Avenue on the other side of town and farmed out the A-100 to the G&F Co. We thought they could do a good job, since they were manufacturers of watchmakers' tools. They thought they could, too. Meanwhile, the Adams plant continued with the Bee engines. However, G&F made some 'minor' changes on the A-100, including zinc crankcase which was easier to cast but three times

the weight, the crankshaft 1-72 thread which doubled the weight of that part and stainless steel burnished pistons, which did not seal as well as the hardened tool steel lapped pistons. This ultimately resulted in the end of the A-100 production. By itself, the Adams plant was not profitable enough to stay in business and had to quit. There were no more Brown C02 engines until 1969.”

Reorganized under different ownership, Campus Industries added new projects. Finally, Bill elected to buy out the model side of the business and form his own company to manufacture his own creations. He renamed the new company Brown Junior Motors, Inc., bringing back a very famous name to the world's modelers!

In 1969, he came out with the first of a new generation of C02's. He called it the Brown .005 (.005 cubic inch displacement). It was the same size as the Campus Bee, but it had a very light spun aluminum tank that could be re-filled from a cartridge loader. It sold for \$524.95 and required a load and launch gun for \$5.95. It was a difficult engine to make and he could not keep up with demand for them. The magnesium crankcase was difficult to clean up and it was hard to get a good piston fit with a blind bore. He made only about 1,000, 500 of them with lapped steel pistons, and 500 with "Nylatron" plastic pistons. (Nylon contained a lubricant called Aluminum Disulfide. This made them black and they sealed well, but they also added more friction, Bill said.)

After he had developed the light-weight spun aluminum tank, he took one and added a length of copper tubing to a nozzle with a tiny hole about one-hundredth of an inch in diameter, and made a true reaction jet. He called it the Micro-Jet. It sold for only \$2.95. The cartridge launcher for \$5.95 could also be used with the .005 engine. Both of these came in waxed sandwich bags.

His zoning board has given Bill much trouble and will not let him add new buildings to make manufacturing easier. Nonetheless, he has redesigned and updated his engines and added others to his line, working in rather limited facilities.

In 1973, Bill came out with the MJ 140 twin and MJ 70, which was the updated .005, but not as hard to make. He also went to metrics for size. (MJ stands for “Metric Junior” – cubic millimeters.) The old Campus A-100 was the next to receive a redesign. When he finished with it, it weighed less, but produced twice the power. He called it the A-23 and it weighed only one fourth of an ounce.

His early engines had four exhaust holes and did not have serial numbers. Starting with the .005, serial numbers were used and only three exhaust holes. The first generation engines came in boxes; the second came in clear zip-lock bags. The filler nozzles were first 1.5 mm in size, then the international size, 2 mm. Also sometime after bringing out the Ansul adapter, Bill got word that some Ansul dealers were refusing to sell cartridges for purposes other than fire extinguishers, so he discontinued them.

Sometimes he started selling engines before he had printed instructions for that particular engine,

but all instructions were about alike anyway. He also told me that he had actually received money for the A-23 before the first one was finished and tested. I do not care to get into semantics, but my use of the word "engine" comes from the definition: any power source that is derived from the piston being forced down or by internal combustion is called an engine.

Bill has just finished the tooling for the tiny GB-12. (The name stands for Gasparin Brown.) Bill gave me a beautiful cut away that I have mounted on my display paddle. As of July 1994, Bill was selling Brown Junior B-100, B-200, A-23, GB-12, and the GB-24.

Bibliography:

An Article in Feb. 1943 issue of Mechanix Illustrated
Several articles by Bill Hannon in Model Builder 1986-7
Information sheets and personal contacts with Bill Brown
Article by Peter Chinn in May 1992 Aero Modeler

For what shall it profit a man, if he shall gain the whole world, and lose his own soul?

The Story behind the CB-12 and GB-24

By Evan T. Towne

It all started when Bill was convinced that he no longer was the manufacturer of the world's smallest reciprocating engine. So, he wrote this letter to Mr Stefan Gasparin of Czechoslovakia.

Dear Mr. Gasparin:

June 22, 1989

Congratulations to the new Champ. It has been proven to me that you have built the World's smallest aircraft engine. Bob Peck, Walt Mooney, and Bill Hannan are my special friends, although they live on the other side of the U.S.A. I would like to be your friend also, at even a greater distance. We all share the love of tiny airplanes, and precision machinery.

I made a CO2 engine in 1942. It had 1/8 inch bore and 1/8 stroke. Now I make the A-23 engine with about 3mm bore and stroke. It is hard for me to grasp that for more than 45 years it was believed that I had built the smallest aircraft engine. You are the first challenger.

I am pleased to send you an A-23 engine, and soda charger as a gift. You can experiment with it as you like. It would be interesting to see a photograph of the two engines side by side.

I wish you good fortune in your work, and enclosed are some other items, which may be of interest.

Yours sincerely,

Bill Brown

Bill then received this letter from Mr Gasparin:

Dear Mr. Brown,

5.8.1989. (Aug.5, 1989)

Thank you for your letter. I respect it very much. Many thanks for your photos and an article about your work and family. I have found it interesting. Now I know about your work and opinions much more.

I have been admiring you for a long time, I much respect you. When in 1973 I saw your photo of your engines / articles by Howard Mc Entee / for the first time, I was fascinated. As I had not information on your motor. I began to build a similar one. My beginnings were poor, however I have gradually achieved success encouraging me in my work and thus I have wholly devoted myself to the construction of CO2 mini motors for a period of 15 years. I express gratitude for the pleasure during the construction to you.

I have never been your rival. On the contrary, I am assured of the fact that it is only you who can produce the smallest motors and in this way multiply your beautiful life successes.

Thank you very much for your present, the A-23 motor which I received. The motor operates fantastically and it is a nice example of simplicity and a perfect function. Each detail is perfectly sophisticated and produced in the simplest way. A .03mm piston grinding is marvelous. I sincerely congratulate on you. I will always respect your A-23.

On the other hand your A-23, (New one? Author!), is a challenge. If its production is perfectly prepared then I suppose that the problems to be solved with a minor cca 6cmm motor /02,5x 1,2mm / will not be an insurmountable obstacle.

I am sorry; however, I have not the possibility of sending a similar article about myself. I am a 5-year-old engineer of electrical engineering. My wife is a magistress of pharmacy, we have a son - Michael who is 22. He has been studying physics in Prague. When he is at leisure time, he makes the photos for me either.

I am sending a few photos to you as a greeting.

I would be pleased to exchange opinions and experiences between you and me.

*With best regards
Yours faithfully,
Stefan Gasparin*

From Towne

Bill sent me these two letters "for my file" then he further gave me this information.

"I was invited to spend my 80th birthday (May 30, 1991) in Spitzerberg, Austria where C02 flyers have their international contest. It turned out that I was able to be there where I met Stefan Gasparin.

He invited me and my wife to visit at his home in Czechoslovakia where we stayed with him and his wife Vera. Across the differences in languages, they made us feel welcome. We stayed for several days.

I had a number of small crankcase castings with me. We used these as a start in the design of a new small engine. It was not an attempt to build a new world's smallest engine, but to make a practical engine "the next size smaller" than the A-23. (Author's Note: Bill said that Stefan had given him 1,000 prop screws, and also taps and dies marked M 1.2)

Sometime after returning to the U.S.A., I received a drawing from him. Its scale was 20 times size, and it defined the structure, and dimensions of the engine we had been designing. The bore of 2.5 mm and stroke of 2.4 mm set the displacement at 12 cubic millimeters.

He asked why not call it the Brown Gasparin? I said it is easier to say GB This meeting is now a happy memory of international friendship. My job then was to translate this drawing into production tools and finally engines for sale. It took longer than I would have liked, but now the first of the GB-1 2's are beginning to materialize.

My life's ambition at this time in my career is to find people who want to become members of Brown Junior Motors Inc. It would be great if we could collect people and ideas that would expand this art form and carry it beyond where I can take it."

On June 13, 1994, I received a surprise package from Brown Jr. Motors, Inc. It contained a GB-24 twin, with serial number PT 3 (Proto-type # 3) in a 4"X4" Zip-lock bag, with no instructions. There was also a letter from Bill, explaining that this (one of three Protos) was given to me for writing up the story of the C02. I was flabbergasted! He also invited my wife and me to visit with them!

I had been telling him that he owed it to posterity, to get the correct Brown Junior story told. He agreed to that, but he also wanted me to tell as many modelers as I can about the Brown Junior Park. That information is below the line.

I am very happy to say that now all the information in this package has been approved by none other than Bill Brown, himself! I have also been in contact with Ted Brebeck of OK Engines, who has corrected the OK C02 story.

GOOD C02'ing

Evan Towne /94

Below are Towne's additions and corrections to Bill Brown's story

Editor's Footnote:

Dear C02'ers,

Dec. 16, 1994

September 22 & 23, 1994 my wife and I spent two delightful days at Bill's home in Pine Grove Mills. I taped an interview with him with the idea of getting the true story of Bill's modeling activities without all the inaccuracies found in many magazine articles. I am in the process of writing the story "Mr. Model Engine – Bill Brown," that starts at the beginning. It covers the Brown Junior and Lykens Brown engines, too!

My C02 documentation is now as complete as I can get it. I started out at 8 pages of information and 30 pictures. By adding much new information, it is now 11 pages. I have also had to add several pictures to bring it up to muster.

"Bill and Dorothy, his lovely wife of 57 years, are parents of three boys: Bill the fifth, a journalist for Nabisco in New York, Richard, owner of a canoe paddle factory and David, who works full time for Bill in the office – mailing, correspondence, and purchasing.

When Bill moved to Pine Grove Mills, he bought a plot with a World War II Army quonset hut on it. There were actually three situated in the one area. His family lived in the one they call Q-1 for 10 years. They added living quarter's front and back, but it was still small for a family of three growing boys. Then they bought Q-2. Bill bought some tools and made a workshop, even though at that time he was working for the Penn State University, "machinist first class."

In 1965, Bill re-activated Campus Industries at Penn State College, with the name changed to Micro-Tol. After some disagreements with the other officers of the company, Bill elected to buy out the model side of the business, and form his own company to manufacture his own creations. He renamed the new company Brown Junior Motors, Inc., bringing back a very famous name to the world's modelers!

He moved the company back home, with the idea of getting back into the C02 engine business. He dug a basement under Q-1 and got more tools, as he had perfected the design for his new Brown .005. It was the same size as the old Campus Bee. They bought and moved into Q-3, which was very small and very crowded, and turned Q-1 and Q-2 into small factories and started producing the excellent .005. On a whim one day he took the new light weight spun aluminum tank, that he had designed for the .005, added a length of tubing and a modified filler nozzle with a tiny hole about a hundredth of an inch, and made a true jet he called a "Micro Jet" and started selling both of them. He soon needed more space.

With things going well, now a spacious new building would make it possible to produce more engines and actually make some money, as he had plenty of orders for them. They started the foundation and had it almost done when the Planning Commission for their area set up some very

restrictive home occupation rules, which effectively blocked the new workshop. The foundation stood like a skeleton for 20 years as Bill made-do and even brought out new models in his pinched quarters.

The engines Bill designed were the single and twin MJ 70, and MJ 140 (The same size cylinder as his .005, but this time 70 cubic mm. MJ stands for “Metric Junior”), the New Bee and the new Bee Twin, updated A-100 called A-23 (which weighed less, but put out twice the power as the A-100), B-100 and B-200 (single and twin) and, in 1994, the incredible GB-12 and GB-24. (Single and twin, GB stands for Gasparin Brown, a design effort with Stefan Gasparin, from Czechoslovakia.) The A-23, B-100 and B-200, GB-12 and B-24, are still in production and can be purchased.

Besides Bill and Dave, there is one other full time employee, Kevin Harpster, a very dedicated young man that Bill relies heavily upon to run production, assembly, and testing. He has worked there for 16 years. Because of lack of expansion, Bill says that Brown Junior Motors has never been a financial success. He wonders what will happen to it when he, as tool and die man, plus production worker, can no longer continue. This worries him!

Finally, because Dorothy was a teacher, they could afford to build (not a factory) a house on the foundation. They have lived in the new house for the last nine years. Bill is still frustrated by not having a proper factory to produce his stream of ideas. He is almost 86-years-old, but he is now considering selling his home and buying a factory with some space to expand. If he could produce engines in large enough quantities, he sees the possibility of actually making some money, instead of just “getting by.”

He has never had a problem of selling what he makes. He has never even advertised because he can barely keep up with demands as it is. There are several outlets that are anxious to sell his whole line of engines. He even has more ideas he would like to develop. When I spent two days at his home/factory, he told me about an improved Micro-jet that you could load with CO₂, adjust, put on the ground, and after a couple of seconds it would take off and streak skywards. I thought that was too complicated for such a small thing, but he explained it to me and it made sense! He has not had time to make one yet, but it is all in his head, well thought out.

The powered model airplane hobby that flourishes all over the world owes a debt of gratitude to Bill, first for the ignition engine, and now for his jewel-like tiny CO₂ power plants. Europe has a real passion for CO₂ powered flight, and I see that it is beginning to create an interest here in the U.S. I think perhaps with the ecological problems that are so pressing these days, maybe CO₂ might be a way of keeping model building and flying alive for future generations.

Write Bill Brown at

Brown Junior Motors Inc.
P.O. Box 77
Pine Grove Mills, PA 16868”

Letter from biography author

*John Worth, Assistant Historian
4326 Andes Dr.
Fairfax, VA. 22030*

Dear Mr. Worth,

Aug. 1, 1996

Bill Brown wrote me a letter and told me to fill out your AMA History Program form. He said that he thought that you would be glad to talk to me. I have written the above biography of Bill Brown's life and I have been hoping that Model Aviation will be printing it soon. (I submitted it several months ago but I have not heard any favorable comments.) I hope that when Bill was there in Muncie last month, that he dispelled any reluctance to have it printed. I have filled out the form for my autobiography to the best of my ability and hope that you will find it of value. I hope that it is not too long!

*(signed) Evan T. Towne
591 Buchanan St.
Huntington IN 46750 Age 71 - (DOB: April 21, 1925)*