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# The AMA History Project Presents: Biography of CHARLES HAMPSON GRANT

November 20, 1894 to January 15, 1987

Started modeling in 1908

AMA #122

Compiled, Transcribed & Edited by SS (01/2003), Updated by JS (12/2005, 08/2009, 10/2010, 04/2017, 11/2017)

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*Video link: One of the National Model Aviation Museum's special Fly By report, Biplane Bomber, is on YouTube [here](#).*



**“In this episode of Fly By, Claire discusses a model produced by the Ritchie-Wertz company and designed by Charles Hampson Grant around the turn of the 20th century.**

**“PLAN #60601 available at <http://bit.ly/AMAPlans>.**

**“Related Blog Post: <http://bit.ly/BiPlaneBlog>.”**

**- Published on YouTube on January 27, 2017 by the National Model Aviation Museum.**

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## **Career:**

- Built his first full-sized glider in 1910 in which he flew 60 feet
- Studied civil engineering at Princeton University from 1913 to 1918; became a flight student at Princeton Flying School in 1917
- Received a Military Aviator Brevet from the French government in recognition of his design of a pursuit plane sometime around the very early 1920s
- NACA stole his design of a multiple segment wing flap in the mid-1930s
- Organized the first large-scale production system for flying model aircraft in 1919
- Designed, built and used the first model propeller-carving machine around 1919; the machine turned out 1,000 propellers a day
- Established simple rules of model airplane design between 1919 and 1921 that ensured models would fly without long testing and changing
- Started the Boys' Model Plane Camp in Vermont in 1921
- Served as editor of *Model Airplane News (MAN)* magazine from 1931 to 1943; increased circulation from 21,000 to 300,000 during that time

- Wrote and published more than 300 articles on the design of model aircraft while serving as the editor of MAN
- Published his first book in 1941
- Gave his first lecture to Princeton students and faculty on aerodynamics in 1917
- One of four men assigned to design the Gordon Bennett Racer of 1920
- In 1927 became the consulting design and production engineer for the Kingsbury Toy Company
- Developed “The Grant Law of Spiral Stability,” which made pilotless aircraft stable in all conditions of flight
- Gave various lectures and did radio shows to promote model aviation education
- Formed the International Gas Model Airplane Association (IGMAA) in 1933 and became its director. (The IGMAA later merged into NAA, which had a junior program that eventually became the Academy of Model Aeronautics.)
- Member of the Early Birds of Aviation and honorary engineering officer of the Civil Air Squadron
- Has many times been called the Father of Model Aeronautics in America

#### **Honors:**

- 1964: AMA Fellow
- 1969: Model Aviation Hall of Fame
- 1979: National Free Flight Society Hall of Fame
- 1990: Society of Antique Modelers Hall of Fame
- 1996: Kits and Plans Antiquitous Hall of Fame

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*The following information about Charles H. Grant is an excerpt; written by Charles himself in part of a letter to Willis C. Brown dated May 27, 1965.*

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My aviation activities began in 1908 when I attended an aviation show in New York. Soon after that, I tried to build models that would fly, from plans. However, this first one “never left the ground.” So I tried my hand at designing and building my own. The second one actually flew about 65 feet.

From that time on most of my spare moments were devoted to aviation – first models, then wings attached to my bike, which left the ground momentarily, but only to throw me into a ditch and “etch” my hide with designs of Vermont gravel.

In 1910, I built a 30-pound, 48-square-foot glider, which carried me safely for 60 feet from my house roof in gliding flight into our meadow.

The next year, 1911, I built a 25-foot span, 210-square-foot, 90-pound glider in which I made many flights over the following five years. To this in 1912 were added ailerons and skids, to improve control and safety after minor crackups.

I was studying civil engineering at Princeton from 1913 to 1918. During this time, I became a flight student at Princeton Flying School (1917). But after some flight training I took my pilot physical exam and was debarred because of middle ear trouble as a result of measles.

So then, I served as maintenance man and mechanic there. Also, I designed a pursuit plane and submitted it to the U.S. government at Washington. They considered it but, as one member of the board told me later, I should not have expected my designs to have been accepted because only those who had facilities and “direct contact” with government officials had a chance of having their work accepted.

However, later I received a Military Aviator Brevet from the French government in recognition of my efforts. (It seems that even Wright had to go to France to have his work recognized.) And then later there was Billy Mitchell. So, at least I have been in good company. Later when I went to NACA with my multiple segment wing flap in 1935, it was the same story. They not only told me it was not helpful or practical, but they in 1938 and 1941 put out reports showing test data on the exact designs which I had sent to them in 1936. These they called the NACA Double Segment Flap. They gave me no recognition then or since, even though I brought these circumstances to their attention. Obviously now I have no respect for them, because only “little men” act like this. They certainly are not objective scientific thinkers.

The Martin Company used a later form of my flap on their 202 and 404 aircraft and finally I was able to get a royalty contract, but only after legal pressure through patents, which I held.

My model activities followed from 1908 continuously on an experiment and contest-flying basis until I enlisted in the Army. Here, later, I was sent to the School of Military Aviation at MIT in Cambridge, Massachusetts, and from which I graduated in July 1918. Then I was sent to the technical section of the Air Service at Washington, later at McCook Field in Dayton, Ohio.

After separation in 1919, I stayed in Dayton and organized what seems to be the first large-scale production system for flying model aircraft. And, believe me, they really flew even though the wings were milled out of solid balsa sheets to have a perfect and efficient wing section.

Besides designing the models, I designed the production machines and the system. Here we turned out more than 100,000 planes in two years, all selling for \$1 or more. The average was \$3.50.

It was here that I designed, built, and used the first model propeller-carving machine, with which one man could turn out 1,000 propellers per day. They then were put in a rotating sand barrel and finished smooth.

Here, also, I spent two years of constant experiment to establish simple rules of design so the models would fly perfectly, right off the drawing board, without long testing and changing. From this work, the stabilizer and fin area rule was evolved by me in 1919 and used on all our tractor models. Then and only then could we be sure of consistent flights.

Several years later, when I lived in New Rochelle, New York, I met Carl Goldberg who lived there, too, and I gave him this data. He changed his models to conform these rules and immediately he began to win contests, usually held at the White Plains Community Center Building.

We operated in Dayton during 1919, 1920 and part of 1921. I gave up there because the men who financed the operation failed to conform to my contract in respect to royalties on my patents and designs. Then I came back east to New Rochelle (1921) and started my Boys Model Plane Camp in Vermont.

This gave me time for more experiments. This data I correlated and published in article form in *Model Airplane News* magazine (*MAN*) while I was editor, 1931 to 1943. Later I put these articles in book form, which was published in 1941.

During this time, also, my experimenting took me into the field of high lift devices. I tested nearly every kind used now and finally came out with my multiple segment slotted flap.

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*Art Schroeder wrote the short narrative below.*

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## **Charles Hampson Grant**

**1932-1943**

by Art Schroeder

You will find a beautifully done bio on Mr. Grant in the May, 1987 issue (*Model Airplane News*???) and I could add very little. I met Charlie Grant at one of the New England Nationals (was it Westover?). He spoke for two hours at a special seminar at the event. This was one of the most impressive human beings I have ever known. His life was one of achievement in a variety of fields. I still remember one of his comments at the seminar, "I was frightened this day as I flew down from Vermont. This was because the stabilizer on this airplane was in the worst possible location - on the top of the fin!" To this day, I cannot get on an airliner without thinking of him. I do not know whether he was right - he sure sounded "right!"

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*The following was published in Model Aviation magazine, in the January 1980 issue.*

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He's known as "Charlie" to his friends and he's a legend in his own time. Now in his 90s, Charlie is as spirited as ever, still speaking his mind with authority – just as he used to in the thirties when he was editor of *Model Airplane News*. Always outspoken, Charles Hampson Grant was never one to play politics or curry favors. He says what he thinks and his thinking is of the old school – proud of his heritage and the part model aviation has played in it.

A founding father of the Academy of Model Aeronautics, Charlie is also a brilliant engineer who had much to do with the development of flaps, slats, and other high lift devices used on modeler jetliners. He's an expert on stability and control in regard to aeronautics and his articles and books of the past laid the foundation for model aircraft design theories, which are still being used today.

Living in his beloved New England for many years, Grant has been out of the limelight since World War II. But, as suits his character, he has stayed busy thinking about writing. One result of his efforts is his new book – available from AMA – entitled “Gateway to Aero-Science.” The book bridges between present day thinking and model aviation up to the forties. It's full of the basics of aircraft design and theory of flight; a subject many current modelers are unfamiliar with, in these days of ready-to-fly instant success.

Other than his books, Charlie hasn't said much in public in the past 30 years. But recently, upon the honor of being inducted into the National Free Flight Society's Hall of Fame (at the 1979 National Model Airplane Championships), he put some words on paper, looking back with a view toward the future. Those words are published here for the benefit of all who were not able to be present at the Nats.

“To have you understand the importance of this message to the present operations of the Academy and possibly the whole world of model plane activity, let me take you back to 1931, at least in your mind if you younger modelers cannot remember those days.

“The Great Depression was in full stride. Jobs were scarce, people were losing their last dollar, and some even took the final step of jumping out a window. Nearly everyone was looking for something to believe in and to carry out successfully.

“A small group of men of which I was a member believed they had an answer to this vital problem. It was something through which young men could express themselves without restraint and get an honest answer in return. It was the tremendous educational medium of designing, building, and “test” flying model aircraft. These planes flew in the manner expected, if designed and built accurately, and if not, they told you in no uncertain terms where you were wrong, usually with shattered planes representing many hours of thought and labor. At least “nature” told you the truth and gave you a firm basis for trying again to achieve success.

“This group of men were old time successful model builders, manufacturers, and experts in various fields of endeavor. So they got going without delay organizing clubs with a magazine as house organ, and contests to develop interest and enthusiasm among these frustrated youth of that era.

“This idea spread like wild fire with the timely development of gas models: a brand-new discovery for integrating research and experiment which became the envy of every full scale airplane development operation. With this new instrument, our youth outstripped the unimaginative older generation and got honest answers for themselves.

“Consequently, the model activity expanded with leaps and bounds. Some older modelers developed one new successful engine after another in rapid succession. New designs of planes with perfect stability became numerous, with some flights of 100 miles or more, like the Old KG and Bassett’s later models; these due to solution of the spiral stability problem.

“This rapid development filled the years from 1932 to 1942 with great excitement and valuable contributions by our young people, to aeronautic industry and science: and this was done through the basic educational effect of this great activity.

“Possibly the greatest effect outside of the modelers themselves became evident in the full scale plane industry. It was well known that the “big boys” used to “snitch” all their new ideas and innovations from model plane magazines when they thought no one was looking. This became a standard joke among modelers.

“As an example, let me tell you a true story of an incident that was representative of standard procedure among the full-scale aviation “big wigs.”

“I was sitting in my office one day in 1938 or ’39, while I was editor of the foremost model plane magazine of that period, when a friend from one of the commercial photo agencies came in to sell me some plane photos. As he stood in the doorway, he said, “Hi, Grant, where do you think I saw your magazine?” “Why, it might be anywhere,” I replied, “it is read by people all over the world.” “Well, it was not far from here,” he said, “just a couple of blocks away, in Rockefeller Center. The President of Curtiss-Wright Company called on the phone and asked me to bring some important brochure photos to his office. Well, as I opened his office door and walked in, he was sitting at his desk absorbed in reading a magazine held up in front of his face.

“When he finally saw me standing there, he, with obvious embarrassment, quickly stuffed the magazine under his desk and arose with haste to greet me – but not before I saw the name “Model Airplane” on the cover.

“What are the ‘big shots’ trying to do,” my friend asked, “get some new ideas for their old, out-of-date planes?”

“That was only of many such incidents indicating that many modelers knew more than the full-scale engineers and executives. As a matter of fact, many modelers by that time had become designers, engineers, and executives of numerous full-scale plane companies.

“The degree to which model plane activity had developed by 1942-43 is indicated also by the number of participants in the Nationals. In 1932, there were about 45 contestants, whereas in 1942 as Chicago (I believe) there were 1,600. So many gas models were in the air at the same time that they were cracking up in mid-air collisions. It resembled a real battle action.

“Now, what was the result of all these 10 years of training and activity? After careful investigation, I found as an editor and knowing true circulation figures, that at least one million

young men had been thoroughly trained in every branch of basic aeronautics, particularly in engine design and aerodynamics. Many who preferred action became pilots.

“Most of these men (and boys) served in the second World War, and without doubt provided the means to win it after our fleet was destroyed at Pearl Harbor. What a wonderful achievement for these young men who got an aeronautical education with “toy airplanes” as one of our “back woods” senators in Washington referred to “model aircraft.”

“Where are these boys of the “thirties” now? Many of them are still here. We are those boys or their sons and daughters. Many of us are old or approaching old age – basking in the glory of our greatly deserved achievements. But, are we with our waning spirits not overlooking our responsibilities as respected leaders? As such, is it not our duty to pass on our wealth of knowledge and experience to our sons and daughters so they also may enjoy and enrich themselves by carrying on and perpetuating these scientific and educational advances, achieved at such great cost in effort and sacrifice? Should they not have the opportunity to participate in and enjoy this great, pleasurable, education and scientifically valuable activity? Should not they also have the opportunity to carry on the baton of development to a better life? We went to the moon- maybe they will go even further.”

Charles Hampson Grant was inducted into the [Model Aviation] Hall of Fame in 1969, and is an AMA Fellow. He was a famous model flier and designer before many current modelers were born.

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*The following was published in The History of the Academy Of Model Aeronautics... from the Beginning to the Year 1966, by Willis C. Brown and Dick Black.*

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“Charles Hampson Grant, (Editor, *Model Airplane News*.) - Quoted with permission from 1936 Model Aircraft Yearbook.

Born November 20, 1894. Great Grandfather John Hampson designed and supervised building of De Witt Clinton, first engine to pull passenger train on New York Central Railroad ... Grandfather, Edward P. Hampson, Steam expert. Equipped Edison shop at Menlo Park, N.J. Supplied lighting machinery for Statue of Liberty. Getting down to Charles: Caught chronic air-fever while attending first aviation show in New York in 1908. Bought blueprints for model airplane, which he constructed of whitewood. Did not fly. Next contraption was 28 inches long, wooden frame covered with tissue paper. Steamed hardwood prop. Flew 50 feet. In 1909, built single stick pusher. Came within 10 feet of 431-foot world record, held by Percy Pierce ... Constructed pair of wings for his bicycle. Ten-foot span covered with straw matting. Bike went up and Charles came down – hard! Octave Chanute inspired next creation, which was 13-foot monoplane glider. Carried Charles safely from long sloping roof of his house into adjacent hay field below. Decided to build a real glider. Worked on it six months. Was 25-foot biplane. Made first flights in summer of 1911. Cracked. Repaired and added higher lift section. Made about 300 flights during summer of 1912, attaining maximum altitude of 30 feet. Graduated from Steven’s School in 1913 and entered civil engineering school at Princeton University. Left

college for a year and secured job with Grover Loening as bench mechanic at Sturtevant Aircraft Company in Jamaica Plain, Massachusetts. Received staggering sum of \$8 per week. Worked from 7 to 5, with Sunday off to encourage spiritual development. Four months later resigned for job in repair shop at Roosevelt Field. Reentered college in January 1917 to complete last half of Junior year. War. Two rich old Princeton grads donated three Curtiss JN trainers for Princeton would-be war pilots. Became Vice President of Princeton Aviation Club. Took flying physical examination but was turned down. Ear trouble. Left Princeton in senior year and enlisted as private in aviation section of Signal Corps, U.S. Army, in December 1917. Assigned to 84<sup>th</sup> Squadron at Kelly Field, Texas. After three months, duty was transferred to school of military aeronautics at Massachusetts Institute of Technology. Graduated as Cadet in 1918. Was commissioned as second Lieutenant and assigned to the Technical Section of the Air Service, Washington DC. Department was moved to Dayton, Ohio in 1918...Worked on design of new pursuit plane...War ended shortly afterwards. Was honorably discharged in 1919. Prior to discharge built and flew some interesting models. Was approached by Dayton businessmen with offer to put them into production. Developed a system, which flooded middle West with planes that would fly from 100 to 2000 feet. Greatest problem was producing propellers. In three days, Charles designed and built first machine to manufacture propellers in large quantity. One man and helper could now produce 1000 propellers per day. Company failed in 1921 due to poor business conditions. Mr. Grant returned east and organized the Duncan Camp of Boy Building. Directed this successfully for seven years until Mrs. Grant's illness forced abandonment. At this time, he perfected an exceedingly practical and foolproof plane. The Grant Aircraft Company was organized in 1928 for the purpose of manufacturing this model. Could not supply them fast enough and leased right to manufacturer to Kingsbury Manufacturing Company of Keene, NH. Entered their employ as consulting engineer. During two years...over 200,000 aluminum models of six designs were made. Models were sold as the "Kingsbury Silver Arrow." Depression of 1929 ruined toy industry...Was asked to become Editor of *Model Airplane News*, which post he accepted in December 1932. Looked upon his editorship as merely temporary, but four years have passed and is still serving readers of that publication. One of his most important accomplishments in the compilation of model design data collected over a period of seventeen years into article form. These articles...in *Model Airplane News* will soon appear in book form. Personal statistics: Likes good cigars and plenty of them. Used to have a good old reliable Ford Model A roadster, which delivered him to all model meets. Has recently gone modern and was spotted in a new Chevrolet Convertible. Designed the "KG" gas model, which has met with tremendous success in all parts of the world. Based design on sound principles of stability and aeronautical efficiency. Has most charming wife. Commutes to New York from Connecticut. Dynamite when aroused. Floored spectator at IGMAA meet when latter chased and threatened a contestant. We forget the count. Grant is now retired and lives in Vermont. Has been called by many "The Father of Model Aviation." His book, *Model Airplane Design and Theory of Flight*, was effective stimulant to encourage youth to design their own models. Holds several patents, licensed the multi segment wing flap used on Martin 404. States that Boeing 707 uses version of same. Has innovating ideas on a "safe" plane, would land at about 35 mph. One of biggest contributions was the war he waged on the Junior Birdman organization plan to stop gas model flying as dangerous. Charlie, the IGMAA, and *Model Airplane News* fixed that and gas model flying came into its own."

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*The following photographs are from the Joe Kovel collection at the National Model Aviation Museum.*

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*(Photo on left) 1909: C. H. Grant, at age 15, with his eighth successful experimental airplane model. It flew 1300 feet in Peru, VT. Photo taken by Grant's mother, Gertrude H. Grant. (Source: #0019 Joseph Kovel Collection, National Model Aviation Museum Archives)*

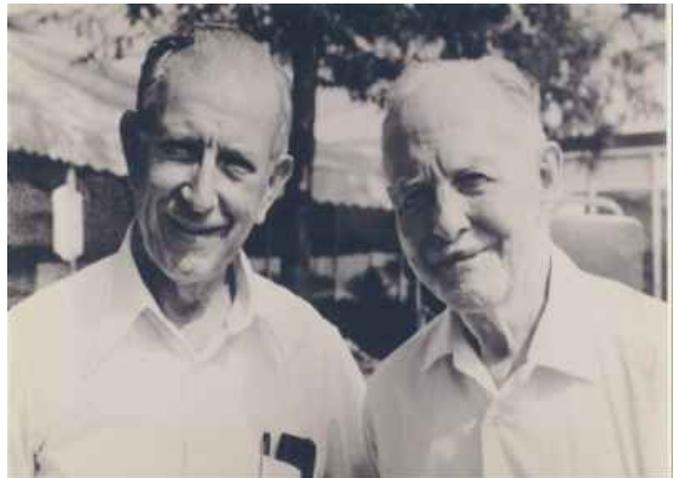
*(Photo on right) September 1933: The full KG team after the first test flight of the KG-1. Joe (left) built the model, Bill Brown (middle) designed and built the Brown Junior engine used in the model, and Charles Hampson Grand (right) designed the model. Otto Conderman took this photograph in Landgrove, Vermont, close to where Charles lived in Peru, Vermont.*



*(Photo on left) 1934: Grant watches as Joe Kovel completes the assembly of the original KG-1 prototype in preparation for a flight during the summer at a contest held at the LTA Station in Lakehurst, New Jersey.*



*(Photo on left)  
Grant (right) with the KG-1.*



*(Photo on right) 1983: Joe Kovel and  
Grant at the Nats held at Westover Air  
Force Base in Chicopee,  
Massachusetts.*



*(Photo on left) Grant with a full-  
scale airplane.*

*(Photo on right) The KG-1 at the National Model Aviation Museum, Muncie, Indiana. Designed by: Grant, Built by: Joe Kovel, First Flight: Labor Day weekend, 1933, Restoration: Started in 1976, Completed in 1985, Engine: Brown Jr., Serial # B626. [Note: The above data is shown on the fin and on the underside of the right wing.]*



*(Photo on left) The KG-1 hanging in the AMA's headquarters building in Reston, Virginia.*

*(Photo on right) January 12, 2000: Joe Kovel with the ready-to-be-covered replica KG-1 he was building for the Cradle of Aviation Museum at Mitchell Field in Long Island, New York. This photograph was taken at the museum's visitor center.*



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