
Biography of CHARLES HAMPSON GRANT

Began modeling in 1908 November 20, 1894 to 1987 AMA Number: 122

Compiled, Transcribed & Edited by SS (1/03), Updated by JS (12/05)

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; became its director
- The IGMAA later merged into NAA becoming the Academy and eventually the Academy of Model Aeronautics division, making Grant a founder of the AMA
- 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

The following information about Charles H. Grant was written by Charles himself in part of a letter to Willis C. Brown dated May 27, 1965. This is only an excerpt. For the entire letter, please see the Charles Hampson Grant file in the National Model Aviation Museum Archives. The AMA librarian can provide assistance.

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.

The following information ran in a promotion for Charles' book "The Aero-Science of Free Flight." The pamphlet included a synopsis of the book along with this biography of Charles. It was published in 1983.

The aeronautical career of Charles Hampson Grant started in 1907 when, at the age of 13 years, he was inspired by the model plane activities of the New York Aero Club (later the Aero-Science Club) to build his first airplane model.

This first attempt was crude and did not fly more than several feet before crashing. However, during the next three years, he designed, built and tested increasingly successful models of every type imaginable.

These included first paper gliders, then stick pushers, tractors and even delta-wing planes with rubber-driven pusher propellers that flew better than planes with normal wings.

Then in 1910 he extended the information gained through model testing into the design of a small full-scale glider.

Many successful flights were made with this little plane and with a large bi-plane glider of 210-square-feet of wing area during the years of to World War I – 1917. The latter carried the young pilot on flights up to 400 feet at maximum altitude of 25 feet above ground level.

During this period, intense supplemental model plane testing was carried out particularly to determine airfoil and plane stability characteristics, even during his engineering course studies at Princeton University where in 1917 he gave the first lecture to students and faculty on aerodynamics.

Also, while at Princeton he designed and made detail drawing of a 148 mph pursuit plane with a retractable landing gear to increase speed to about 168 mph – a record at that time. It was sent to the War Production Board at Washington, D.C.

For this he was awarded a Brevet D'Militaire Aviateur by the French government. This design was submitted to the Curtiss Airplane Company at Buffalo and used later (1920 to 1930) as a prototype for design of the

Curtiss Racing planes. (See “The Speed Seekers” by Thomas Gordon Foxworth, pages 230 to 233, for more detail.)

In 1918, after enlistment as a private in the Air Section, Signal Corps, he graduated as second lieutenant from the U.S. School of Military Aeronautics at the Massachusetts Institute of Technology. He was then sent to the design section of the Aviation Division, U.S. Army, at Washington, D.C., and later at Dayton, Ohio (McCook Field).

Upon separation from the Army in 1919, he became a member of a group of four men assigned to design the Gordon Bennett Racer of 1920. This included Howard Rinehart (test pilot and advisor), Milton Bauman (chief engineer), Orville Wright (consultant) and Charles Hampson Grant (consultant and designer of new ideas and developments). (For more information, see “A Stranger in Their Midst” by Thomas Gordon Foxworth, pages 161 to 168.)

He was responsible for the design and development of the Wing Flaps (leading and trailing edge flaps), the cantilever all wood veneer wing and the retractable landing gear, of which his landing gear of 1917 was the prototype. The wing flaps and the wing itself were the first “flaps” and wood veneer cantilever wing used on an airplane – 1919.

In that year, also, he dedicated his life to the aviation education of the public and flight safety. His first effort in this behalf was the creation of the flaps for the Gordon Bennett Racer; to slow down the landing speed. Secondly, he established the manufacture of ready-to-fly model planes on a mass production basis that nay novice could fly successfully. This required two years of continuous experimenting to accomplish. It was required also that Mr. Grant design all tools, jigs and the whole production system. After this was done he had to sell them personally by demonstration. Huge sales resulted, because no other plane on the market could make such flights. More than \$200,000 worth was sold in one year.

Third, he started a boys’ camp in Peru, Vermont, as a model plane camp. Here he trained boys in basic aviation where upon the parents also became involved.

Fourth, in 1927 he started model plane mass production in Vermont, but soon after moved to Keene, New Hampshire. Here he became consulting design and production engineer for the Kingsbury Toy Company. Two hundred thousand planes, totaling \$300,000 were turned out in one year after starting. Then the Great Depression hit and stopped all sales.

Fifth, in December 1931 he became model Airplane News magazine (MAN) editor, starting with 21,000 circulation. In six months this was doubled and after 11-1/2 years, MAN had 300,000 readers.

During those years Mr. Grant wrote and published more than 300 articles on the design of “pilotless” or model aircraft. This resulted in the basic training of more than one million young men in basic aeronautics and aircraft design. These, in turn, converted thousands of parents to travel by airplane and thus to extend production of commercial aircraft.

This extension of the model plane and full-scale industries took place largely as a result of the development of inherently stable gas model plane design, made possible, in turn, by Grant’s discovery and development of what he called “The Grant Law of Spiral Stability,” which prescribes the design of an airplane required to insure inherent spiral stability in an aircraft without control by a pilot, human or mechanical.

Applications of this law made pilotless aircraft completely stable in all conditions of flight. It solved the problem of spiral stability of glide-bombs developed at Wright-Patterson Air Force Base during World War II, through the specifications prescribed by Mr. Grant personally for Colonel Nyman of the New Weapons Development Section.

Sixth, while editor of MAN he further carried out his purpose of public education by lectures at New York University to teachers of aviation in schools, by radio talks on WOR, as well as that of aircraft safety by his invention of the Multiple Segment Wing-Flap in 1934. He was granted six patents on this type of wing flap.

The flap used on many airliners and Air Force planes today (1983) have the same basic configuration of his 1937 type of flap. The Martin 202 and 404 transports used one design of this flap under patent license.

Seventh, in 1943 he filed patents on a delta-wing design he had developed over a period of more than 18 years.

All of these developments came as a result of his research with model planes over the years from 1907. In 1946 he designed and flew a gas engine-powered delta-wing prototype plane successfully on five successive flights. This was the first delta-wing aircraft of record to fly successfully, i.e., perfect take-off, air support in flight with power and landing without damage. These were “tethered” flights to prevent damage during testing, with fixed controls as part of the test procedure.

In 1932 his development of the first completely inherently stable gas model led to a boom in gas model plane building and to the formation, by him, of the International Gas Model Airplane Association (IGMAA) in 1933 of which he became director. This grew rapidly to a membership of 6,000 hard-core expert designers that formed the backbone of all model plane activities.

In 1937, through the initiative and efforts of Mr. Grant, the IGMAA membership was turned over to the National Aeronautic Association to form the Elite Group of their previously organized Junior Division. Because of their superior knowledge of model plane art, this group was given the name of the “Academy.” This later absorbed the whole Junior Division, which then continued under the name of the Academy of Model Aeronautics, as it is today – 1983.

Thus, this author (Charles Hampson Grant) became one of the founding fathers of the Academy of Model Aeronautics of which is a Fellow member. In recent years Mr. Grant has served as consultant to numerous aviation organizations and has been extremely active in developing new “High Lift” and other devices.

His is a member of the National Aeronautic Association, the Model Aviation Hall of Fame, the Early Birds of Aviation, and honorary engineering officer of the Civil Air Service Squadron and member of Air Service Post #501, American Legion.

In 1974 he was awarded the American Legion Medal of Merit for Pioneer Development of the Airplane Wing Flap by Post #501.

Mr. Grant has been referred to publicly on numerous occasions as the Father of Model Aeronautics in America.

The short narrative was written by Art Schroeder.

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 can't get on an airliner without thinking of him. I do not know whether he was right - he sure sounded "right!"”

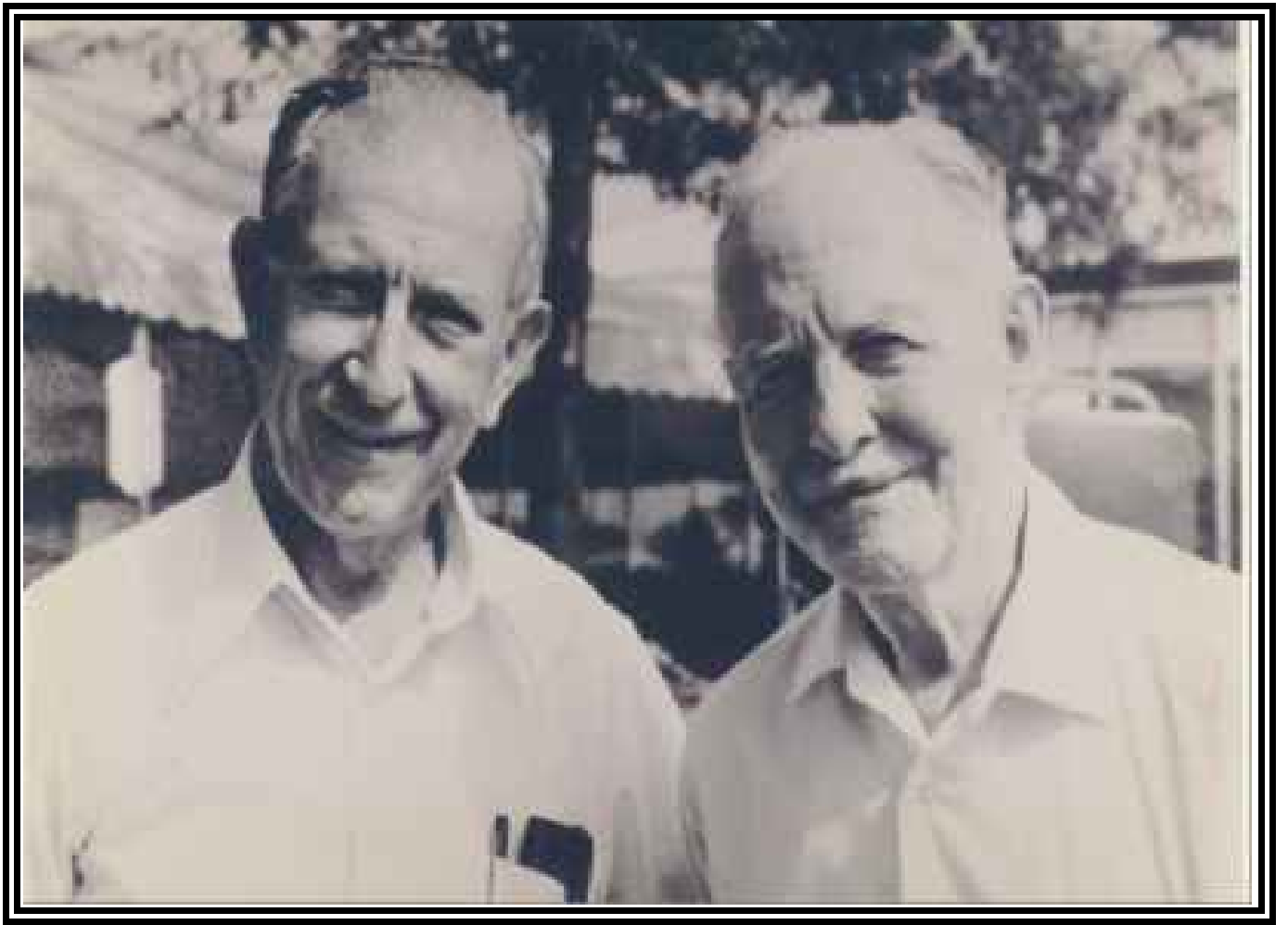
For further information on Charles Hampson Grant, including letters, articles and some of his personal writings, please see his file in the National Model Aviation Museum Archives. See the AMA librarian for assistance.

Charles Hampton Grant

Photo Album

From the photo collection of Joe Koval - AMA 2556













Designed by: Charles Hampton Grant

Built by: Joseph Kovel

First Flight: Labor day weekend, 1933

**Restoration: Started in 1976,
Completed in 1985**

Engine: Brown Jr. - - Ser # B 626

Note: The above Data is shown on the Fin and on the underside of the right wing.





