



The AMA History Project Presents: Biography of CHARLES A. "SLIM" ARENS



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Controls, Unlimited By Nicholas N. Plasterer

Most remote controls for aircraft come from the small Chicago factory of "Slim" Arens, a shy engineer who got his start in aviation building model airplanes.

THREE decades ago a tall, gangling youth of 14 began dabbling with model airplanes when off duty from his work in a railroad office. Today he is president of a Chicago airplane controls factory. Though his plant is not large, Charles A. Arens plays an important role in modern aviation. Equipment manufactured by Arens Controls, Inc., is used in all types of aircraft.

If you have looked at an instrument panel, undoubtedly you have seen one or more Arens remote controls. If you are a pilot, chances are you have operated several of them. The patented Arens control solves the problem of push-pull manipulations "around a bend," from propeller diving brake lock to dump valve of the fuel system; from fire emergency valve to landing light. The 10 types of Arens controls - all of them approved by the CAA - are adaptable to dozens of other uses.

Airplane builders have found "going around a bend" a major problem in installing controls. Various obstructions may be in direct line between the dashboard and the part to be operated. For example, the oil or gas tank may lie directly between the carburetor and the dashboard control for throttle or mixture. Arens controls make it a simple manner to skirt around such obstructions. Although several other companies are making similar controls, Arens produces the largest share of them and he also has the biggest assortment. Before Charlie Arens came along there were two ways of going around a bend. One was a series of rods and bell-cranks, or jointed devices, at each turn of direction. There was at least some play at the joints and they needed servicing. The other method was the use of two cables for making adjustments in the two directions. Both of these methods require more room than is used by the Arens control. It is almost impossible to use any control other than the Arens type in some installations because of lack of space.

The principle of the Arens controls is simple. The rigid type has a brass tube enclosing the flexible mechanism which connects the knob on the instrument panel with the unit to be operated. The connection is a spring or coiled wire for the push or compression load, encircling a cable for the pull or tension load. The control can be used with the various dash units (plain, locking and vernier) and resembles the choke on an automobile dashboard. The all-flexible type control has the spring and cable operating inside a flat wire coiled, fabric-braided casing, which

is treated to resist gasoline, oil and water. A third type is a combination of the rigid and all-flexible models. The all-flexible, rigid and combination controls are used for throttle, mixture, spark, cabin air, oil cooler, carburetor air, flap position indicator, landing position indicator and propeller adjustment.

Arens products also include the vernier-type control which may be used in conjunction with a rigid, all-flexible or combination model. With this control, coarse adjustment is made by pushing and pulling the knob and fine adjustment by turning the knob. It is useful when fine adjustments of the throttle, mixture, carburetor air or propeller are to be made. Another Arens item is the rotating push-pull unit, with which any degree of rotation up to or more than 360° can be obtained. It is a new Arens development and its present use is limited to adjustable propeller valves. The device converts the push-pull movement to a rotary movement. A tightly coiled spring is attached to both ends of the sliding member, a loop of the spring encircles the pulley, holding the pulley and sliding member in position.

One of the firm's featured products is a locking device used in aircraft and other fields. By means of a steel ball and a hardened wedge, the controls can be locked in any position. Among the controls which often employ the lock unit are those for the carburetor air scoop, oil cooler, cabin air control and parking brake.

Many aircraft manufacturers use Arens controls as standard equipment. The Howard Aircraft Corporation installs seven of the controls on its planes; for throttle, propeller, wobble pump, parking brake, mixture, cabin ventilator and carburetor air. Conflicts abroad and defense measures at home have resulted in a substantially increased demand for Arens controls. Lockheed is Arens' largest customer; the hundreds of Lockheed Hudsons being used by Britain's Royal Air Force carry Arens controls. Martins, Grumman and Brewsters exported for war service have Arens' controls. A large number of controls used in ground and aerial warfare are produced by Arens Controls, Ltd., at Croydon, England. This affiliated firm was licensed 10 years ago to manufacture them.

Many of the military aircraft bought by the U. S. Government are equipped with Arens controls.

The adaptability of Arens controls to aviation is shown in a listing of 40 different applications in which they have been used on military and Naval aircraft alone. The controls are used for the master switch, starter switch, mixture, throttle, spark, carburetor preheater and carburetor air scoop. They are also employed to operate the regulator and vent cut-off and the dump valve of the fuel system. If a pilot wants to flatten the propeller pitch to develop full horsepower for take-off, an Arens control will do the trick. After altitude has been gained, the control will enable him to steepen the pitch, so that the prop takes a bigger bite, lightening the load on the engine.

On an Army reconnaissance flight it probably is an Arens control that operates the camera door. The bomb safety and bomb release of a bomber also are manipulated by one of Charlie Arens' devices. The controls figure in the comfort of the pilot and his crew, one of the models being used for the heating and ventilating system. Communications may depend upon an Arens unit used for the radio receiver band. When the plane returns to the airport the landing light may be

operated by an Arens control. Before the pilot leaves his ship he will set the parking brake - also one of Arens' products.

Other military and Naval uses of Arens controls operate propeller diving brake lock, throw-out control, throttle unit, engine control shutter, flap control, supercharger, wobble pump, instrument by-pass valve, pilot-seat locking device, cockpit heater, de-icer, engine cowl flap, fire emergency valve, release cable for pressure fire extinguisher, gyro-pilot, stabilizer incidence indicator, oil shut-off valve, hot air intake, flap position indicator, battery cutout switch, oil radiator control, landing gear indicator, auxiliary tank pump control of the oil system and oil cooler shutter. In addition to aircraft and marine controls, the Arens firm now is furnishing equipment for other fields. One of its recent assignments was the production of controls for Admiral Byrd's Antarctic Snow Cruiser. The longest remote control necessary for this huge vehicle measured 60 feet.

Arens says: "We are working on some new ideas which we believe will be of advantage to the aircraft industry. Our business in the past was chiefly with the aircraft manufacturers and airlines, but we are now branching out and are furnishing controls for various other uses such as air conditioning, automotive, marine and industrial." Marine controls include throttle, mixture and spark units for everything from small outboards to crash boats. Arens provides furnace and ventilator controls for air conditioning. The flexible control, with or without the locking device, also is used in air conditioning. Throttle controls also are found on a number of commercial and fire trucks.

Behind this scientific development in the Chicago factory is the same enthusiasm for aviation that Arens showed in his model airplane days. Informal, he works in office or back shop with his coat off, shirt sleeves rolled up. Back in the plant when his employees greet him, it is either "Charlie" or "Slim" (he stands 6 ft. 3½ in.). His workers are loyal and have high respect for him, but are not expected to hold him in awe.

Arens is a native of Chicago where he attended grammar school. He was working for the Rock Island Railroad as office boy and later as a clerk when he started to build model planes in 1911. In 1912, when he was 16, he became one of the Illinois Model Air Club's first members. He flew his models at the famous old Cicero flying field. The air club was founded by William Stout who later designed the Ford-Stout trimotor monoplane and who now heads the Stout Engineering Company of Dearborn, Mich. Arens incidentally, built controls for the throttle spark and mixture on the Stout all-metal planes. At the Cicero field he also helped the pilots and mechanics. More important, he had the opportunity of helping Matty Laird build the first Laird airplane. Laird took Arens and the late George "Buck" Weaver with him as mechanics on his first exhibition flight in 1915.

The exhibition flight was made at a county fair at Alliance, [Ohio]. The plane was crated at Chicago and shipped to Alliance where it was reassembled for the show. Laird's finances were so low that his two mechanics had to pay their own railroad fare. However, he was able to reimburse them. The fair paid Laird \$300 or \$400 for the two flights he made. Each consisted of a short trip over the city and several circles over the fairgrounds several times. Weaver later founded the Weaver Aircraft Company. Laird now heads the E. M. Laird Airplane Company of

Chicago.

His appetite for aviation increasingly whetted by his association with Laird and other pilots, young Charlie started to build a small biplane in the fall of 1915, using a three-cylinder Anzani engine. Finishing it in 1916, the 20-year-old builder took his plane to Ashburn field. Matty Laird tested the ship and Charlie hopped it that fall. It was the only plane he has ever owned. Accordingly he became a member of the Early Birds by soloing before December 17, 1916.

Charlie never had held a pilot's license nor did he make another flight as pilot after that lone trip in his own plane. But he still holds Aircraft and Engine Mechanic License No. 240, issued July 14, 1927. In the spring of 1917, just before the United States declared war, he sold his plane for \$400 to Horace Keane who used it as a solo ship in a private airplane school on Long Island. Before Keane bought the plane it was flown by Marjorie Stinson, Bert Acosta and Laird. By the time Charlie had hopped his plane he was unable to retain interest in his railroad office job.

"There was no alternative," he laughs. "I was eating, sleeping and dreaming aviation and I don't imagine I was worth much in the railroad office. So in December, 1916, I quit my job and went to Long Island where I had a chance to be a mechanic with the L. W. F. Engineering Company. Later I also served as inspector.

"As a mechanic I worked on assembly in the experimental department and also did considerable field work, set up planes and rode as a mechanic on test hops. I helped build the first Liberty-motored plane. The first few Libertys had eight cylinders but they soon switched to 12-cylinder engines. These biplanes were built as observation planes for the Army. The Army furnished the engines and we built the planes. I also worked and flew as mechanic on the L. W. F. Owl, also built for the United States Government. It used three 12-cylinder Liberty engines and was the largest plane the Government had at that time."

During his 7½ years with the L. W. F. plant, Arens developed his inventive ability. He worked on many special jobs, one of which was a motor test stand. He was asked to install a throttle control on the stand. That was the actual start of Arens Controls, Inc. His first control consisted of a steel casing bent to the required shape with a spring for compression encircling a cable for tension - the same principle used in controls now produced in the Arens factory. Returning to Chicago, he worked for Matty Laird as mechanic. In 1926 he became a mechanic for the newly established Chicago-Minneapolis air mail line, owned by the late Charles Dickinson, "father of aviation in Illinois." Arens was employed by the airline only a few months when Dickinson sold out to Northwest Airlines.

Meanwhile, Arens continued to produce his controls in a basement shop at home, filling many small orders. Finally he devoted full time to production. One of the planes he equipped with controls during this period was Billy Brock's Stinson which he flew most of the way around the world in 1928. Brock, accompanied by Ed Schlee, flew from New York to Tokyo via London and Paris, traveling from Tokyo to the United States by boat. Brock's plane was equipped with Arens controls for the throttle and mixture.

With the demand for his controls growing Arens in 1929 licensed the Wilson Steel & Wire Company of Chicago to build the controls on a five-year contract, the inventor to serve as manager of the department. At the expiration of the contract in 1934 Arens opened his own plant. From three or four employees in 1934 his staff increased to nine by July 1939, when the firm was incorporated under Illinois statute as Arens Controls, Inc. In October the concern moved to larger quarters and more equipment and machinery were bought. Thirty employees now are working for the firm.

The present plant has about 6,500 square feet of floor space, but Arens is planning to expand. The factory is located on the sixth floor of a factory building at 2253 S. Halsted St. In other floors of the building several small factories produce a variety of products, including medical supplies, metal beds and bed springs, dresses, cotton felt and furniture. Before the first of the year Arens plans to take over the entire sixth floor. This will give the plant a total floor space of 10,000 square feet. Since the office will remain unchanged and there will be but slight enlargement of the stock room, the change will double the plant's actual production space.

Orders are pouring in from all sections of the United States and there are also several Canadian accounts. The Arens factory now has a backlog of more than 7,000 controls. Under present production the plant is able to turn out from several hundred to 1,000 controls a week according to the type. Four years ago Charlie Arens had \$28 in the bank; today the company has an authorized capital of \$50,000. For the first quarter of this year gross business was over \$18,000. Comparative gross incomes for the past five years show the factory's steady progress. In 1935 the gross was about \$10,000; 1936, \$14,000; 1937, \$25,000; 1938, \$25,000; 1939, \$42,000. Gross for 1940 will total approximately \$80,000.

Arens is not only president and treasurer, but also chief engineer. Lack of technical education has been no handicap. His is the knowledge derived from years of experience, bolstered by keen powers of observation. Ingenuity and practicability have been combined to produce his inventions. An idea for a new development comes to him and he works out its general principles in his mind. Then he experiments until he is satisfied with the results. Explaining his bachelor status, Arens says: "I've never had time to get married. I doubt if any wife would stand for me spending so much time at the shop."

A new member joined the firm when it was incorporated last year. He is Calhoun Norton, vice president and secretary. He has relieved Arens of much of the responsibility of operation, giving the latter more time to push expansion of the plant and work out new development. President Arens and Vice President Norton make an excellent team. Aged 44 and 25, respectively, they typify the youth of aviation.

Norton was born in Chicago where he received his grammar school education. After graduating from Culver Military Academy, Culver, Ind., he studied aeronautics at the Rensselaer Polytechnic Institute at Troy, N. Y. It was at Troy in 1937 that Norton learned to fly. The following year he bought a Ranger Fairchild which he keeps at Ashburn field, Chicago. He joined Arens at the suggestion of his father, R. H. Norton, president of the wealthy Acme Steel Company. The elder Norton, P. W. Grassell and M. W. Van Arsdale are directors of Arens

Controls, Inc. Grassell is president and Van Arsdale vice president of the Wilson Steel and Wire Company, Chicago, The house of Arens is looking forward.

Developments and improvements are constantly being carried on in the plant. As aviation continues its scientific progress, Charlie Arens and his corps of workers will contribute their share to progress in the production of reliable and effective controls.

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