ELBRIDGE

ENGINES

—*to begin with*

THIS little booklet is intended to serve the dual purpose of recording the first successful flights made by novices in America and to point out some of the reasons why there were not more of them. If it says a great deal about Elbridge Engines, the fact should not be attributed to an entire lack of modesty nor to undue aggressiveness; they are mentioned frequently because without Elbridge Engines there would have been practically no amateur flights made in America during the past year.

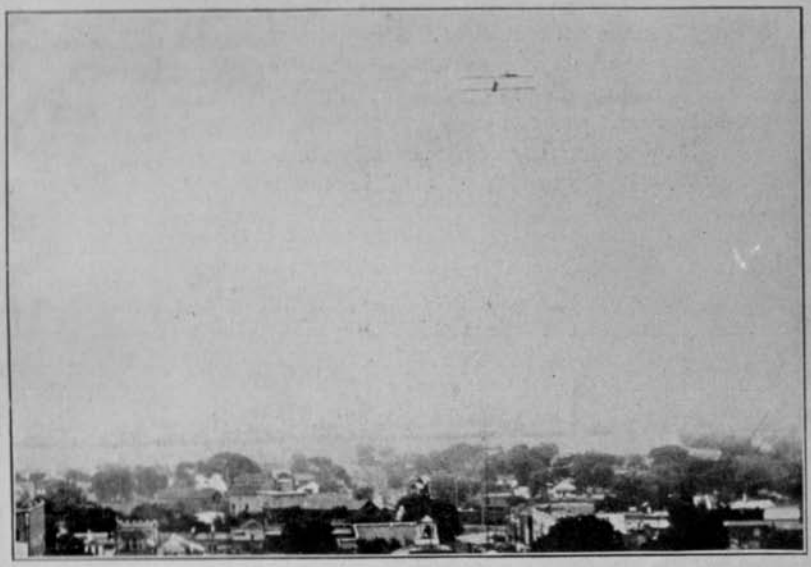
It is impossible to write about amateur aviation in America without referring to the exploits of Mr. Clifford B. Harmon. He is the leading amateur of America, and probably of the world, interpreting the word "amateur" in the technical sense. The word "amateur" is used in this booklet, however, as referring more to men flying machines built in the main by themselves, without professional assistance of any kind, and who also have taught themselves the art of flying as well as relying on themselves for the care and up-keep of their aeroplanes and motors.

A year ago such amateur aviation was a thing of the future. Then, if an amateur machine left the ground for a matter of a few feet the successful aviator was awarded a silver cup and his exploit recorded in columns of newspaper print. Even among professionals, a one-mile flight was regarded as a wonderful accomplishment. Today, if a novice flies less than a mile at his first attempt, no public attention is paid to the fact. But such a flight is really just about as difficult and haz-

Clifford B. Harmon at the Belmont Meet

ardous now as it was a year ago. Nothing new of any especial note has been developed in the design of aeroplanes, and except that far greater care is now observed in details of construction, the only advantage possessed by the experimenters of 1910 over those of 1909 was that they were able to secure more reliable engines.

As the power for weight engine has been the chief factor in the development of aviation, it may not be out of place at this time to indicate the position of engine manufacturers in this country a year ago. At that time there were exactly as many

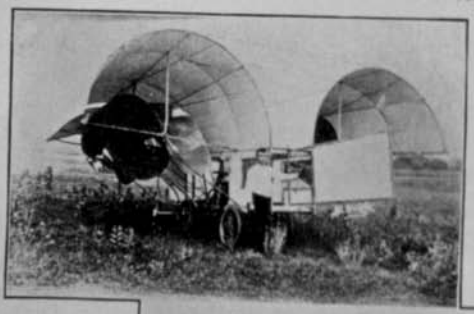


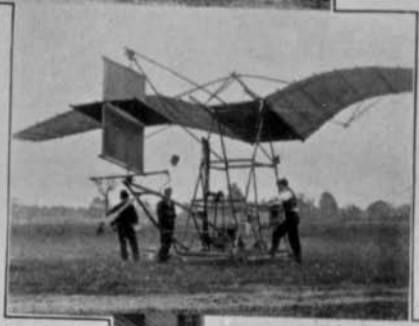
William Evans flying over city of Kendale, Kansas

aviators as there existed very light engines. In other words, there were plenty of would-be aviators but light and reliable motor power, as a market commodity, did not exist. As a matter of fact, we were regarded, among other engine manufacturers in general, as fit subjects for the lunatic asylum, when, in 1908, we began to advertise and to base our selling arguments on the phrase "more power for weight than any other engines in the world."

About July, 1909, we began to receive inquiries regarding our product, from men who confessed, after much correspondence, that they wanted engines for flying machines. We were trying to

convince an obdurate motor-boating public that economical speed demanded horse power of least possible weight, which seemed to us a simple proposition, while here were other men who not only wanted engines to drive them skimming over the water, but, as well, over the landscape in general. Finally, one Frederick P. Schneider of the New York Aeronautical Society, visited our factory and inspected our product. He weighed the engines, saw them in operation, told us we had a bonanza; and so thoroughly interested us that we agreed to further tempt fate (and the laughers), by modifying one of our marine engines to meet what were then considered the requirements of an aviation engine. About the same time, Lindsay, of Chicago, and John Seiler, of New Jersey, filed orders with us for similar engines. We believe these to have been about the first bonafide orders given in this country for special engines for aviation work, or to be more exact, for installation in aeroplanes.



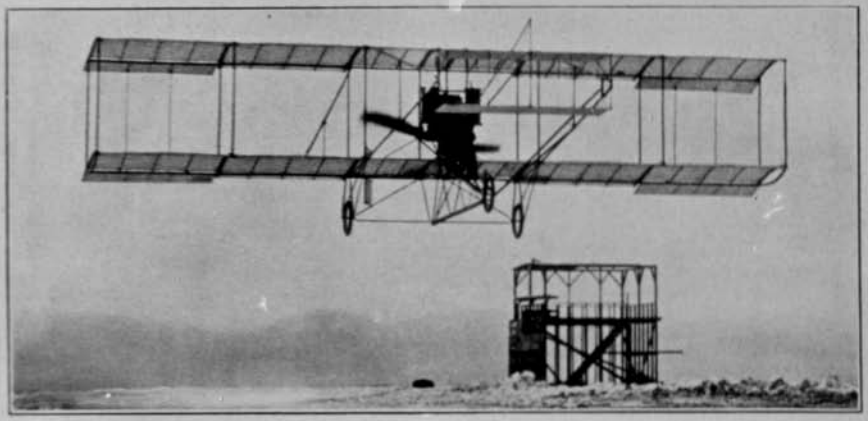


Some Experimental Types

None of these engines ever flew more than a few feet, but they served the purpose of showing us what were the essentials in aviation engines, and as the (for our part) unsolicited demand

increased, we turned our attention to the de ıt of an engine particularly suited to aviation. It cost . of money for experimental work—there were engines on the ırket retailing complete for about what we were compelled to pay wholesale for so small an item as a light welded steel manifold; and the light crank case castings, connecting rods, etc., that went into our scrap pile cost more than our original plant—but in January, 1910, we had an engine delivering more than 40 b. h. p. at a stripped weight of 167 lbs. not only that, but an engine so simple and so strong it could safely be sent into the hands of inexperienced men in far parts of the country.

It was the beginning of popular experiment in aviation in



Mathewson Biplane flying at Denver, Colo.

America. Feverish as the rush to California for gold in 1849, men called for power to install in miraculous flying machines of every description. Surely the scarcity at that time of light and powerful engines supports the Biblical assertion, that the wind is tempered to the shorn lamb, for if engines had been plentiful and all of the sadly constructed contraptions in this country had been provided with power to leave the ground, the history of amateur aviation during 1910 would have consisted largely of obituary notices. The ideas expressed in many of the machines were theoretically sound, but the details of construction, in the majority of cases, showed sad lack of mechanical knowledge; or else, the builders were in such a hurry to get into the air that they neglected the work.

The number of men who really completed machines and attempted to fly in them during 1909, was very limited. Among the membership of the New York Aeronautical Society, Dr. Wm. Greene, Fred P. Schneider and Raiche, made the most ambitious attempts. They completed their individual machines, and, equipping them with miscellaneous automobile and marine motors, made some short flights. Mr. Raiche, if the writer's memory serves, won the cup for the first flight. Dr. Greene, in November, 1909, was the first member to successfully carry passengers in his machine, which was also one of the first to start from wheels. W. R. Kimball, also of the Aeronautical Society, bought the Dr. Greene machine and made some flights at Rahway, N. J. A number of other machines were constructed at the Morris Park track and in different parts of the country, but so far as the records show none of them was ever known to leave the ground.

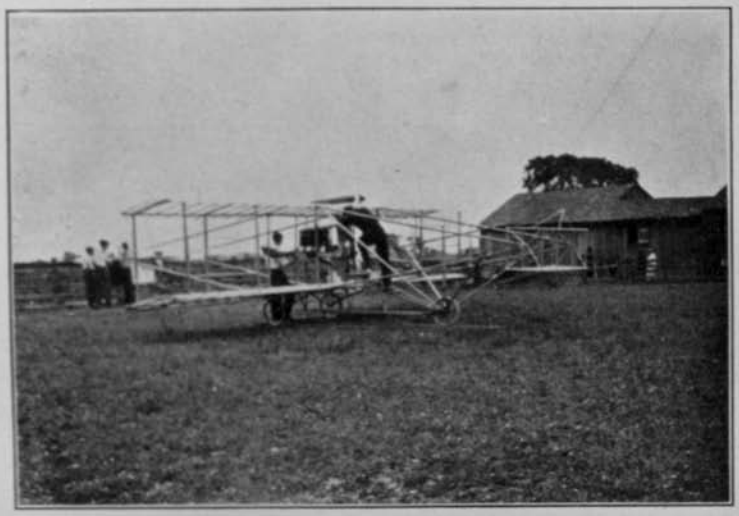
Dr. Greene, the last of the 1909 aviators to achieve tentative success was the first man on the Atlantic Coast with a new machine on the field in 1910. As most American aviators were at that time as cheerful over the Wright Brothers patents as they might be over a threatened epidemic of the black plague, Dr. Greene in his new plane resorted for stability to the vertical planes of the Voisin type. The rear control was of Dr. Greene's devising, as were most of the constructive details. In general appearance and dimensions, the machine resembled the Curtiss type. It was a beautifully finished aeroplane, with surfaces tight as drum heads, but it needed an engine that would run.

Over the long distance phone, we heard his cry for help. We told the Doctor that every "Featherweight" we could build for the next three months was bought and paid for, but that if he was down and out we could lend him a little 4-cylinder air cooled engine we had built for experimental purposes. Anything, said Dr. Greene, would be better than the dummy 4-cycle engine he had used. Really the air cooled engine was not much better, but it would run with sufficient intensity to lift the light machine from the ground and prove it a real flier. This machine was sold to Mr. Roy Crosby, of San Francisco, who made with it what were probably the first novice flights made on the Pacific Coast.

Early in April, E. R. Skinner, of South Beach, Staten Island, completed a machine built after ideas of his own and began practising in private. He had a deserted stretch of boulevard and beach,

some seven miles in length, and there, in the early gray of the mornings, he used to astonish the natives by skimming over his course like an express train, touching the road from time to time, but usually flying a few feet above the ground. So far as we know, Mr. Skinner was the second self-trained novice to make any sustained flights.

Another of the first few "Featherweight" engines turned out went to the Mathewson Automobile Company, of Denver, Colo., and is said to have been the only novice machine able to leave the ground in that high altitude during 1910. Certainly something



Our Experimental Machine

favorable must have happened for one of the first orders for the 1911 "Special" received by us was from the same firm.

As these occasional reports of tentatively successful flights began to trickle in, we grew anxious to know just how real an aviation engine we had succeeded in producing; we knew the engine had plenty of power for weight and ran splendidly on the block, but we had no opportunity to watch its performances in the air. The conditions might be altogether different, with the engine running at top speed on a slight engine bed, without fly wheel and with only a dinky radiator for cooling purposes. So we ordered an imitation Curtiss machine, set it up in a nice field, installed a 40 h. p. engine and called for volunteers.

That was only six months ago, but the field itself, as an aerodrome, is sufficient evidence to prove how very green we all were at that time. It was about 200 feet wide, bounded on the west by woods, on the east by a flock of barns and sheds, neatly bisected by a ditch and a rail fence and sprinkled with one hundred foot elm trees. These latter, we assumed, any man of brains could easily dodge or fly over; another, and equally sad assumption, however, was that any nicely finished and well appearing collection of sticks and cloth generally resembling an aeroplane in outline must be and surely was a flying machine.

Dr. Greene, who was building in Rochester at that time, looked over the assortment and thought he could find his way through the woods if the cattle tracks and small lateral ditches in the lot did not shake him out of the seat. Before we let go, he said he would not attempt to leave the ground on the first trip, but would only try to get the "feel" of the machine. We agreed with him that this was in the true spirit of cautious experiment, and at his signal we released the machine.

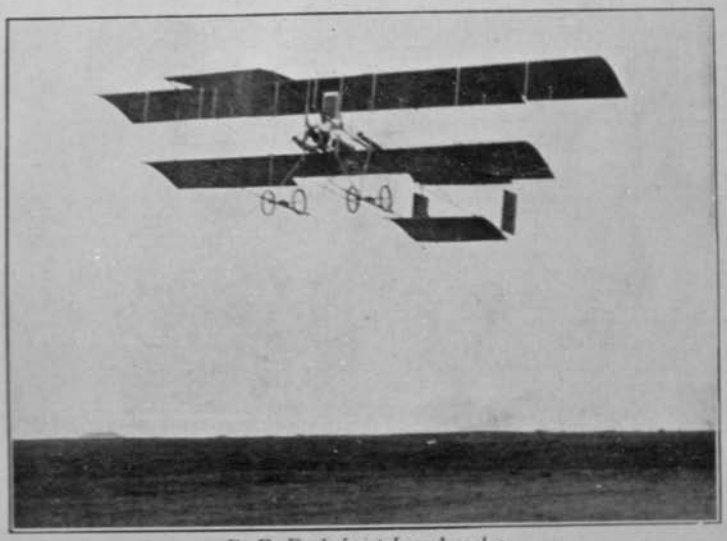
Perhaps all of two seconds was required to demonstrate the fact that a combination of 40 regular b.h.p., a very light near-aeroplane and a pasture lot, spell neither caution nor desirable results.

The machine traveled like a shot; it hit the first shallow gully about 100 feet from the starting point; Dr. Greene "eased" her over by raising the front control slightly, and in a twinkling he was 40 feet in the air, travelling at the rate of 40 miles an hour. Despite the contortions of the aviator, struggling with the ailerons, the machine sagged to the left, assisted by the breeze we had not thought worth counting on. The left wing tip touched the ground and again the aviator pulled sharply on the front control. This time the machine climbed sky-ward at an angle of 45 degrees as though intent on reaching the clouds. It appeared to change its mind, however, when a large elm sprang from the ground directly in its path, offering an inviting roosting-place on a branch some 30 feet from the ground, from which in a moment it toppled with a crash.

We, a quarter of a mile away, at first hardly knew whether to regret the apparently inevitable death of the aviator, or to rejoice in the fact that we had had visual evidence of the ability of the engine. Indecision gave away to rejoicing when Dr. Greene quite unharmed stepped from the wreck. The plane was demolished, but both aviator and engine were unharmed, and we postively knew

that we had power enough to fly. [illegible] power was continuous, we afterward ran one of the engi[illegible]id hours under full load at 1200 r. p. m. without stop, skip[illegible]nt of any kind.

By the time June arrived, there w[illegible]r of amateur machines scattered around the countr[illegible] helicopters, ornithopters, self-stabilizers, or other re[illegible]ypes. In Rochester, Everett McNabb completed one f[illegible]Demoiselle" types made in this country. He used a small[illegible]nder engine and was able to make short flights with it, though he, like others, found the small monoplane very difficult to manage.



B. F. Roehrig at Los Angeles

Out in Indianapolis, they had quite a novice camp at the time the Wright Exhibition Co. made its first public appearance. In addition to the Wright professionals, Brookins, Hoxsey, Johnstone and La Chappelle, there were these novices—Capt. G. L. Bumbaugh, backed by Carl G. Fisher, with a homemade machine of modified Farman type; J. W. Curzon, with an imported Farman; Marquette, with a Curtiss type of his own make; Beachy, with a little monoplane; and Shaw, with a biplane of the Curtiss type. Capt. Bumbaugh had an Elbridge engine; Curzon had a European made 4-cycle; Marquette, a Harriman; Beachy, an engine made by himself; and Shaw, a Boulevard.

Before the arrival of his engine, Mr. Fisher made a wager with Roy Knabenshue, of the Wright Exhibition Co., betting that Capt. Bumbaugh's machine would fly before any of the professional machines left the ground. Mr. Fisher won the bet—the Bumbaugh machine rising quickly to a good height and travelling well, but the inexperienced aviator came a cropper when he attempted to land.

Curzon made a number of short flights in his Farman machine, but his European engine proved too heavy for the power and was soon replaced with an Elbridge "Featherweight." The Bumbaugh and Curzon machines were the only ones flown by amateurs that left the ground during this first National Meet.

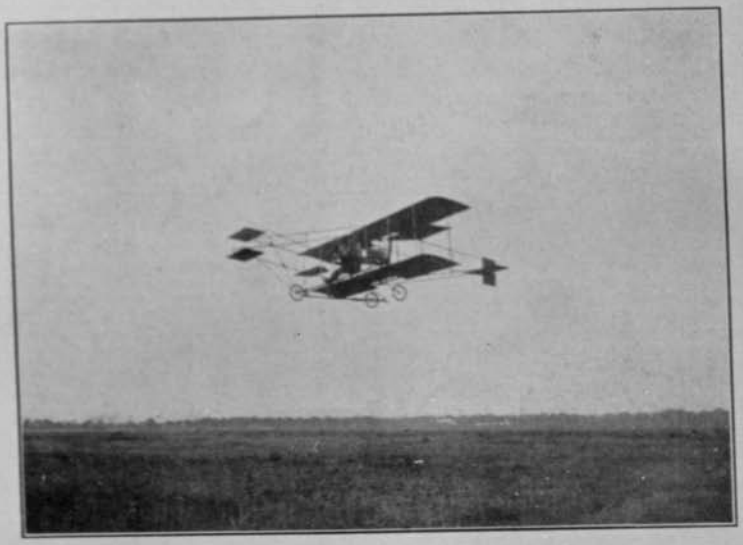
The combination of requisites for successful flying are, first, a substantial and well-balanced aeroplane; second, a good power plant; third, a well-balanced propeller of sufficient area and pitch, designed to absorb the full power of the engine without overloading; fourth, an aviator with enough mechanical ability to see that everything is right, a cool head, and good judgment. Successful flight is inevitable when this combination is brought together; impossible where any single item is lacking.

It seems extraordinary that cities like St. Louis and Indianapolis, where aeronautics have been successful and popular for years, should so far have failed to accomplish anything of note in amateur aviation. St. Louis has a number of aeroplanes and some flying has been done by Messrs. Gill, Sparling and Robinson; real results might have been attained had not a wind storm demolished six of the seven machines that were on the field during the novice meet in July. Curzon won all of the prizes at this meet and seems to promise more than anyone else in this section of the country.

Midsummer saw successful novices springing up in all parts of the country. At Mineola, L. I., during June and July, a good deal of flying was done by C. K. Hamilton, Clifford B. Harmon and Capt. Baldwin, but of the score of novice machines on the ground none had made anything better than jumps, until J. J. Frisbie, of Rochester, N. Y., made his appearance. Frisbie bought the parts of his machine ready-made from a supply house, built the machine in two weeks, installed an Elbridge "Featherweight," and proceeded to astonish the natives. Frisbie flew successfully from the first day he wheeled his Curtiss type machine on to the field. On the third day, he was able to fly in a circle, on the fifth

he flew between ten and twelve miles, and in two weeks had successfully carried passengers, flown after dark, flown in the rain, and become a local celebrity.

George Russell, with a Curtiss type machine fitted with a 4-cycle engine, was one of the first novices to make successful flights at Mineola. In July, he installed an Elbridge "Featherweight" and made his longest flight, a distance of approximately 16 miles with it. Among the other machines on the field at that time were those of Miss Todd, Messrs. Diefenbach, Talmage, Watson, Mergatroyd, Frank Van Anden, Joseph Seymour, and Philip

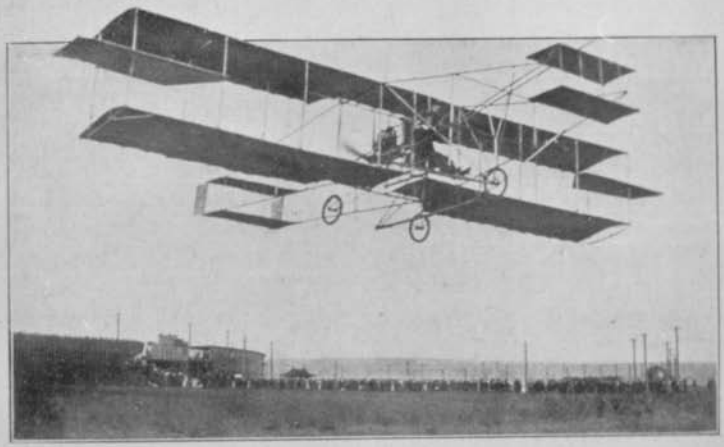


J. J. Frisbie at Mineola

Wilcox. These were all biplanes and some of them were able to fly. There were also a number of monoplanes and experimental types, none of which have flown at this writing.

Mr. Wilcox made a very pretty circle of the field early one July morning, using an 8-cylinder V-type 4-cycle engine, in his large Farman type machine. Unfortunately, on his next attempt, his machine was badly wrecked and he was unable to complete another in time to fly again during 1910. Mr. Seymour has made a number of successful flights. Miss Todd's machine has also made one successful flight.

Of these novices, Frisbie, Russell and Seymour joined the professional ranks and started on the road. There, however, they found conditions vastly different than when flying over the level plains of Long Island. They helped to prove that it is one thing to fly well over familiar and favorable surroundings, and quite another to be asked to jump out of long grass surrounded by a half-mile track, a high board fence, telegraph and electric wires, trees and buildings. Promoters and the cub reporters who cover aviation, seem to think that when a man enters an aeroplane that he is at once metamorphosed into a bird or at least the equivalent of Mark Twain's jumping frog. Almost every man who started



C. F. Walsh, winner of every prize, Los Angeles meet nineteen hundred and ten

out to do exhibition work on short notice has had to overcome, or succumb to, the same difficulties. Hamilton, Willard and Mars "busted up" as frequently in the spring of 1910 as did Frisbie, Joe Seymour and George Russell, during the later summer.

During the time that these men were flying at Mineola, reports of other successful novice flights were coming in from distant points of the country. Wm. Evans, of Kansas City, made what is in all probability the most remarkable novice flight ever accom-

plished. In Rochester he bought a "Greene" biplane ne shipped to Kansas City and assembled himself, installin 60 Elbridge "Featherweight." The machine was pronounced e te on the evening of a midsummer day. Before dark, Eva id opportunity to try a few short straight-away flights. Next e announced his intention of doing some real flying. Wha id is described by the "Kansas City Star" in part, as follows

"Soaring over the tops of the trees in the vicinity of O and Park, circling and dipping in a way that showed complete control of the frail air craft, Wm. Evans, a young Kansas City aviator, yesterday flew in his 'Greene' biplane over a circle the radius of which was about three miles, a total distance of about thirty miles."

Evans was forced to descend after nearly 40 minutes of flight on account of a pellet of solder which worked loose in his new gasoline tank and clogged the gasoline pipe. Just to show that this flight was not a mere fluke, Evans a few days later flew with the nerve of a veteran and made a very good showing in a race with Capt. Thomas Baldwin for a purse offered by a Kansas City newspaper.

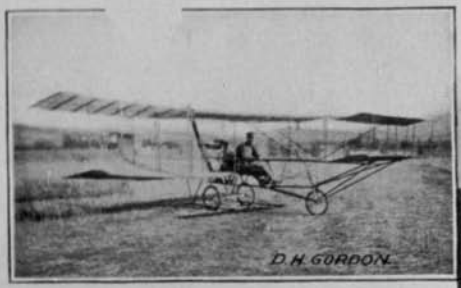
J. W. McCallum is another Kansas pioneer among the self-taught novices of 1910. Mr. McCallum's machine is not the orthodox type of biplane, but he has made a large number of short flights in it.

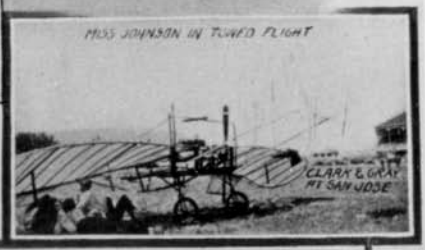
In Ohio, Michael Paridon, of Barberton, was flying as early as July 2, 1910. Beyond seeing a photograph of his machine in flight, the present writer has no record of Mr. Paridon's performances.

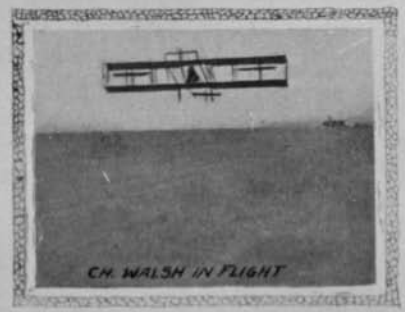
Out on the Pacific Coast, the flying of Louis Paulhan and Glenn H. Curtiss in January, 1910, aroused a great deal of enthusiasm, and a large number of amateur machines were built. To stimulate local interest, a number of special trophies were put up, among them a cup offered by Roy Knabenshue for the first sustained flight in a locally built machine.

Short, straight-away jumps were made early in the year in the vicinity of Los Angeles, but none of the aviators succeeded in attaining sustained flight until B. F. Roehrig and C. F. Walsh, both of San Diego, installed Elbridge engines in their machines. Mr. Roehrig used a 60-90 "Featherweight" in a large Farman type biplane and with it won the Knabenshue Cup. One of his

d most sensational feats was that of safely carrying a an passenger for a distance of more than a mile. Since has made some hundreds of flights, both alone and with rs, and at this writing holds the novice record for altitude, h risen to a height of some 600 feet, at a novice meet held in Angeles.







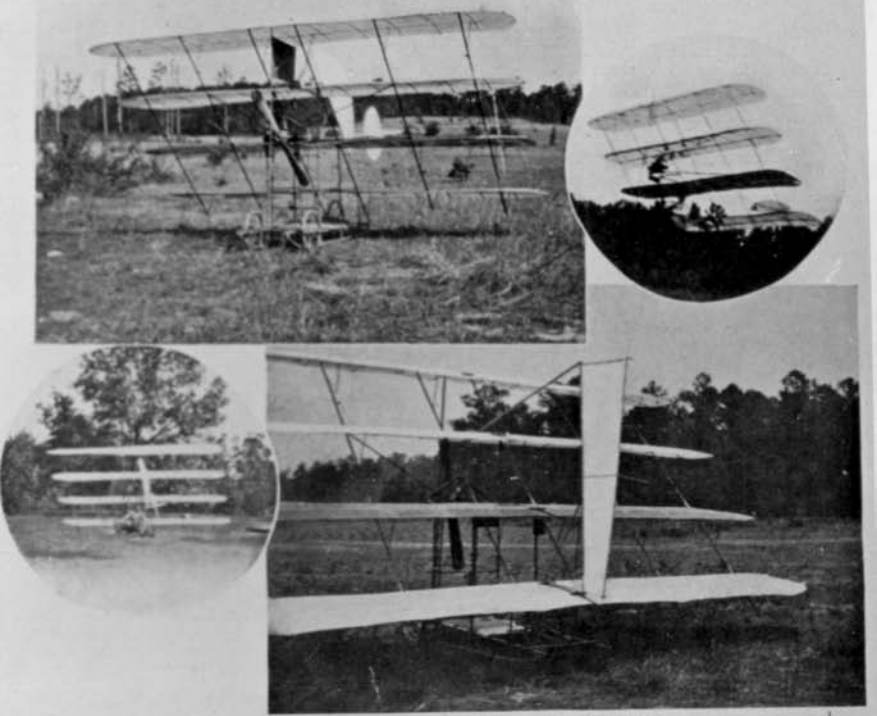
Some California Amateurs

Mr. Walsh, flying with a 30 h. p. 3-cylinder Elbridge "Feather-weight" won every cup offered at the October Meet of the Aero Club of California. He made novice records in quick starting, altitude, duration and distance. His longest flight at that time was one of 23½ minutes, a distance of some 13 miles. He was compelled to descend at the end of that time by the boiling over of the radiator.

J. E. Clark, of San Francisco, is another Pacific Coast flyer

who is said to have done unusually well. His sustained flights are reported to have numbered in the hundreds, but of the details we have not as yet learned beyond the fact that he uses an Elbridge "Featherweight" engine.

Glenn L. Martin, of Santa Ana, California, has done some good



M. B. Sellers Multiplane flying with Six H. P.

flying in the vicinity of his home city in a Curtiss type biplane, fitted with a 3-cylinder Elbridge "Featherweight" engine. The local newspapers assert that his machine is the finest in the State of California, and record that on November 23, 1910, Mr. Martin

made three very successful cross-country flights in the presence of several hundred spectators. The photographs show his machine flying high over trees and telegraph wires, and his turns are said to have been unusually short.

Among the other California amateurs who have machines and have made short flights are J. J. Slavin, George Duessler, Cannon Brothers, and Donald H. Gordon.

As an evidence of the fact that the popular types of flying machines waste more power than they actually employ, special mention should be made of the flights of M. B. Sellers, in Kentucky, and those of Mr. Gordon in California. Mr. Sellers' machine is a multiplane in which he has made a number of successful short flights, with an engine of only 4 h. p. Mr. Gordon uses a 5 h. p. motorcycle engine and claims to have made flights of up to 500 feet in length.

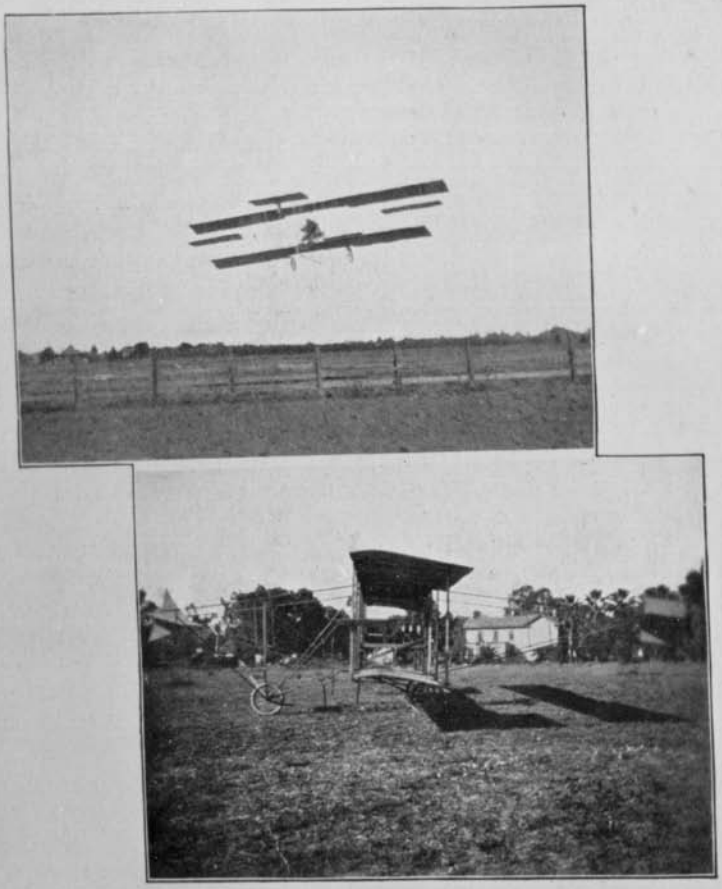
Allusions to past performances casually mentioned in newspaper clippings and correspondence, comprise present knowledge of the doings of aviators in Oregon and Washington.

New Mexico, Oklahoma and Texas are equally uncommunicative. We know that Lieut. A. F. W. Macmanus, of San Antonio, Texas, with an unusual monoplane of his own design, has made some experimental flights, and about as much of W. D. Lindsley, of Oklahoma.

Back on the Atlantic Coast, a new flock of man-birds was in the hatching. For a few weeks after Hamilton, Frisbie, Russell and Seymour went their separate ways, Mineola saw little flying. But the men who were left in camp had learned a lot from the experiences of the others; they now knew it a waste of time to try to fly with machines of freak construction, and most of them decided it was not worth while to experiment in public with new types of machines. Dr. H. F. Walden did try out a monoplane of his own design and is said to have made some short flights with it, at the cost of a few broken ribs and other minor damages. Miss Todd's large biplane with double curved upper surfaces was given trial flights, as was also the very large Diffenbach biplane, but these were the only unusual machines tried out during the later summer. None of these machines made conspicuous successes, chiefly because of defects in minor details which may easily be remedied.

Most of the machines brought out during September and October were of the Curtiss type. "Todd" Shriver, formerly with

Glenn H. Curtiss, learned in a short time to make some astonishingly good flights, using a modified automobile engine; he was the only novice developed at Mineola during 1910 to have any real success

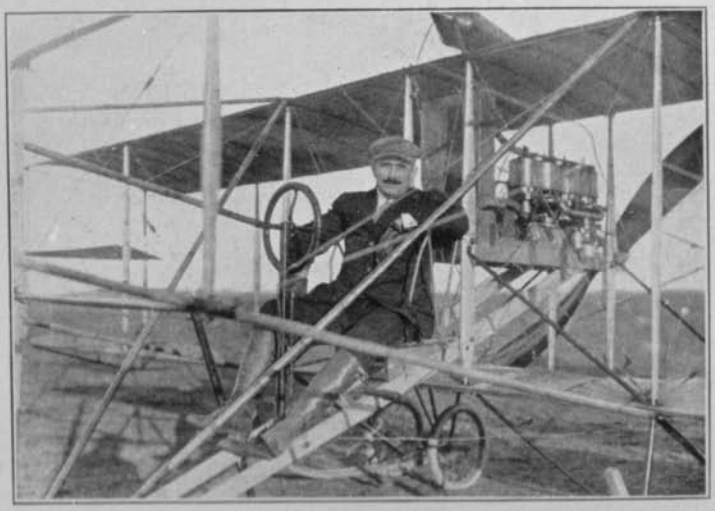


Glenn L. Martin at Santa Ana, Cal.
Only California prize winner at Los Angeles December meet

with a 4-cycle type of engine. Masson, a Frenchman, who came to this country with Paulhan, made a number of straight-away flights with a Curtiss type machine belonging to P. Brauner, and

fitted with a 4-cycle automobile engine, but he never rose high enough to make the turns.

The most successful of the post-season flyers at Mineola has been Charles Morok. Morok is a heavy man and by no means a juvenile. He flies a little machine very similar in appearance to the Curtiss type, supported on a Farman type chassis, built for him by Frederick P. Schneider. He uses an Elbridge "Feather-weight" engine, El Arco twin radiators, and a seven foot Requa-Gibson propeller. In appearance, Morok might be more easily



Chas. Morok of New York

mistaken for a banker than recognized as an ambitious aviator. His advent at Minola was marked by no flare of trumpets, and even those who knew he was interested in a flying machine gave little complimentary thought to his prospects.

But Mr. solid and phlegmatic Morok proved the greatest surprise of the year. He fussed around in his tent for a couple of weeks before he decided that his machine was ready to fly, then he brought it out on the field in the presence of a small crowd who expected to see the usual first-attempt smash-up. He left the ground after a very short run, rose immediately to an altitude of fifty feet and sailed straight away for nearly a mile, landing without

damage. Next day, despite some protests from the wise ones, he announced his intention of making a circuit of the field.

"No grass cutting for mine," said Morok. "I'm going to climb right up where I have room even if I do skid a little on the turn." And he did climb. It was his second attempt but he found the hundred foot level before he straightened out the machine, then he sailed around the field like a professional, making the difficult left hand turn without apparent effort. On his next flight, he sailed over the buildings and tents of the Aeronautical Society, and wound up his five day novitiate by making approximately a ten mile circuit of the surrounding country. From Mineola he went direct to Newark, N. J., where he gave a very successful five mile exhibition flight, and is reported by the newspapers as having circled at will the huge chimney of the glue factory, at an altitude of some three hundred feet, and to have made a spectacular dive over the grand stand. Morok is one of the few men who have been able to leave the perfect fields of Long Island after very short practise and make good at once in exhibition work.

But he is not the only man to have done such a thing. The progress of George L. Schmidt in exhibition work was far more rapid, though his flights have not been so long. He bought a machine and an Elbridge "Featherweight" engine from Wittemann Bros., of Staten Island. It was his intention to do some practising at Mineola, but he was so certain of success that before the machine arrived he had signed a contract for an exhibition flight in Vermont at an early following date. There was some delay in completing the machine so Schimdt had it sent direct to the exhibition grounds in Vermont, assembled it there, and successfully made his first flight in public.

Henry C. Cooke and Nicholas Rippenbeim both made some very pretty straight away flights at Mineola just at the close of the season. During October there were an unusually large number of machines at Mineola using Elbridge "Featherweight" engines and even more men than machines made successful flights with these engines. In addition to Messrs. Cook and Rippenbeim, flights were also made by Chester Kaufman, E. F. DeMurias, Bud Gaskell and Wilson Post. Among the other owners of machines at Mineola at this time, were Harry Harkness, who has two very fine imported "Antoinette" monoplanes; Walter Fairchild, with a large mono-

plane of original design; Harry Chandler, Glenn Ethridge, Samuel Barton and N. C. Adossides.

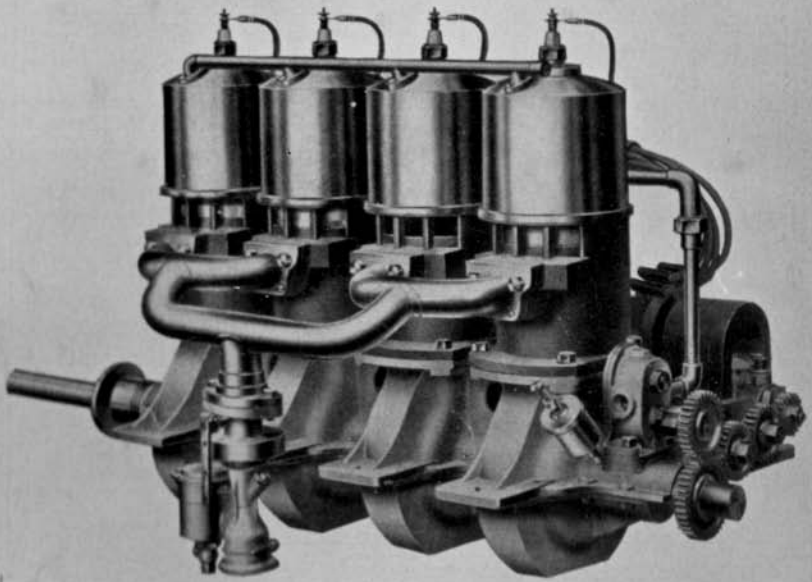
William T. Thomas, of Hornell, N. Y., has made some of the best amateur flights in Western New York. E. H. Wiseman is said to have flown the first Cleveland aeroplane in the vicinity of that city. M. F. H. Gouverneur, of Wilmington, N. C., has made successful flights with a multiplane said to be made entirely of metal. Seidlinger, of Wilmington, Delaware, has also made some successful flights in an experimental type of machine. Elbridge engines are installed in both the Gouverneur and Seidlinger machines.

One of the (to us) most amusing proofs that the combination of good machine, good engine, and cool head makes an aviator, was afforded in August, when C. C. Bonnette, in Vermont, telegraphed us a hurry order for a 4-cylinder "Featherweight" engine and a man to help him install it. As at that time all of the men with any experience in aviation in our employ were at the different flying fields we were obliged to send him an engine man who had never before been within reaching distance of an aeroplane. He not only installed the engine properly, but as well, at the owner's request, drove the machine on its first successful flight.

It was impossible for us to make a complete list of the men who have made flights during 1910 and through inadvertence or lack of knowledge we may have neglected reference to a number of men whose machines have left the ground during the year, but we believe this hasty sketch mentions at least every man who has flown a mile or more.

This is not intended as an engine catalog, but we think it not unfair at this time to make reference to the improved features of the 1911 Elbridge "Special Aero" engine. Considering that the "Featherweight" aero engines were not put on the market until the spring of 1910, a little more than six months ago, the fact that more successful flights have been made with them than with all other American made engines combined, is, to say the least, remarkable. Add to that record the fact that almost every successful flight made in America has been witnessed by, and almost every successful machine made in America inspected by, one or another of the members of this firm; we know we are in better position to realize the needs and to meet the requirements of aviators during 1911 than any other manufacturer in this country.

A glance at the illustration of the "Aero Special" will reveal its external modifications as compared with the Elbridge "Featherweight" type. The new engine is lighter in weight and more powerful than the "Featherweight" type, for it gives 50-60 net b. h. p. and weighs stripped of ignition less than 150 pounds. For experimental work, it represents more power than is actually required, but we believe the demand of 1911 will be for higher speed machines carrying all possible fuel.



The Elbridge Aero Special

This engine will be efficient at higher speeds than the "Featherweight" engine. Recent tests show that it pulls almost maximum load up to 2000 r. p. m. We have run one of the engines with dynamometer fan at 1200 r. p. m. for ten solid hours without making the slightest adjustment of any kind. The consumption of fuel for the entire ten hours was less than fifty gallons of gasoline and oil combined. We will guarantee any engine sold by us in 1911 to duplicate or improve on this performance.