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AIRCRAFT

Vol. 2

MARCH, 1911

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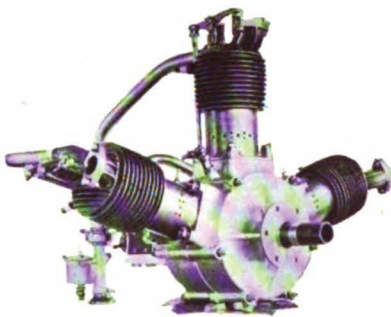
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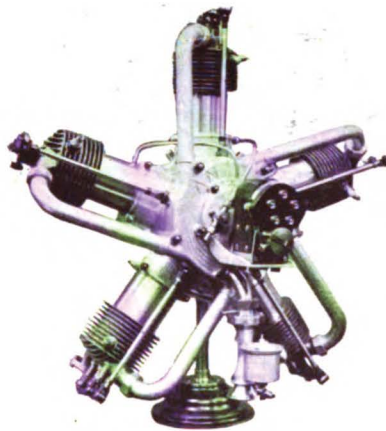
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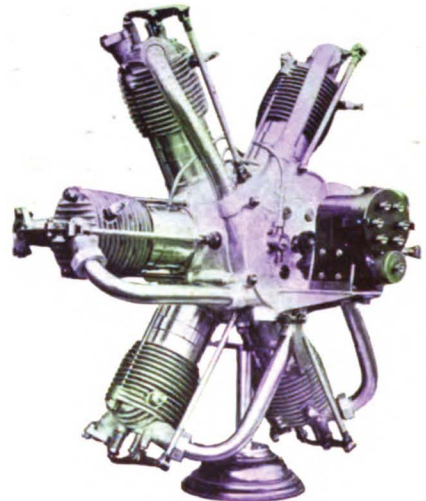
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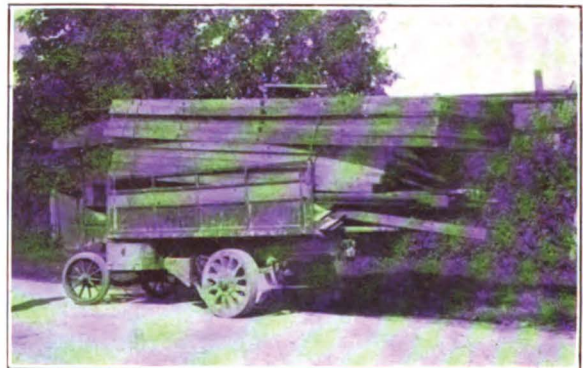


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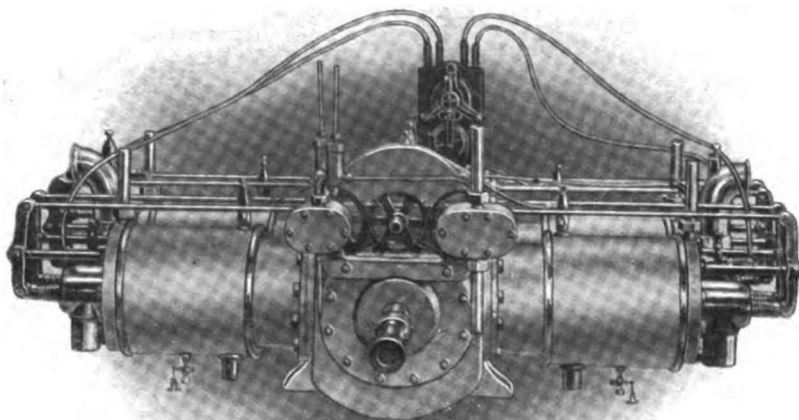
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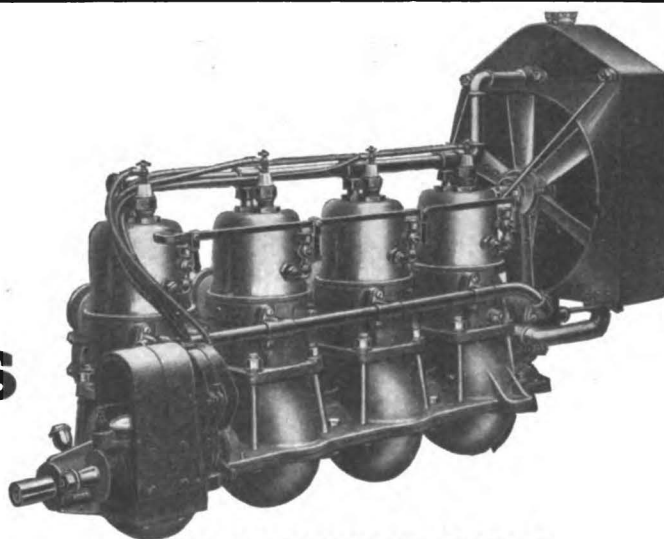
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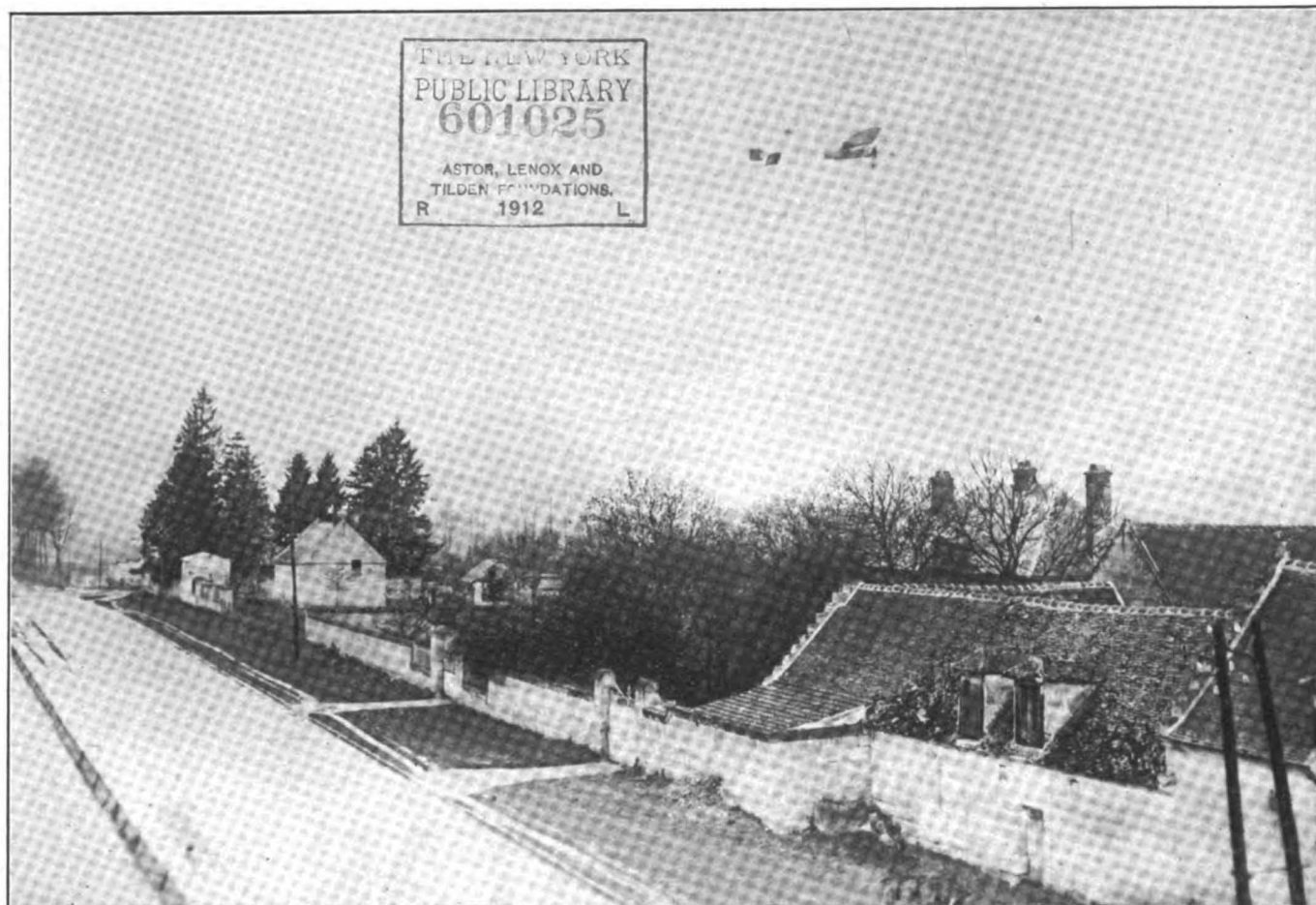
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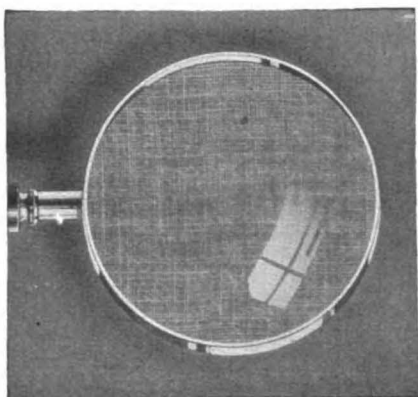
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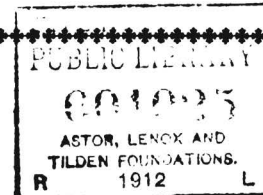
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NEW YORK, MARCH, 1911

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CONTINUOUS FLIGHT

By Henry A. Wise Wood



THE healthiest influence at present at work on behalf of the development of useful flying is probably exerted by the Michelin Cup, and such cross-country prizes as are offered from time to time. Speed and height have their respective worths, from sporting and scientific standpoints, but its ability to fly continuously over long distances in safety we must regard as the attribute which shall give to the airplane its greatest eventual value, whether as an instrument of utility, in war or peace, or of recreation. To the touring airplane of the future the amateur will undoubtedly look for his own and his family's pleasure, while in the work of transporting informative matter—the mails and newspapers—and such goods and passengers as the celerity of the airways will attract, staying-power, upon which the efficient touring machine must depend, will be a prime requisite. Safety, staying-power and speed—this, it seems to the writer, must always be the correct order of precedence. While the three are desirable the first and second are indispensable. With structural safety assured, and a dependable power-plant, the difficulty will ever increase of carrying a sufficient supply of fuel and lubricant to enable the airplane to attain the continually lengthening distances which will be demanded of it. And upon the extent of its ability to carry consumables, and its frugality in their consumption, will depend its degree of efficiency as a far traveller. It goes without the saying that, as compared with a wasteful motor, an economical one of the same power will cover a greater distance with a given amount of supplies aboard; while greater speed—which furnishes the ability to be further along on one's journey—is to be gained with every reduction in the number of mile-pounds of load carried. All of which is obvious—but is here stated to direct attention to the great educational value, upon the engineering side of flight, which attaches, at this stage in the development of the airplane, to long-distance flying. Indeed, so predominant is the importance of cross-country work that the major prizes of aeronautics, the writer believes, should be set aside for its especial encouragement.

As an illustration of the burdens under which continuous flying now labors, the attempt of Henry Farman, on December 18th last, to win the Michelin Trophy may be mentioned. With sixty gallons of gasoline and twenty-one of castor oil—weighing approximately 465 pounds—he went aloft prepared for a twelve-hour flight, which, however, he did not complete. This was a superb exhibition of carrying-power and endurance, but it strikes the mind of the engineer as having been undertaken at the prospective cost of a wanton waste of supplies. How such a huge weighting down, as was made necessary in this case by the characteristically wasteful airplane motor, handicaps the machine may be seen from this statement by McCurdy, after his splendid try at the Florida Strait:

“As my supply of gasoline and oil decreased as the result of consumption by the motor of the airplane I began to realize that I had started on the flight very heavily laden. While apparently an insignificant weight, this reduction of the gasoline and oil supplies accelerated the speed of the machine to an appreciable degree and made it more easily controlled.”

The liberal endowment of such contests as shall particularly foster the development of economical and dependable motive power is undoubtedly, as has been stated, one of the most pressing present needs of aviation.

There is another phase of continuous flight that should be given attention—the replenishment of the supplies of machines in air, the recharging of their tanks, for instance, without their having to return to ground. This brings up a new subject, bristling with interest, the discussion of which may be opened by the question, Why not?—and a statement of the law that two bodies moving in the same direction at the same speed are stationary with relation to one another. Why, therefore, may not one two-passenger machine lower fresh tanks of fuel and oil (to say nothing of a full dinner basket) to another two-passenger machine with ease and safety? The answer is that with properly constructed airplanes, suitable apparatus, and sufficient practice upon the part of the men, the feat is wholly feasible—and, the writer ventures to predict, will be accomplished before the art is another year older. From this to the exchange of objects and supplies between singly-manned machines is but a short step, while that greatest of all feats, the transfer of a man from one to another of two airplanes in flight, will follow as a matter of course. Who shall say that the Michelin prize of 1911 may not be won by a machine whose stores are replenished in mid-air? And for naval and military purposes what could more startlingly advance the prestige of the airplane than a display of its adaptability to the ready transfer from one machine to another, aloft, of ammunition, dispatches, photographic films, charts, sketches, etc.?

There is still another aspect of long-distance flight that should be given immediate attention—its dependence upon the adaptation of terrestrial cartography to its needs. The mariner has his charts, the motorist his road-maps, while the airman—well, he must travel “by guess and by God,” and rely on his homing-instinct to get him back again. It was this lack of established aids to the ascertainment of position and direction that cost poor Grace his life. He was as truly lost in the wilderness of the air as ever was Livingston in the heart of unmapped Africa. There no longer can be two opinions of the necessity for suitable birds-eye charts of the countries of Europe and America, and for the adoption, and comprehension of its use, of

the compass by all licensed aerial pilots. The only things to be determined are, should not the work of preparing charts properly fall upon the various governments, instead of awaiting the slow and inaccurate results to be obtained through the enlistment of private enterprise? And should not nautical methods and measurements be used? It needs but little imagination to realize the similarity of the requirements of nautical and aeronautical navigation. In both position and direction must at all times be accurately known; and it would seem that the air had best borrow so much of the practices of the sea as is especially adapted to its needs. This, obviously, is true of the use of the compass, and would seem to be no less true of the use of charts prepared

upon the Mercator projection, with measurements given in degrees and minutes of latitude and longitude. What, in addition, such aeronautical charts should show will form the subject of a subsequent paper, but the matter is broached at this time in order that the idea of promptly enlarging the means and duties of our Coast and Geodetic Survey, to enable it to engage in this most important work, shall be given immediate attention by those who are charged with the development of the scientific side of flying. Meanwhile, it is suggested that all aeronautical writers, working in English, should prepare the way by using exclusively the geographical (nautical or sea) mile, of 6,080 feet, or 1,853 meters, which equals one minute of latitude.

RECORDS AND STATISTICS

By G. F. Campbell Wood

Duration Records

Although duration records have become nowadays almost solely dependent upon the endurance of the motor, the progression of these records gives a pretty clear idea of the progression of Aviation itself. In the tables given below the figures in thick type indicate the World's Record of the moment and it can be seen the tremendous lead obtained in the earlier years of the century by America and the subsequent leap forward of Europe.

The first flight mentioned is the famous 852 foot flight against a 20 mile wind, of Wilbur Wright, above the sands of Kitty Hawk. On the same day three previous attempts had been made by the Wright brothers, (the first and third by Orville and the second by Wilbur) in which they were off the ground from 12 to 20 seconds, but which did not demonstrate that they had power or control for continuous flight. They are not mentioned in this table, on this account; for a similar reason the short jump of two or three seconds made by Wilbur Wright three days previously is also omitted, as are likewise the early attempts at flight of Clément Ader (1890, 1891, 1897), Sir Hiram Maxim (1894), A. M. Herring (Oct. 1898) (?), Ellehammer of Denmark (1906) and Santos-Dumont (Aug., Sept. and Oct. 1906).

As regards the flights made in Europe, it should be noted that although it was not until the afternoon of October 26, 1908, that Farman officially beat Santos-Dumont's record, he had already made unofficial flights, (one on October 15, 1908, and two on the morning of October 26th), exceeding the Brazilian's best by several seconds.

November 9, 1908, is given as the date on which a turn was for the first time made in Europe: it might be pointed out, however, that on October 26th and 27th of that year, R. Esnault-Pelterie had succeeded in making some partial turns at Buc, on his R. E. P. No. 1.

The flight of January 13, 1908, is the famous circular kilometre which won Farman the 50,000 francs of the Deutsch-Archdeacon prize; two days before this, January 11, 1908, Farman is reported to have made a flight of 1 min. 45 sec., but owing to the few witnesses of it and the fact that it was timed by the maker of the machine, with an ordinary watch, the writer does not feel justified in having it figure in these tables.

In several of his flights of 1908, Delagrange missed making considerably better records than he did through the fact that he flew so low that the wheels of his Voisin sometimes touched when making a turn. Thus, on April 11, 1908, he made a flight of 9 mins. 15 secs. and only got

A correspondent of AIRCRAFT asks what were the first non-stop cross-country flights ever made; as it may be of interest to other readers, a list of the first twelve is here given:

Distance in Miles	Approximate Time in Minutes	Aviator	Date	Course
16.8	20	H. Farman	Oct. 30, 1908	From the Camp de Chalons, near Bouy, to the outskirts of Rheims, France.
8.7	11	L. Blériot	Oct. 31, 1908	From Toury to Artenay, France.
9.2	16 $\frac{3}{4}$	L. Blériot	July 13, 1909	From Chicheny, near Etampes, to Arbouville, France.
17.	28 $\frac{1}{4}$	L. Blériot	July 13, 1909	From Arbouville to la Croix Briquet - Chevilly, near Artenay, France.
12.4	22	L. Paulhan	July 19, 1909	From the outskirts of Douai to St. Nicolas, near Arras, France.
7.5	10	H. Latham	July 19, 1909	From Sangatte, France, over the Straits of Dover.
25.	37	L. Blériot	July 25, 1909	From Les Baraques, near Calais, France, to Dover Castle, England.
22.	30	H. Latham	July 27, 1909	From Sangatte, France, to within less than two miles of the Admiralty pier, Dover, Engl'd.
10.3	14 $\frac{3}{4}$	O. Wright	July 30, 1909	From Fort Myer, Va., U. S. A., to Alexandria and back to Fort Myer.
8.7	10	R. Sommer	Aug. 2, 1909	From Bouy to Suippes, France.
12.4	18 $\frac{1}{3}$	L. Paulhan	Aug. 6, 1909	From Mâlo-les-Bains to Bray-Dunes and back to Mâlo-les-Bains, France.
12.	19 $\frac{1}{2}$	C. L. Willard	Aug. 13, 1909	On Long Island, N. Y., U. S. A.

official recognition for 6 mins. 30 secs., through touching the ground 2 mins. 45 secs. after starting. Again, at Milan on June 23, 1908, he flew for nearly 18 mins., but only got credit for 14'

27 1/5", for the same reason. The same thing happened on September 7, 1908, when in a 31 minute flight, he was continuously off the ground for only 28 mins. 1 sec.

Progression of American Duration Record.

Dec. 17, 1903	59"	W. Wright,	Kitty Hawk, N. C.
Aug. 1904	About 1'	W. Wright,	Near Dayton, Ohio.
Sept. 15, 1904	1st turn	O. Wright,	Near Dayton, Ohio.
Sept. 20, 1904	1st circle	O. Wright,	Near Dayton, Ohio.
Nov. 9, 1904	5' 04"	W. Wright,	Near Dayton, Ohio.
Sept. 1905	5' to 15'	W. or O. Wright,	Near Dayton, Ohio.
Sept. 26, 1905	18' 09"	W. Wright,	Near Dayton, Ohio.
Sept. 29, 1905	19' 55"	O. Wright,	Near Dayton, Ohio.
Oct. 3, 1905	25' 05"	O. Wright,	Near Dayton, Ohio.
Oct. 4, 1905	33' 17"	O. Wright,	Near Dayton, Ohio.
Oct. 5, 1905	38' 03"	W. Wright,	Near Dayton, Ohio.
Sept. 9, 1908	57' 31"	O. Wright,	Fort Myer, Va.
Sept. 9, 1908	1 hr. 02' 15"	O. Wright,	Fort Myer, Va.
Sept. 10, 1908	1 hr. 05' 52"	O. Wright,	Fort Myer, Va.
Sept. 11, 1908	1 hr. 10' 24"	O. Wright,	Fort Myer, Va.
Sept. 12, 1908	1 hr. 14' 20"	O. Wright,	Fort Myer, Va.
July 20, 1909	1 hr. 20' 45"	O. Wright,	Fort Myer, Va.
Jan. 17, 1910	1 hr. 58' 32"	L. Paulhan,	Los Angeles, Cal.
July 2, 1910	2 hrs. 03' 30"	C. B. Harmon,	Minneapolis, N. Y.
Sept. 12, 1910	3 hrs. 05' 40"	R. Johnstone,	Roston, Mass.
Oct. 11, 1910	3 hrs. 11' 55"	A. L. Welsh,	St. Louis, Mo.
Dec. 30, 1910	3 hrs. 16' 50"	A. Hoxsey,	Los Angeles, Cal.
Jan. 22, 1911	3 hrs. 39' 48"	P. O. Parmelee,	San Francisco, Cal.

Progression of European Duration Record.

Nov. 12, 1906	21 1/5"	A. Santos-Dumont,	Bagatelle, near Paris.
Oct. 26, 1907	27"	H. Farman,	Issy-les-Moulineaux, Fr.
Oct. 26, 1907	31 3/5"	H. Farman,	Issy-les-Moulineaux, Fr.
Oct. 26, 1907	52 3/5"	H. Farman,	Issy-les-Moulineaux, Fr.
Nov. 9, 1907	1st turn 1' 14"	H. Farman,	Issy-les-Moulineaux, Fr.
Jan. 13, 1908	1' 28"	H. Farman,	Issy-les-Moulineaux, Fr.
Jan. 15, 1908	1' 33"	H. Farman,	Issy-les-Moulineaux, Fr.
Mar. 21, 1908	1st circle 3' 39"	H. Farman,	Issy-les-Moulineaux, Fr.
April 11, 1908	6' 30"	L. Delagrange,	Issy-les-Moulineaux, Fr.
May 27, 1908	9' 30"	L. Delagrange,	Rome, Italy.
May 30, 1908	15' 26 4/5"	L. Delagrange,	Rome, Italy.
June 22, 1908	16' 30"	L. Delagrange,	Milan, Italy.
July 6, 1908	20' 19 3/5"	H. Farman,	Issy-les-Moulineaux, Fr.
Sept. 6, 1908	29' 53 3/5"	L. Delagrange,	Issy-les-Moulineaux, Fr.
Sept. 16, 1908	39' 18 3/5"	W. Wright,	Near Le Mans, France.
Sept. 21, 1908	1 hr. 31' 25 4/5"	W. Wright,	Near Le Mans, France.
Dec. 18, 1908	1 hr. 54' 53 2/5"	W. Wright,	Near Le Mans, France.
Dec. 31, 1908	2 hrs. 20' 23 1/5"	W. Wright,	Near Le Mans, France.
Aug. 7, 1909	2 hrs. 27' 15"	R. Sommer,	Mourmelon, France.
Aug. 25, 1909	2 hrs. 43' 24 4/5"	L. Paulhan,	Near Rheims, France.
Aug. 27, 1909	3 hrs. 15"	H. Farman,	Near Rheims, France.
Nov. 3, 1909	4 hrs. 17' 53 2/5"	H. Farman,	Mourmelon, France.
July 9, 1910	4 hrs. 37' 00 2/5"	R. Labouchère,	Near Rheims, France.
July 10, 1910	5 hrs. 03' 05 1/5"	J. Olieslaegers,	Near Rheims, France.
Oct. 28, 1910	6 hrs. 01' 35"	M. Tabuteau,	Buc, France.
Dec. 18, 1910	8 hrs. 12' 47 2/5"	H. Farman,	Etampes, France.

* Officially timed.

† Officially timed up to 3 hrs. 04' 56 2/5"; flight ended in darkness.

‡ Landing not officially timed; duration allowed officially: 6 hours.



EDITORIAL

THE editor of the Boston Journal recently wrote to the Editor of Aircraft for his opinion as to whether the problem of automatic stability would ever be satisfactorily solved, which brought forth the following reply:

"About three years ago, when I established my first aeronautical magazine, my views upon the future of the heavier-than-air machine were generally considered far too radical for even the most advanced flying machine builder or aviator to even consider, let alone the general public. For instance, it was generally accepted as a self evident truth by the most successful builders of flying machines, that the heavier-than-air type could never be utilized for travel in the higher strata of the atmosphere, the high altitude being left entirely for the lighter-than-air craft.

"In those days, articles written by the leading exponents of the art usually claimed that the aeroplane would just skim upon the surface of the earth in the heavy layers of air, so that when I announced that it would be the heavier-than-air type which would eventually climb to the highest points to be reached by man, my statements were usually ridiculed. However, as time passes by, I enjoy the satisfaction of noticing the aeroplane gradually climb up, up, up, until it is now able to go over two miles high, and this is only the beginning.

"Here are a few predictions made after years of the most careful study of the subject, as to what I believe will come to pass within the next ten years:

"THE FLYING MACHINE WILL BE ABLE TO ASCEND TO A DISTANCE OF OVER TEN MILES; THE FLYING MACHINE WILL BE ABLE TO STAY IN THE AIR FOR MORE THAN FIVE DAYS AT A STRETCH; THE FLYING MACHINE WILL BE CONSTRUCTED TO CARRY MORE THAN FIFTY PEOPLE; THE FLYING MACHINE WILL BE MADE CAPABLE OF CROSSING EITHER THE ATLANTIC OR PACIFIC OCEAN; THE FLYING MACHINE WILL HAVE ACQUIRED A SPEED OF MORE THAN 200 MILES PER HOUR.

"These feats will all be accomplished by the flying machine within ten years. I could tell you some far more wonderful things to be looked forward to in flying within a hundred or two hundred or a thousand years hence,—but I am afraid I might be taking too many liberties with some of your readers.

"However, the above statements will probably be sufficient to answer your question, as far as I am concerned,—'Will the problem of automatic stability ever be satisfactorily solved, for these things could not happen unless automatic stability is a factor in flying?'

"I might add here, that a flying machine will event-

ually be constructed that will be unable to descend to the earth unless it is steered in that direction.

"This is not an article, but merely a five minutes talk to my secretary."

* * *

ONCE upon a time during the foggy past, some human brain with more monkey humor than reason, created the following oracular expression: "If you travel on a railroad train on land, and there is a smash-up, why, there you are. But if you travel on a steamship in the water, and there is a smash-up, well, where are you?"

Since water travel has been made actually safer than land travel, owing to greater precautions being taken to safeguard travelers in that branch of transportation, no doubt **ORDINARY MORTAL** with loud snorts, will again utilize the expression with variations, when referring to Air travel.

Bright fellow is **ORDINARY MORTAL**.

* * *

A DISPATCH from Jefferson City, Mo., under date of January 20th, stated that Representative Warren introduced a bill in the House to prohibit aeroplanes making ascensions higher than one thousand feet, and requiring aviators to give a ten thousand dollar bond as a guarantee against violation of the law.

At the present writing we cannot appreciate this joke in its fullest sense, not knowing whether **IT** is on the Representative, or whether **HE** is **IT**.

* * *

A CABLE message from Berlin states that the airship Suchard is completed and ready for trial flights preparatory to an attempt to cross the Atlantic Ocean from St. Vincent, Cape Verde Islands, to some point in America that can be most easily reached with the aid of the Trade Winds.

The inventor, Joseph Brucker, has some startling innovations to offer on Trans-Atlantic expeditions, not the least of which is that he intends to try out his airship before starting on his long journey.

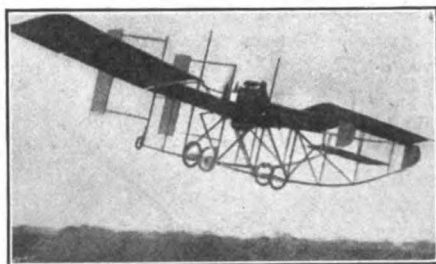
* * *

WE advise our friends who are anxious for the healthy development of aviation upon good substantial lines, not to be too hasty in suggesting laws against flying men or their machines. You may rest assured that some of these antidiluvian legislators will enact stringent enough laws for even the most exacting adherent of the movement without being asked for them, and once a law is on the books it may take years to get it off again, thereby retarding American progress indefinitely.

SUCCESSFUL FLYERS DESCRIBED

THE "VALKYRIE I"

By W. H. Phipps



THE "VALKYRIE I" DESCENDING AFTER A SUCCESSFUL FLIGHT.

A successful machine which differs from accepted designs is the "Valkyrie I" monoplane—a product of the Aeronautical Syndicate, of Scotland. Its peculiar characteristic is that it flies tail first. As a type, however, it somewhat resembles an old-time Wright biplane, with the upper main plane removed, the only difference being that a stationary supporting surface is placed in the front, and an elevator just below and a little to the rear of it.

It is interesting to point out in describing this machine that most of the successful model aeroplanes now flown in competitions are of the "tail-first" type, the "Valkyrie I" being really a development of this type of model.

In looking at the accompanying illustrations it is important to bear in mind that the large leading front plane is a stationary supporting surface, fulfilling the same purpose as a lifting tail on a monoplane.

The elevator is used solely for ascending or descending, and in normal flight is held perfectly flat. A Farman-type lever operates the elevator and the ailerons, while the rear rudders are operated by a pivoted foot control. These rudders were formerly situated close up to the main planes, but in practice it was found that their action was not quick enough, and the machine had a tendency to skid. In order to increase the action of these rudders it was found necessary to place them four feet to the rear of the main planes, while, to prevent skidding, two small fixed vertical planes were fitted to the front of the skids, as on the Wright machines.

Regarding dimensions, it should be noted that the "Valkyrie I" is much broader than it is long. The machine weighs 520 pounds for 140 square feet of surface. This weight is approximately

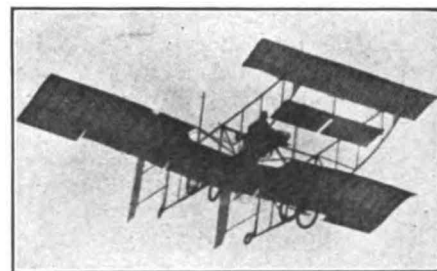
that of the Blériot, a monoplane of much less spread and surface. The lightness is due to detail design, for the machine carries a 30 h. p. Green engine. A departure from the usual monoplane practice is the use of a single-surface main plane instead of the customary double surface.

The ribs are attached to the main spars by special aluminum sockets, which are illustrated in one of the accompanying drawings. The ribs themselves have a slightly triangular section.

The main plane is built in three sections, the rear spars fitting into special sockets, which arrangement permits the adjustment of the angle of attack of the main planes. The central plane-section is of a smaller chord than the two end sections, and is adjusted to a smaller angle because of its presence in the draught of the propeller.

The method of guying the main planes is shown in one of the accompanying illustrations. The wires are of larger gauge than usual, cut to the approximate length and then threaded so as to take an ordinary nut. The wires pass through special aluminum lugs, here illustrated, and are tightened up by turning the nuts.

Turning to the details of construction, some of which are illustrated in the accompanying draw-



THE "VALKYRIE I" AS SEEN FROM BELOW. NOTE LEADING FRONT PLANE AND ELEVATOR BELOW IT

ings two flexible steel cables, as shown in the illustration.

The rear castor wheel and its special aluminum mounting is shown in an accompanying drawing. It should be noted that the upturned skids can act as a very effective brake. By stopping the engine and depressing the elevator the pilot can cause all the weight of the machine to be thrown on the upturned skids, thus quickly bringing the machine to rest.

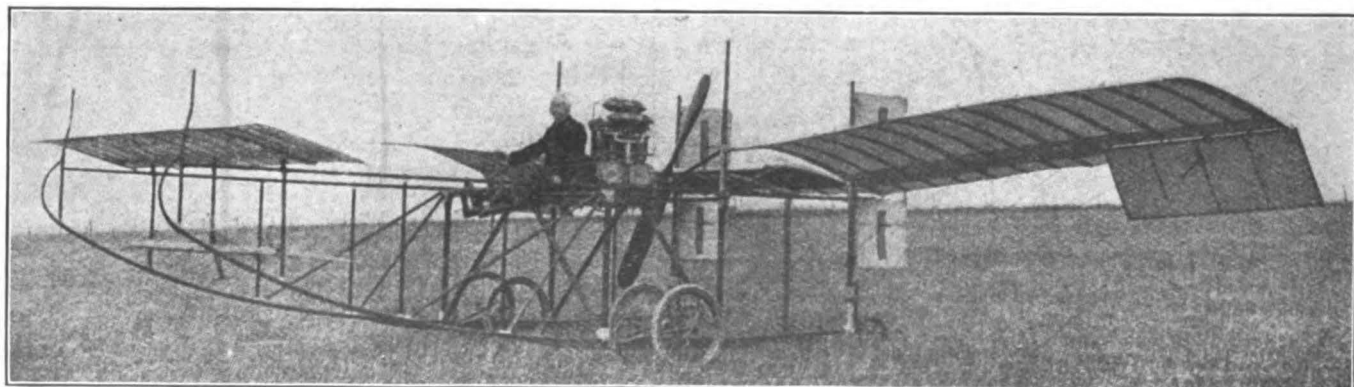
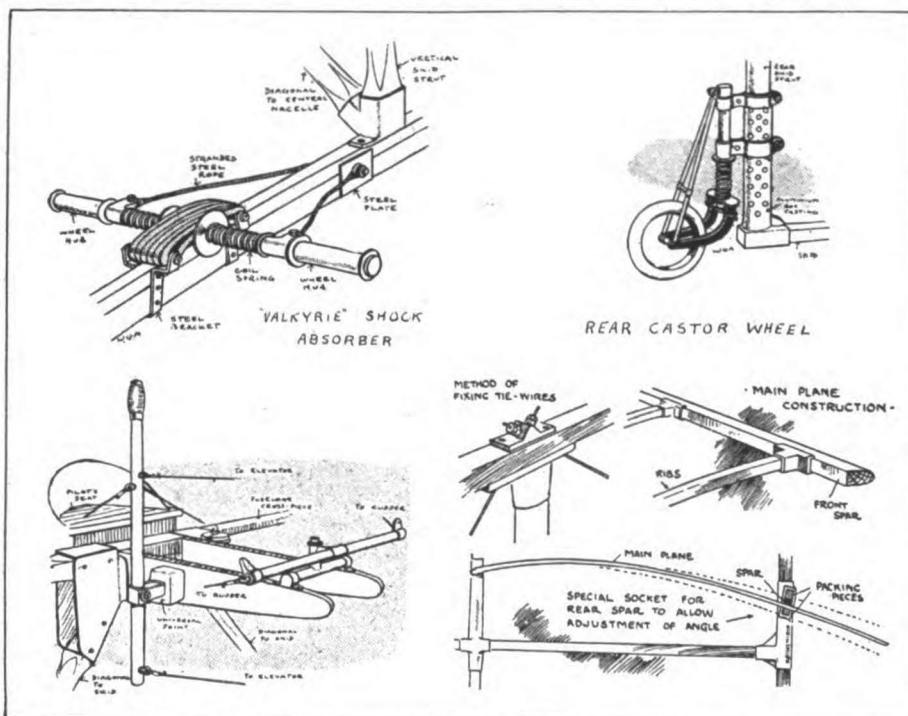
As a beginner's machine the "Valkyrie I" has found favor, owing to its strong construction and the long skids which have prevented many a bad accident.

In conclusion, it may perhaps be of interest to summarize a few of the detail weights and dimensions:

Weights.—Main planes, 50 lbs.; front planes, 23 lbs.; chassis frame, 105 lbs.; wheels, 50 lbs.; engine, 155 lbs.; magneto, 10 lbs.; dual ignition, 15 lbs.; propeller, 22 lbs.

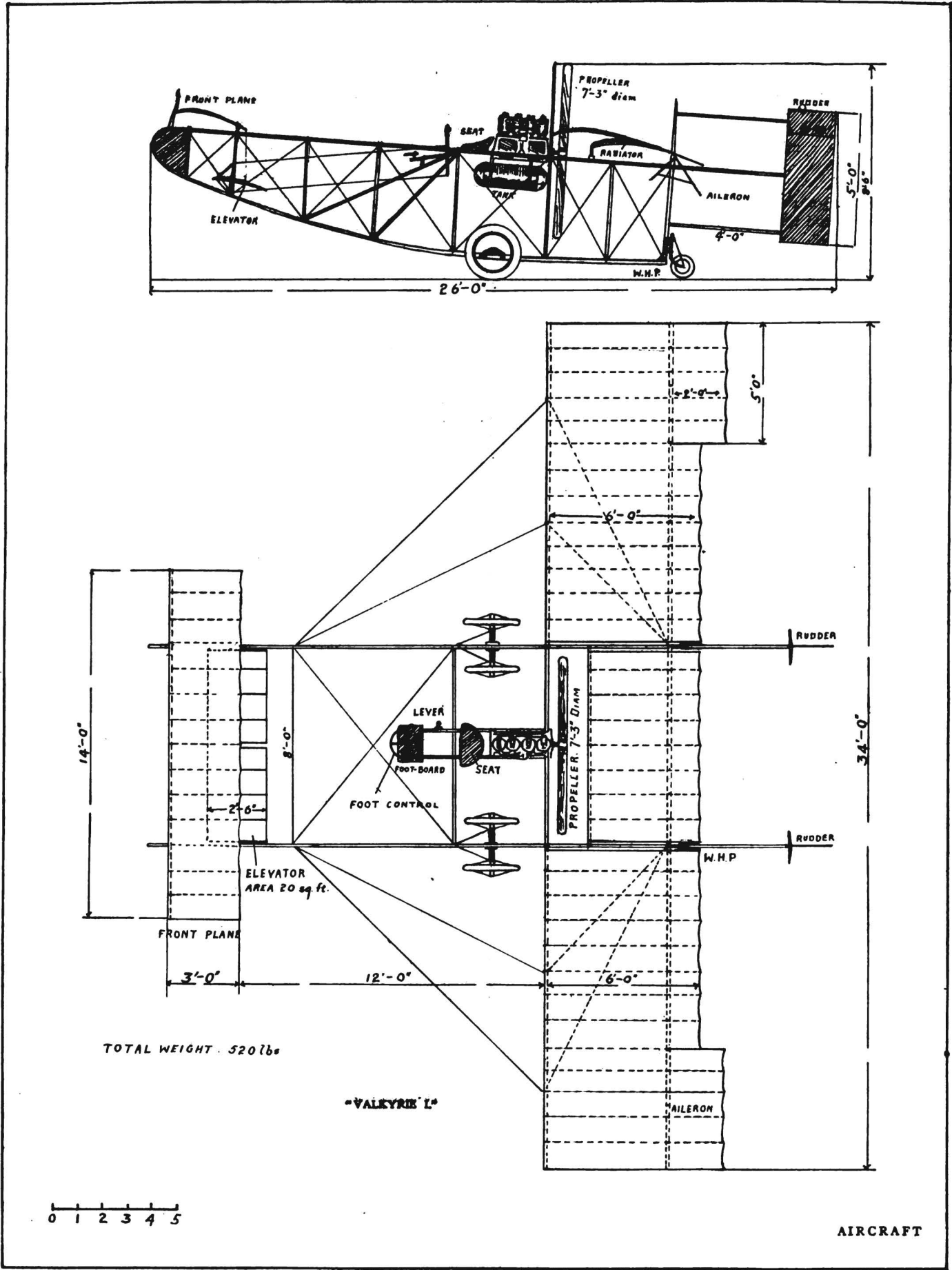
Dimensions.—Propeller, diameter, 7 ft. 3 in.; pitch, 4 ft. 1½ in.; angle of incidence of the main planes with the propeller-shaft, 9 degrees; maximum camber, 5 in., situated one-third of chord from leading edge; main fore and aft booms of chassis frame, 1¼ in. square section. Skid-members are of the same size, but strengthened by extra pieces, which double the depth in the vicinity of the axle; main plane spars,

2 in. by 1 in. (front), 1½ in. by 1 in. (rear). **Materials.**—Honduras mahogany is used almost exclusively throughout the machine. The surfacing of the planes is made with unproofed Egyptian cotton fabric. The back edge of the plane is stretched by a cord. Soft steel wires of large gauge are used for all bracing. The joints and fittings are of aluminum.



"VALKYRIE I"—GENERAL VIEW OF THE MACHINE BEFORE CHANGE IN THE POSITION OF THE VERTICAL RUDDERS WAS MADE.

SCALE DRAWINGS OF THE "VALKYRIE I" MONOPLANE



Aeroplanes and Dirigibles: Their Respective Spheres

By T. R. MacMechen

FEW people believe nowadays that the dirigible has as great a future as the aeroplane. In the mind of the writer this is a radical mistake; both dirigible and aeroplane have their respective functions to perform, and the ultimate air-craft will probably embody a combination of both principles. During the stages of their respective developments they will perform different missions of a practical nature.

The mission of the aeroplane will be two-fold: that of a war auxiliary and that of a passenger-carrier. The auxiliary aeroplane and the passenger-carrying aeroplane will be two quite different machines. The auxiliary type will very soon be used as a means of communication for warships at sea: it will establish rapid communication between the various units of a fleet and will also make over-sea excursions of fifty to a hundred miles for the purpose of observing hostile squadrons, but its radius of action can hardly be ever more than that because it is no more than a warship tender and must needs go and return on a small fuel supply.

The auxiliary aeroplane will not carry more than two or three men but it will never be in control of a single individual. It has already been demonstrated that it is not safe to leave the handling of any type of air-craft to one man for the simple reason that if he meets with very contrary weather conditions he is unable alone to attend to the many and diverse duties called for in managing his craft: this is the very thing responsible for so many accidents to aeroplanes in charge of one man, several of which have been fatal; the single operator of to-day has to fill the rôle of three or four men: he has to control the fore-and-aft equilibrium and also the side balance; besides this he has to act the part of motor-man and above all this he is the navigator of his craft and the lone aviator has to depend entirely upon his own resources to cope with all the disturbances and changes met with in the air and the resultant surprises and dangers. A crew of two or three will therefore be necessary as well as sufficient for the auxiliary aeroplane.

The passenger aeroplane is quite a different proposition: here human life is entrusted to the care of those who are directing the craft: the crew of a passenger aeroplane is in exactly the same position in relation to the aviator as passengers on a train are to the engine-driver and transatlantic voyagers to the captain of their ocean liner. Legal requirements will most certainly place upon those operating passenger aeroplanes the necessity of employing navigators, pilots and engineers of proven skill, capacity and prowess, just as similar requirements are made of those in charge of present great transportation systems.

Now what will constitute a safe passenger aeroplane?

Certainly it will be a very much larger structure than the pioneer aeroplanes of to-day. Certainly it will *not* be trussed and held together with sticks. From indications which the present affords us it is more than probable that its wings or carrying surfaces will be of light sheet metal; it will have a very simple and powerful landing-gear which will serve to absorb any shock, however rough may be the ground chosen for alighting; the almost-safe landing gear of the present big Farman machines is an indication that this will before long be accomplished.

To meet with popular favor the passenger aeroplane must be capable of journeys, not only of an hour or two but covering two or three hundred miles; the very first requirement for this is of course the capacity to carry sufficient fuel; the question of engine power is not so important, recent experiments showing that an aeroplane of very moderate power can carry six or eight men for short distances. To carry

both the passenger and the fuel necessary to transport them several hundred miles, it is evident that aeroplanes will have to be built much larger.

There is another and really more important reason why aeroplanes will have to be built larger: to increase their safety. It is well known that the eddies and swirls of the air near the surface of the earth correspond to the surf of the sea near a rocky coast; in these no passenger-carrying air-craft should venture, especially in a storm, but on rising from the earth or returning to it they sometimes have to be met. The present method of coping with these surprises of the air is by the instinct of the pilot alone. This will never do for a passenger machine; it will have to carry a dozen different kinds of instruments to acquaint the pilot instantly with conditions, both those which are to be met and those which are being met at that moment. Such a thing as guessing at what height above the ground the aeroplane is travelling will not be tolerated legally or otherwise on a common carrier of the air. At present the pilot has no way of determining how high he is above the ground and owing to the constantly shifting points of view the appreciation of his altitude is no easy matter. Many accidents are due to the fact that when going fast and near the ground aviators miscalculate their distance from the earth.

Other instruments necessary on an aeroplane are a compass, a barograph, instruments to give the speed of the plane as measured over the ground and its actual speed through the air, regardless of the motion of that air: they will enable the flyer to navigate in fog and in storm, when read and interpreted by a navigator and an assistant pilot. The engineer will have nothing to do with this feature of the work;—he is supposed to attend to the engines alone in the same way that a pilot is supposed to attend to steering the craft and nothing else.

The passenger aeroplane will have to be run on these lines before it is permitted to carry passengers: division of labor will be carried out in the control itself, one pilot handling the fore-and-aft control and another taking the side control.

Another point which will be deemed necessary by law will be the presence of a reserve motor ever ready to help or replace the regular motor. Aeroplanes will also be supplied with decline gauges which by a magnetic register will detect and record gusts on the wings, rudders and balancing tips a fraction of a second before they actually contract the surfaces.

To sum up, to insure the absolute safety of the traveller it is natural that the most extraordinary precautions ever provided on any conveyance devised by man should be brought into play and it is the weight of all these appliances which will call for a much larger aeroplane than those of to-day, for this extra weight calls for more strength and there are no known metals out of which you can get strength at the expense of weight.

As regards the protection and comfort of air-travellers it is well to point out that little or no provision has so far been made in this line. In some present-day aeroplanes, aviators and passengers travel with their heels dangling over space!

As to how the passengers will be carried, there is and can be no mystery: there is only one way in the world in which to carry a number of people through the air, whether by aeroplane or dirigible. Science confirms the experimental fact that huge tubes cannot be pushed through the air unless they are in the shape of a lengthy cylinder with pointed ends: the travellers on a passenger-aeroplane will be carried in a torpedo-shaped shell extending from front to rear across the wings. This gives the aeroplane a centralized body about

which to build it, making it stronger than it has ever been before without increasing its weight.

Both to the technician and to the constructor the probability of an aeroplane shortly carrying twenty to thirty passengers seems great, but beyond this carrying-capacity the aeroplane appears to become prohibitive, on account of the enormous energy required to lift it and propel it.

These passenger-aeroplanes will not travel fast; this fact was appreciated long ago by Wilbur and Orville Wright; it is what has kept them from building racing machines. The big Farman and Wright machines which carry forty-five and thirty H.P. respectively do not make over forty to forty-five miles an hour: large planes cannot be pushed through the air as rapidly as small ones and to sustain the weight of engines and passengers they are made to fly at a very positive angle.

As regards balancing the big machine has all the best of it for the simple reason—apparent to any mind—that the swing of its oscillations in the wind is slower than on the small machine; this can be seen when a Farman and a Blériot are flying together. Build the Blériot larger and it will go slower; on the other hand take a large machine, trim down its wings and make them quite flat and it will go faster, but the moment this is done down goes the carrying-capacity and as a result, the radius of action. The popular mind has not begun to understand that the size of the machine does not change its principles: a giant Blériot with giant planes of ninety feet would need a thousand H.P. to carry three men a hundred and twenty miles and then it would only carry them half an hour longer than Alfred Leblanc flew at Belmont Park.

This is not theory but fact—fact of which any one can satisfy himself by taking Blériot's own scale and figuring out the machine.

Concerning the relative efficiency of the biplane and monoplane it may here be said that it has not as yet been generally understood that the biplane through its construction has almost double the lifting effect of a monoplane. The monoplane having only one pair of wings is heavier in the air and must be built almost one-half as small as the biplane to rise at all off the ground. This is the reason that military experts, both here and abroad, were unanimous in representing to their respective governments that the two-plane machine was by all odds the most effective for carrying crew, ammunition and fuel, and even for mileage.

The craze for speed is a foolish dream: like the idea of racing automobiles, the desire to fly at great speed is the resultant of man's wild desire to bore nature. Forty to fifty miles an hour is fast enough for an air-craft because it is travelling in a free air-way and in a far more direct line than a train or an automobile; buildings, fences, towns, forests and other things which impede transportation on the earth's surface do not stop it and an aeroplane travelling at this speed has the advantage over any form of land travel going twice as fast and will arrive sooner at its destination.

The desirability of comparatively moderate speed for air-craft being established the writer is naturally brought to a consideration of the rôle of dirigibles.

The Zeppelins have already reached a speed of forty-two miles an hour and there is every reason to believe that for carrying small groups of people between points not too far distant the dirigible has a future as a useful instrument of civilization. In warfare the problem is different; it can afford to waste power for it is then an instrument of punishment and destruction pure and simple and performs its function as do armies and gunpowder. When the abolishment of war started by the Hague Tribunal becomes a fact, air-craft will assume their true position in the world but at present their possibilities as instruments of offence and defence are receiving the consideration of the whole world.

Of the relative merits of the dirigible and the aeroplane Nicola Tesla said: "The dirigible is all the better the larger; the aeroplane gains nothing with size."

It has been conclusively demonstrated by Zeppelin that the larger the dirigible the more practical and the more easily handled it is. We base all our power on machinery and the larger dirigible will carry the greater engine power, the one which will enable it to be under the best control in a storm. The dirigible as understood by Zeppelin is a true ship of the air, a "Mauretania" of the air growing stronger as the size is increased and the various gas-containing compartments of which are isolated in separate flotation-chambers inside the hull. This is very different from the non-rigid type: a great gas-bag containing all its flotation power within it and which, if punctured, gives a vent for the immediate escape of its entire supply of gas. The Zeppelins have lost the contents of one gas-chamber or one-seventeenth of their lifting power without being obliged to land.

Another point in favor of the rigid airship is that its aeroplane-rudders and guiding planes are fastened to a solid structure where in other dirigibles they are attached to the car; the car in this case is the ship and the ship is sailing under a gas-bag but with the Zeppelin the gas-filled cylinder is the hull of the ship. Beneath this solid hull and rigidly attached to it is the passenger-cabin which runs along its entire length; it is thus one rigid entity which pierces the air like a spear.

Such a craft can be built very large and it is not too much to say that in the near future it will be built to transport two hundred passengers. It must be borne in mind that the "Deutschland" has already carried thirty-two passengers in addition to its crew of eight; she was but 482 feet long,—a canoe in comparison with the airships of the future.

Already laid down on paper in the engineering offices of the Zeppelin Construction Company are the design and drawings for an airship a thousand feet in length. There is no immediate prospect of this ship being built but one of six hundred feet in length is positively known to be projected for service within two years: such a craft could carry twice the power of the "Deutschland."

Now as to the policy pursued for the security of these great craft: the "Deutschland" was designed to be always equipped with twenty hours' fuel so as to be capable of riding out great storms, the length of which rarely exceed this period. Of course in a storm an airship should no more land than a ship on the sea approach a coast and with twenty hours' fuel on board there is no conceivable reason why it should land: as long as it is free in its own element it is safe. There is nothing to prevent it moving with the storm until either by rising or falling it passes into a stratum of calmer air and thus allows the storm to pass on its way.

There is no guess-work about finding this calmer stratum. What is wireless for? The upper air has already been sounded, its movements must be noted and recorded and this branch of air-science developed for air-navigation in a broad sense such as has not yet been understood.

To return to the "Deutschland" the loss of which created such a stir, the purchasers of the ship decided to run it with nine and a half hours' fuel instead of twenty, in order that the weight saved could be replaced by that of passengers at fifty dollars per head. Zeppelin dirigibles have safely performed a laid-out programme not once but fifty times; in this instance the "Deutschland" was caught in a storm of fifty and more miles an hour; it went back and forth in this hurricane seeking a safe landing-place over swampy ground; it was turned about four times in the midst of the tempest, its rudders working perfectly either going against or with the wind, but the storm outlived the "Deutschland's" nine and a half-hour supply of fuel with the result known.

These facts speak for themselves: was this really a dirigible or not? Zeppelin thought it was and was so satisfied that

he decided to proceed to build larger craft with greater engine power and a larger supply of fuel.

The average American mind has but a superficial knowledge of aeronautics. This is perfectly natural; it has only been within the last few years that the busy American has had his attention turned from that world of business that generally occupies his life.

In Europe it is otherwise; in Germany one million marks are involved in the recently established Zeppelin supply station and aero-park at Pottsdam, near Berlin. The establishment of this station at this spot received the sanction of the emperor himself. A hotel and café are to be opened there by the well-known Esplanade Company of Berlin; a branch railway line will be extended there from the town of Pottsdam and in 1912 this aero-station will be the headquarters of a six hundred-foot Zeppelin. This Spring the new and larger Zeppelin replacing the "Deutschland" will go into commission at Düsseldorf; in July another Zeppelin is due to take the place of No. VI which was burnt up at Baden-Baden and before the end of 1912 two more colossal craft will be occupying the great steel air-harbour now being built at Hamburg.

Although the rigid airship has here been referred to exclusively, this is not to say that the semi- and non-rigid types of dirigibles have not their practical function to perform. Such an airship as the "Clément-Bayard II" (which went from Paris to London in six hours) and especially the "Morning Post," (the semi-rigid which drove across the English Channel at by no means its narrowest point with a strong cross

wind tending to deflect it from its course but in no way succeeding), has shown what they can do.

In fact these ships have their advantages when it comes to landing and deflation. This can especially be said of the Parsevals which are especially built with the idea of being easily deflated. They cannot however, in any way come near the Zeppelins for endurance. The gas contained in these great bags is affected by the changes of temperature (the small hourly changes of sunshine and shade and the greater diurnal changes of night and day) just as that in spherical balloons; in fact there is little difference between the spherical and the elongated gas-bags, outside their shape and the system of balloonets or air-bladders which keep the dirigibles taut and maintain their shape.

With the Zeppelins the atmospheric changes do not immediately affect the gas, as the seventeen or eighteen gas-chambers are ventilated by air and not in direct contact with the sun's rays or with the outside air. This is with the idea of maintaining an even temperature around the gas; if it is hot outside cold air is pumped into the hull; if it is cold outside hot air is introduced into the hull from the motor exhaust. The less changes in the temperature of the gas the longer the ship will stay up.

Reference was made in the preceding pages to the instrumentation which will be necessary for future heavier-than-air machines. It is interesting to note that the latest lighter-than-air craft carry as many as twenty-eight different kinds of navigating instruments, among them a powerful wireless equipment and special compasses somewhat after the ingenious ideas of Marcus.

A "Flying Fish" from Detroit

The hydro-aeroplane here shown is expected to skim over the surface of the water at from sixty-five to seventy miles an hour; the builders have named it the Flying Fish.

The first working model was taken out a few weeks ago, and skimmed over the ice, scarcely touching it, at a speed of sixty-five miles an hour. This, too, was with a less powerful engine than that with which the Flying Fish is equipped.

The hull of the Flying Fish is a water-tight steel and aluminum tank, 5 feet 7 inches wide, 7 feet 2 inches long and 2 feet deep. The bow end is slanted, but all other angles are ninety degrees. Above the hull is the plane, twenty-six feet from tip to tip and six and one-half feet wide. The convex frame is covered with khaki oil-soaked canvas.

Extending behind the hull, not unlike the handles of a baby buggy, except that the arms are steel and the wooden crosspiece is a foot wide, is the "tail." On this flat board, five feet seven inches long, a foot wide and a half an inch thick, about ten feet back of the hull, the craft is expected to fly—that is, when the boat attains a sufficient speed forward, the plane is expected to lift the hull out of the water entirely, only the "tail" touching at intervals and steadying the flight.

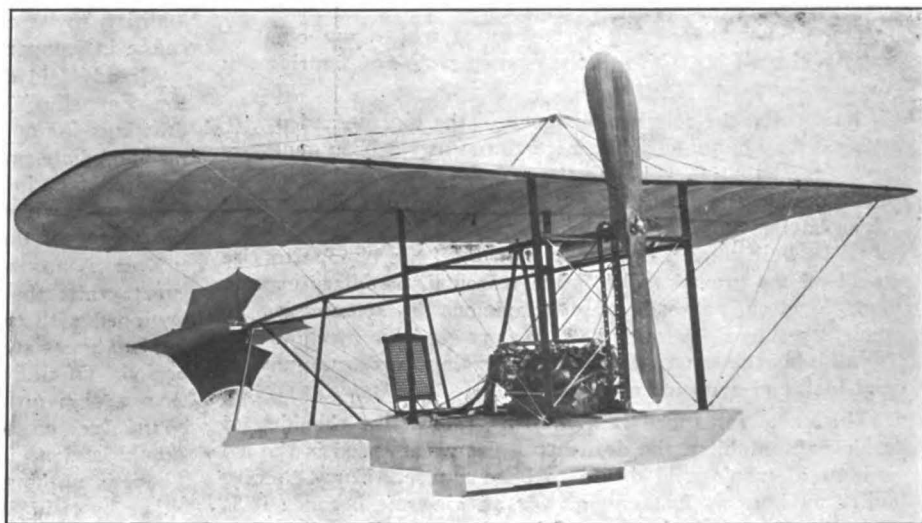
Also behind the hull is the rudder, four-vaned, the blades being covered with canvas. At the front of the hull is the propeller, which is a double blade of wood more than six feet from tip to tip.

In the rear of the hull is the cockpit, into which the feet of the skipper extend as he sits on the cane backed chair balanced on the stern rail. Immediately in front of him are the engines and two levers, one controlling the rudder, the other the single plane. Complete the craft weighs only 750 pounds.

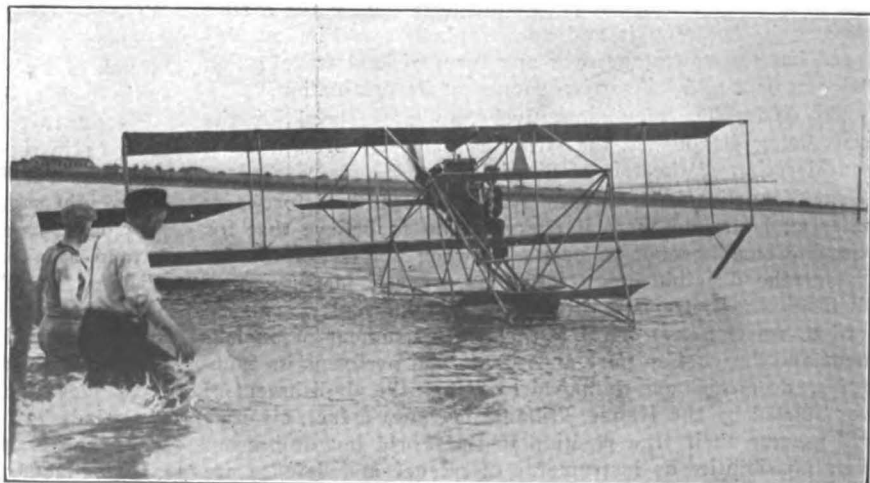
"The Flying Fish will float perfectly on the water," says Fred Wadsworth, secretary and treasurer of the Michigan Steel Boat Company. "There is less danger of its tipping than an ordinary boat on account of the plane. Even should the boat be entirely out of the water and the engine fail there would be merely a drop of a few feet in a non-sinkable, perfectly balanced and safe hull."

"Our boat is not expected to fly any great distance or at any great height. The rush of air may catch the plane and lift her up eight or ten feet for a short distance. The tail piece will always be in the water, sustaining her in a steady flight. With our first machine we made sixty-five miles an hour over the ice."

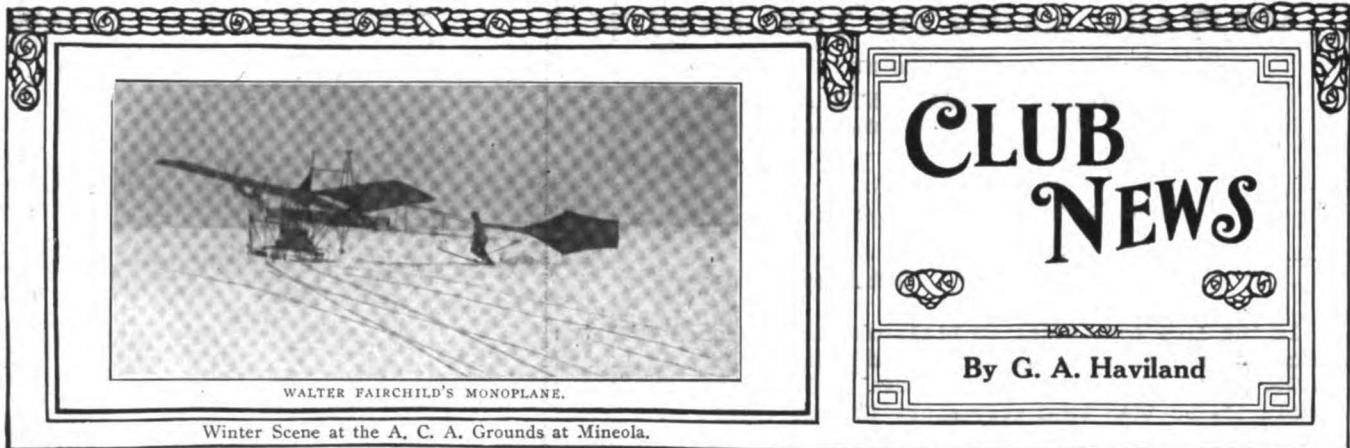
The Michigan Steel Boat Co.'s speed-product is thus intended to remain in close proximity to the surface of the water: it is a hydroplane with wings. The machine on which Curtiss recently rose from the water is an aeroplane filled with hydrophans and bears no relation to water-travel except when rising or alighting.



"THE FLYING FISH," AN AERIAL MOTORBOAT BUILT BY THE MICHIGAN STEEL BOAT CO. OF DETROIT.



GLENN H. CURTISS' HYDROPLANE-SUPPORTED BIPLANE ON THE SURFACE OF SAN DIEGO BAY; THE ONLY AEROPLANE IN AMERICA TO HAVE RISEN FROM WATER.



CLUB NEWS

By G. A. Haviland

Aero Club of America

BULLETIN OF FEBRUARY 1, 1911.

Eight names were submitted for resident membership and five for non-resident membership.

THE GORDON BENNETT BALLOON CUP.

Last year, the Aero Club of America won a second consecutive victory in the Gordon Bennett Balloon Cup race, with a third victory this year, the Cup would, according to the rules of the contest, become the property of the Club.

The occasion is accordingly taken to urge upon all pilots of the Club and of all Affiliated Clubs to make early preparation for this year's contest by which, it is earnestly hoped, America will retain the Cup forever.

At a meeting of the Executive Committee on January 31st, a motion to this effect was unanimously carried.

Although no official date has been decided on as yet, the race will probably take place on or about October 7th.

THE GORDON BENNETT AVIATION CUP.

The Aero Club is unofficially informed that the date for the Coupe Internationale d'Aviation Gordon Bennett Cup, has been set by the Royal Aero Club of the United Kingdom—the present holder—for the last days of June. (Coronation Week); the exact day will be announced shortly.

The Committee in charge of arrangements to select and to send over the Challenging team of the Aero Club of America has already made inquiries as to representative men and machines; a thorough and early preparedness being recognized as the greatest factor for success in the club's effort to regain the Cup, the method of selection and the full plan of action to carry the Challenge to a successful issue will be decided on at an early date.

RECORDS OF PILOTS OF THE CLUB IN JANUARY.

Although considered the worst season of the year for flying in most parts of the world, January, this year, showed the same steady advance in aviation as the months which preceded it.

Nearly all the record-breaking feats of the new year were achieved by pilots of the Club. On January 17th, in France, Henry Weymann (A. C. A. pilot-license No. 14), flew from Bouy to Reims and back (37 miles), carrying two passengers; he made two stops on the way. A few days later, Mr. Weymann made the same flight with three passengers—both performances being World's Records for passenger-carrying across country.

On January 18th, Eugene Ely (A. C. A. pilot-license No. 17), flew out to sea from Selfridge Aviation Field, near San Francisco, and landed on a platform built on the stern of the U. S. cruiser "Pennsylvania," this being the first time that an aeroplane has ever alighted on a vessel at sea. The difficulty of the feat was increased by the fact that the "Pennsylvania" was at anchor. Leaving the cruiser by air presented comparatively no difficulty after the successful performance of the historical feat, although the get-away was also made with the vessel at anchor.

This flight was made during the successful meet held at San Francisco, under sanction of the Club's National Council, from January 7th to January 22nd.

On the last day of the meet, Philip C. Parmelee (A. C. A. pilot-license No. 25), made a flight 3 hrs. 39' 48" in duration—a new American record. This record has previously been held, either officially or unofficially, by the following members of the Club: Wilbur Wright, Orville Wright, Louis Paulhan, C. B. Harmon, the late Ralph Johnstone, A. M. Welsh and the late Arch. Hoxsey.

On January 26th, Glenn Curtiss, winner of the first Gordon Bennett Aviation Cup-race and holder of the Club's first aviation pilot-license, succeeded in rising from the surface of San Diego Bay, California, in an aeroplane fitted with hydroplanes. This is the first time such a feat has been accomplished in America. A similar one was performed in France some months ago, by Fabre, of Mar-

seilles, but he did not meet with quite the same measure of success as Curtiss.

On January 30th, J. A. D. McCurdy, the president of the Aero Club of Canada (A. C. A. pilot-license No. 18), rose from the ground near the Terminal station at Key West, Florida, at 7.42 A. M., and steered S. S. W. across the Straits of Florida, with Havana as his destination. A leaking oil-tank compelled him to descend to the sea, two hours and seven minutes later, when within plain sight of the Cuban capital.

In this flight of about ninety miles, Mr. McCurdy broke all records for over-sea flights by twenty-five miles, and approximately equalled the American over-land straightaway record (89½ miles.) This is the first time a man has flown out of sight of land on a clear day; it is also a record duration and distance flight for a Curtiss biplane, and the first time one has flown for two hours.

G. F. CAMPBELL WOOD, Secretary.

On February 7th, Monday, October 9th, was selected as the date of the 1911 Gordon Bennett Balloon Cup race.

The Board of Governors of the Aero Club of America and the Executive Committee of the National Council held separate meetings on February 7th to consider the change of plans and scope of the work of the two organizations.

A committee of five was appointed by each body to outline policies to be considered by the two organizations at a joint conference to be held not later than February 25th. Representatives from the National Council include Robert J. Collier, chairman; James King Duffy, secretary; Jerome H. Joyce, Baltimore; Arthur Atherholt, Philadelphia; and Dr. John Eberhardt, Dayton, Ohio, and those from the Aero Club are Allan A. Ryan, Cortlandt F. Bishop, W. W. Miller, Major Samuel Reber, U. S. Army, and Lytleton Fox.

The Harvard Aeronautical Society

BY EDWIN C. BROWN, SECRETARY.

The Harvard Aeronautical Society is to hold the first Intercollegiate Glider Meet on the Harvard Aviation Field, Atlantic, Mass., on May 4, 5, and 6, 1911. Entries have already been received from Columbia, Williams, Pennsylvania, Tufts, Technology, Dartmouth, and Harvard, and others are expected from colleges now constructing machines. There is in construction a gliding slope on the field, and from this machines may be launched at various heights, thus testing thoroughly the efficiency of the different machines. The events will be distance, duration, height, and accuracy, and suitable cups are to be offered by enthusiasts of Boston.

At the present time there is on the field a permanent hangar to hold two large machines, and other temporary hangars will be erected for the meet. Entries should be sent to the Society at 34 Dana Chambers, Cambridge, Mass.

Aero Club of San Diego

Glenn H. Curtiss has signed a three years' lease of the island from the Aero Club of San Diego and arranged to establish permanent headquarters there.

The Aero Club of San Diego will erect several buildings for him, including quarters for a large force of mechanics and other workmen, new hangars, an assembling plant and machine shop, and will supply electric power from the city. The entire plant and outfit for the Curtiss government aviation school will be similar to that at Mr. Curtiss' headquarters at Hammondsport, N. Y., and Curtiss aeroplanes will be built there.

Tampa Aero Club

February 19, 20, 21 and 22 have been selected for the aviation meet at Tampa, Florida, during the Census Celebration. J. A. D. McCurdy, accompanied by Beachey, Post and Ward, will probably enter in the hundred mile race over water.

Springfield Aviation Association

Arrangements are being made to hold an aviation meet in Springfield, Mass., directly following the Boston meeting and preceding the New York meet. It is intended to offer a suitable prize to the aviators who will fly from Boston to Springfield and from Springfield to New York.

Aero Club of Connecticut

BY S. H. PATTERSON.

Mr. C. J. Lake of Bridgeport, Conn., father of Simon Lake, inventor of the Lake Submarine Torpedo Boat, has been working on an entirely new type of aircraft for a number of years, and has already obtained patents in this country; he is taking out patent rights in nearly every country where patents can be had. He states he has made arrangements to turn Nutmeg Park of Bridgeport, into an Aviation field, and that when his patents are protected in foreign countries he will be prepared to exhibit his machine when we get suitable weather in hte spring.

He claims that he has produced an aeroplane with inherent stability, which, while not capable of the speed of present biplanes and monoplanes, will be incapable of alighting at a dangerous angle, and will, at all times and without manoeuvring by the operator, remain on even keel.

Frank Payne, a Bridgeport boy who has built a Curtiss type biplane which he is now flying at Mineola, N. Y., expects to fly from Seaside Park in Bridgeport to Steeplechase Island and back, a distance of about five miles, on February 22nd. A purse is being made up in Bridgeport by business men to be presented to Mr. Payne in the event of his making this flight successfully.

W. C. Beers, of New Haven, Conn., vice president of the club, has ordered a Wright flyer to be delivered in May. Mr. Beers is one of the incorporators of the United States Aeronautical Company, for the manufacture of air-craft, which has been formed at Hartford with a capital of \$100,000. The other incorporators are, Clarence R. Hooker of New Haven; Charles E. Griffing, William H. Green, John W. Green, of Danbury, and John S. Curtis, of Erie, Pa.

The club will hold a meeting and a banquet at the Hotel Stratfield, on April 20th, and has extended an invitation to attend them to all inventors of air-craft or anything pertaining thereto, residing in the State. Should their invitations be considered practical by the club and the inventors be in need of financial assistance to perfect and develop their inventions, the club will be ready and willing to give them assistance.

It is expected by Spring, that several members of the club will have machines where with to popularize the sport of flying throughout the State.

Aeronautic League of New Jersey

BY WILLIAM A. KRAUS, SECRETARY.

The annual meeting of the Aeronautical League of New Jersey, was held on February 7th in Gathmann's Hall, Union Hill, when the following officers were elected: Cornelius De Bernardi, President; Charles Remond, Vice-President; W. A. Kraus, Secretary; L. Liverani, Financial Secretary and John E. Ring, Treasurer. The above officers were also appointed as a Technical Committee.

Models of various kinds of flying machines were exhibited and their good and bad points discussed at considerable length. Most of the officers and many of the members have had practical experience as bird-men, and at the present time three of the members have almost completed the construction of machines of their own. Two of them stated that just as soon as the weather permits they expect to be ready to fly.

The next meeting of the League is scheduled for February 21st, when the special feature will be a review of the history of aviation from the inception of the science up to the present time.

It was explained by the president that the meetings are open to all who are interested in aviation, and that they need not be men of practical experience in the way of navigating the air.

MILITARY NEWS OF THE MONTH

AS RECORDED BY

BRIGADIER GENERAL JAMES A. ALLEN
Chief Signal Officer of the Army

WAR DEPARTMENT,
OFFICE OF THE CHIEF SIGNAL OFFICER,
WASHINGTON.

My dear Mr. Lawson:

February 11, 1911.

In the Army appropriation bill, which has passed both the Senate and House and which is now in conference, there is an item of \$25,000 which is made immediately available for the purchase of aeroplanes, so that in a very short time we expect to buy such a number as this amount of money will pay for, obtaining well known, efficient machines of American make. An additional sum of \$100,000 will be available on the first day of July, and some time previous to that date, probably in March or April, we will undertake to purchase additional machines.

The Government has accepted from Mr. Robert J. Collier for temporary use his new Wright machine, which is to be sent once shipped from New York to San Antonio, and at the same time Mr. Collier is sending Mr. Phillip O. Parmelee to that point to report to Lieutenant Foulais to instruct him, and perhaps do some flying on the frontier.

Inclosed is a copy of a telegram from Mr. D. C. Collier President of the Aero Club of San Diego. The Department has expressed its appreciation of the service of Mr. Harkness in carrying the message, and has directed that he be given all proper assistance in connection with military work in the vicinity of San Diego.

Very sincerely yours,


San Diego, Calif.,
February 7, 1911.

Mr. Alfred W. Lawson,
Editor Aircraft,

General Allen,
Chief Signal Officer, U. S. A.,
Washington, D. C.

I have the honor to inform you that Harry S. Harkness, today flew from Aviation Camp on North Island opposite Fort Rosecrans, to the encampment of the U. S. troops on Mexican border near Tiafuana, carrying message from Major McManus, Commanding Fort Rosecrans, to his subordinate Lieut. Ruhlman, the flight was eminently successful entire distance covered 45 miles was in the air 56 minutes encampment of regulars 21 miles from Fort Rosecrans message was in hands of officer 25 minutes after delivery to Harkness roads between points practically impassible through recent rains.

D. C. Collier,
President Aero Club,
San Diego.

4:37 p. m.



J. A. D. MCCURDY WHO RECENTLY FLEW FROM KEY WEST, FLORIDA, TO WITHIN A FEW MILES OF HAVANA, CUBA, MAKING A WORLD'S RECORD FOR OVER-WATER FLIGHT.



CLAUDE GRAHAME-WHITE, THE WINNER OF THE GORDON BENNETT CUP, NOW DEFENDANT AGAINST THE WRIGHT COMPANY IN A SUIT FOR INFRINGEMENT.



SAM A. TICKELL OF NEW YORK IN A CURTISS TYPE BIPLANE OF HIS OWN CONSTRUCTION.

GENERAL NEWS

Harvey Crawford of Tacoma, Washington, has been making some successful flights lately in a biplane of his own construction in which he uses a 50 H. P. Call aviation motor.

The Detroit Aeronautic Construction Company, the builders of "The Aeromotor," have just entered into a three years' advertising contract for space in *AIRCRAFT*. Wise company this, and what is more, it shows stability.

Andrew Smith and Charles Augustine are the prime movers towards the organization of a company at Travers City, Mich., for the purpose of manufacturing aeroplanes and aero engines in that growing western town.

For tenacity of purpose and unique methods in introducing himself and ideas to the aeronautical fraternity, we must call attention to the advertisements of Joseph E. Bissell, of Pittsburg, Pa.

Charles Hilliard, who built a Curtiss-Burgess biplane at Mineola recently, made his first flight with it there on January 22. The machine rose to a height of 50 ft., circling the field three times. The following day ten trips were made about the field by the same aviator, several of them with Leo Stevens as passenger.

The Wright training school, in charge of Frank Coffyn, was opened on January 23rd, at Augusta, Ga. Two pupils reported for lessons, W. Starling Burgess, of Boston, and Geo. H. Manner, of Baltimore. It is expected that Robt. J. Collier of New York, will also become a pupil in this school.

From a practical standpoint, the San Francisco aviation meeting accomplished much. It has been proven that the aeroplane can be used by the army and navy with the utmost success, both in an informative and aggressive manner. Facts show that an officer can go aloft and with pencil, pad and field glasses, make accurate observations and that photographs can be taken at an altitude of 1,000 ft. In addition flights from shore to ship have been effected and it has been demonstrated that loaded bombs can be dropped accurately from a height of 2,000 ft.

Senator Spellacy of Hartford, Conn., has offered a resolution requiring owners of flying machines to file annual reports with the Secretary of State.

No flying machine shall be operated unless in charge of a person whose qualifications have been approved by the Superintendent of the State Police. This bill was referred to the Judiciary Committee.

On January 26th, Glenn H. Curtiss made a successful ascent from the water and after a flight of two miles over the bay alighted on the water at the point of starting.

The following day Mr. Curtiss made a second and longer flight, rising from the water to a height of 200 ft. and soaring over the bay for four miles, returning to his starting point on the water and alighting without even a splash.

These trips from the water are the result of experiments being carried on at San Diego by Curtiss and several others with a Curtiss machine equipped with hydroplanes.

At San Diego, a short but successful trip was made by Lieutenant Theodore G. Ellison of the United States navy. This, we believe, is the first trip made by an American naval officer.

Although the altitude of over 11,000 feet reached by the late Arch Hoxsey, was previously accepted as a world's record facts that have now come to light, prove these figures unreliable, owing to the fact that the barograph used in that flight had not been previously calibrated. Regrettable as it is, Hoxsey's brilliant flight counted for naught.

Experiments with a combination aeroplane and dirigible are being made at San Antonio by Lieut. H. E. Honeywell, with some degree of success. Trips of from 8 to 30 minutes have been sufficient to demonstrate the "non-capsizeable" qualities of this new type of flyer, which by the way is named "Diriplane."

Lieut. John Rodgers was lifted 400 ft. from the deck of the cruiser *Pennsylvania* on February 1st, by a train of eleven man-lifting kites. Whilst suspended Lieutenant Rodgers made observations and signalled results to officers aboard the ship.

A small group of aeronautical enthusiasts, with Friable and Purnes as aviators, are expected to arrive at Baton Rouge, La., the latter part of February to give exhibition flights.



REPORTING ON THE STRENGTH AND POSITION OF FIELD ARTILLERY AS SEEN FROM AN AEROPLANE DURING THE SCOUTING TESTS AT SAN ANTONIO RECENTLY.

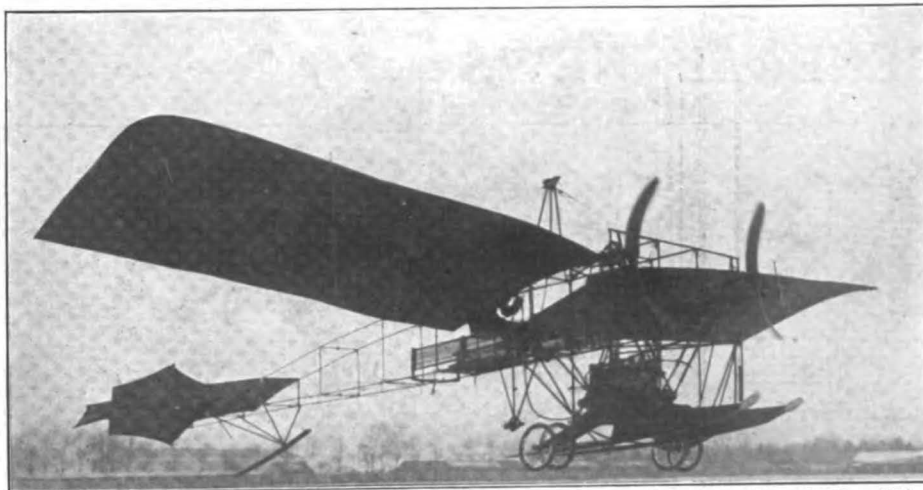
Reading from right to left Roland Garros, René Simon, René Barrier, Lieut. Foulis, U. S. Army, P. L. Young, General Manager International Aviators and Edward J. McCormack, press representative, International Aviators.



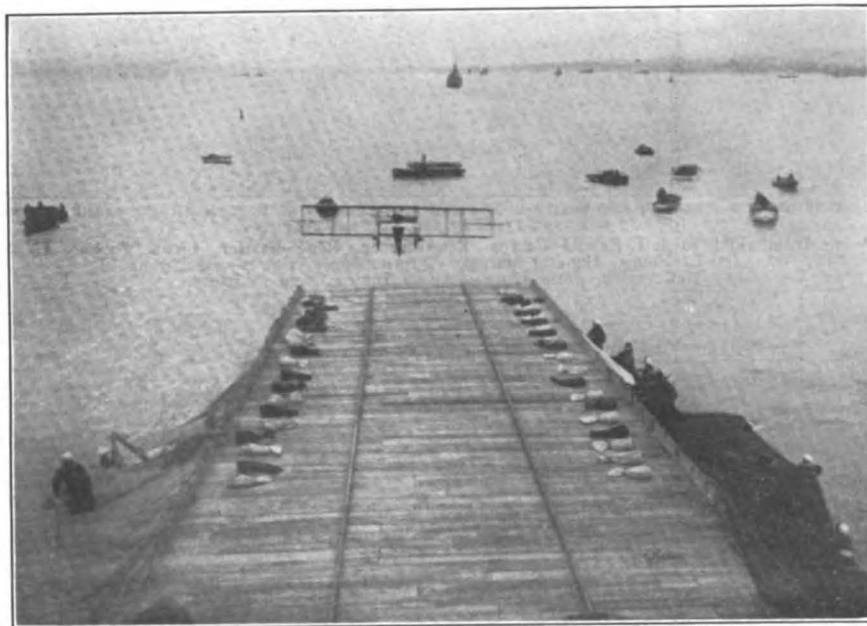
GLENN H. CURTISS AT THE WHEEL OF HIS LATEST BIPLANE.



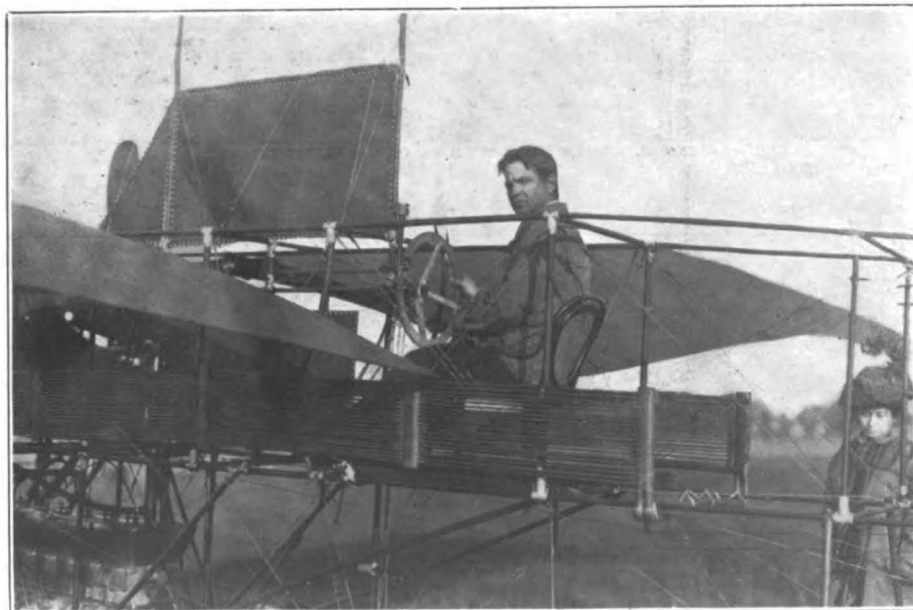
CURTISS' MACHINE BEING TOWED ONTO SAN DIEGO BAY.



START OF A FLIGHT OF THE FAIRCHILD MONOPLANE AT MINEOLA PILOTED BY FRANK SCHUMACHER. THE MACHINE IS DRIVEN BY A 6-CYLINDER, 100 H. P. EMERSON ENGINE.



ELY ABOUT TO ALIGHT ON THE "PENNSYLVANIA"—THE FIRST AEROPLANE-LANDING EVER MADE ON A VESSEL AT SEA.



WALTER LOWE FAIRCHILD AT THE WHEEL OF HIS TWIN-PROPELLER MONOPLANE. THE PICTURE SHOWS CLEARLY THE POSITION OF THE EMERSON ENGINE, WHICH IS PLACED LOW WITH THE IDEA OF OBTAINING STABILITY. A DESCRIPTION AND DRAWING OF THIS MACHINE FIGURE ON PAGE 154, VOL. I.

An original monoplane is being built at Long Beach, Cal., by H. J. French. It will embody some hitherto untried methods of balancing and guiding. A 35 H. P. Holbrook motor has already been installed and tried out.

Men who have taken the Aeronautic Course at the West Side Y. M. C. A. have organized themselves into the Aeronautical Alumni Association. These men are making experiments, each carrying out his own ideas as to the proper method of airship construction.

Mr. A. G. Marquis, of Rochester, N. Y., is the inventor of a new stationary and vertical dial indicating compass, for use on aeroplanes, which will prove a very valuable acquisition in aerial navigation.

Henry J. Winter and Francis J. C. Ferris, of New York, have organized the International Aeroplane Manufacturing Co., and intend starting in the manufacture of aeroplanes shortly.

Washington will have its first national aeronautical exposition from March 5 to 12, inclusive. The exhibit will be held in Exposition Hall, one of the largest buildings in the country, which has just been completed at M and North Capitol streets.

The answer of Claude Grahame-White, defendant in an infringement suit instituted by the Wright Company, was filed February 6th in the United States Circuit Court. Grahame-White denies that Wilbur Wright or Orville Wright was the original inventor of a new and useful invention in flying machines.

The answer also asserts that the patent issued to the Wright brothers is void, because the alleged invention or discovery, owing to the state of the art of flying at the time that application was made, and for a long time prior thereto involved nothing more than the exercise of mere mechanical skill, and for this reason was not a patentable novelty.

For these and other reasons Grahame-White asks the Federal Court to dismiss the complaint.

Announcement is made that the War Department will soon advertise for bids for twelve aeroplanes to be used by the new corps of military air navigators which the Government expects soon to organize. Brigadier-General James Allen, chief signal officer, gave out the news after he appeared before the Senate Committee on Military Affairs and made a plea for the item of \$125,000 for aviation experiments carried in the army appropriation bill.

"It is my intention," General Allen said, "to establish a number of aerodromes or hangars. One is to be near Washington, probably at College Park. We already have one at San Antonio, Tex., and we shall establish one at Fort Leavenworth, Kan., and one in Southern California."

"The latest bid we had from the Wrights was one of \$5,000 for each aeroplane. We have never had a bid from the Curtiss concern, and the report that Curtiss is coming to Washington to organize air scouts for the War Department is not true. I expect that the Signal Corps will do that, and pretty soon."

"It is likely that we shall soon ask for more officers for aeroplane work. We now have two men detailed with Curtiss in California."

The Goodyear Tire and Rubber Company have put upon the market a new rubber coated fabric for aeroplanes which they claim is stronger than silk and will not stretch or shrink.

The Goodyear Co., have apparently come into aeronautical trade to stay as they also manufacture a high grade detachable aeroplane tire and are going after business in a most energetic and convincing manner.

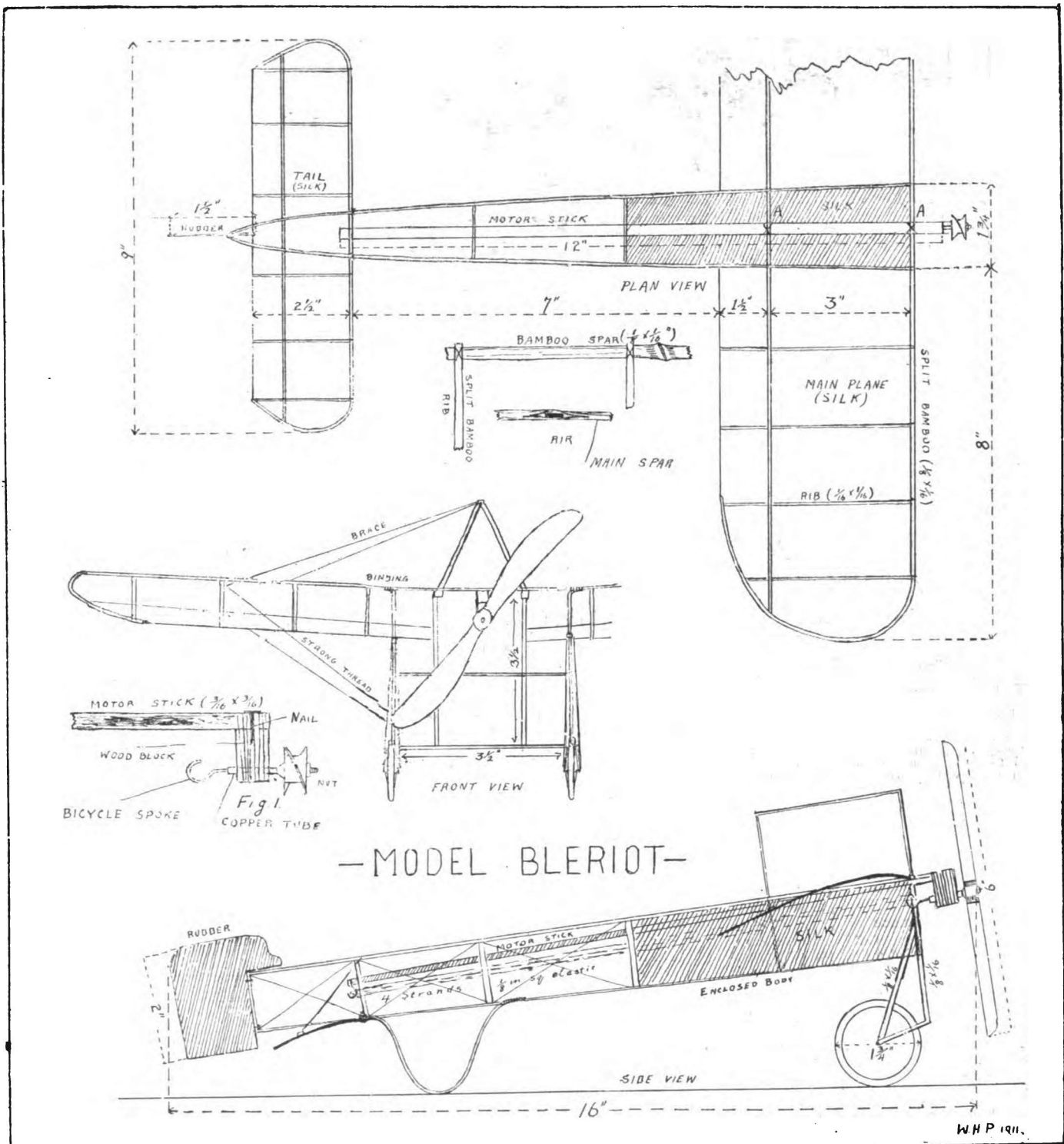
The Wright Company announces that the Burgess Company and Curtis of Marblehead, Mass., have entered into an arrangement with them whereby they secured a license for the use of the Wright patent in all of the aeroplanes which they produce. These machines may be used for sporting purposes only, under the same sales arrangement on which the Wright Company sell their own machines. The license for profit may be secured on the same terms as purchasers of their own machines.

On February 16th an attempt was made to fly across the Hudson River from Guttenberg, N. J., to New York. It was the intention of the aviator to alight in Central Park near Columbus Circle; his engine failed, however, while he was over the river. He was up high enough to glide to land on the Jersey side, but preferred to come down on the water; he was picked up by a passing tug, escaping with nothing worse than a frigid drenching; the machine sank, but will, it is expected, be salvaged.

It is hard to see what there is to gain by such a feat as this; one can afford to disregard as harmless the craving for notoriety of a certain class of showmen-aviators as long as it does not endanger the rest of humanity, but such is not the case in the attempt to get into the public eye referred to above. A flight over New York might possibly be attempted at a great height at this period of the art by an experienced flyer, the capabilities of whose machine were known to be such as to accomplish the feat successfully, but even in such a case an attempt to land in the city could only be looked upon as a piece of reckless and criminal folly. As it is, the attempts being made in this direction should certainly be stopped before they hurt the cause of aviation.

CONSTRUCTION DRAWINGS OF A BLÉRIOT MODEL

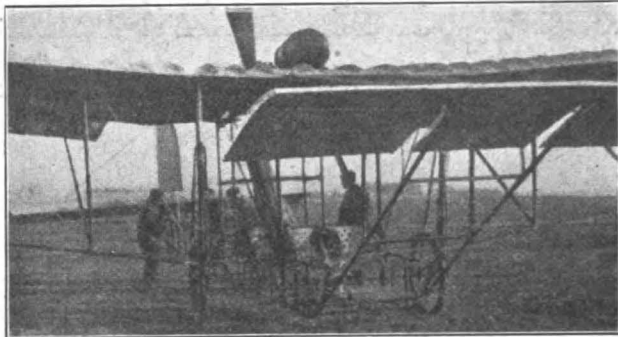
By W. H. Phipps



A SUCCESSFUL BLÉRIOT MODEL

To construct the model illustrated in the above drawings procure the following materials: Several strips of small split bamboo about $\frac{1}{8}$ inch thick and three feet long. These can be split up to the desired sizes and lengths given in the drawings. For the motor get a small stick $\frac{3}{16}$ inches square and 1 foot long, a small wood block and some copper tubing for making the bearing shown in fig. 1. The motor-stick is fastened in the frame only at the two points marked A in the upper drawing, and the elastic is to be stretched between the bearing hook and the rear hook as shown.

The other materials necessary are: One yard of light China silk, some fine wire, a spool of thread, a small pot of glue and two small wheels.



A FRONT VIEW OF THE NEW FOUR-SEATER BLÉRIOT, WHICH RECENTLY CARRIED EIGHT PEOPLE.

FOREIGN NEWS

By D. E. Ball

Cuba

Cubans who previously had only witnessed the flights by André Bellot, are nowadays seeing a great deal of flying. The Curtiss aviators, McCurdy, Ward, Beachey and Russell, gave a series of exhibitions at Camp Columbia, near Havana, from January 28th to February 7th, at which McCurdy proved to be the star, but where several good flights by Ward were also made.

McCurdy's great flight from Key West over the Straights of Florida occurred on January 30th. Its place in aeronautic history as a record-breaking feat is shown in the Aero Club of America's Bulletin of February 1st, published elsewhere.

The newly formed Aero Club of Cuba is planning a meet on a large scale for the first fortnight in March. The Moisant aviators (Simon, Barrier, Garros, Audemars, Hamilton, Frisbie and Seymour) will be there, and it is hoped that several Wright and Curtiss flyers will also attend. A prize was offered for a flight from Columbia Field to Havana Harbor and back, including two circuits of Morro Castle, to be tried for any time during February; the feat has already been successfully accomplished by McCurdy.

England

At the annual banquet of the Royal Aero Club of the United Kingdom, which took place on the last day of January, several important prizes were presented, including the \$5,000 cash prize which goes to the winner of the Gordon Bennett Aviation Cup, won last year by Grahame-White, and the Baron de Forest prize of \$20,000 for the longest straightaway flight (including the crossing from England to the Continent) on an all-British machine in 1910, which was won by Sopwith (with 169 miles), and the British Michelin Trophy and \$2,000 prize won by Cody.

On the day after the banquet, Sopwith flew from Brooklands Track to Windsor at the invitation of the King. He stopped at Datchet on the way and before landing on the Castle grounds in the presence of King George, circled the historic tower. The machine used was a 60 H. P. Howard-Wright biplane, similar to that in which he won the DeForest Prize.

France

Perhaps the most notable feat to occur in France during the first month of 1911, was Roger Sommer's 20 minute cross-country flight at Douzy on January 28th, carrying five passengers besides himself. The lightest passenger weighed 106 lbs., and there seems no doubt that in this instance a heavier-than-air machine carried in flight a load greater than its own weight.

A few days before, Henry Farman had broken Bréguet's weight-carrying record of 923½ lbs. by carrying five passengers weighing 929 lbs., but all these feats were overshadowed on February 2nd, when Théodore Lemartin the Blériot driver, took up seven passengers besides himself on the new 100 H. P. four-seater now at Pau. The load carried was about 1,100 lbs. Because of the larger engine used his performance is no doubt not as meritorious as Bréguet's; it is certainly impressive, however, seeing that very few self-propelled road-vehicles carry more than seven all told.

This new machine is different from anything hitherto constructed by M. Blériot, inasmuch as it is fitted with a front elevator and a rear propeller. The 100 H. P. Gnome motor is situated on top and at the rear of the main planes, while the passengers sit below as on the old Blériot XII.

Bathiat, who formerly drove a Bréguet biplane, is now piloting a Sommer monoplane. On January 15th he made a remarkable straightaway flight of 68 miles in 52 minutes. He had, of course, a strong wind to help him; its exact velocity is not stated but in any case the excellence of the machine was proven either for speed or for stability, according to whether the wind was light or strong.

Another new monoplane which is beginning to make history is the two-seater Déperdussin. On January 11th, Vidart left Mourmelon on one of these machines with his friend Galliard and flew to Rheims. This pilot and this machine held at that time the world's record for speed for a two-man flight (50¼ miles per hour).

On February 13th Busson flew on one of these swift monoplanes, with a passenger 100 kil. in 1 hr. 1'—the same time as that in which Grahame-White won the Gordon Bennett Cup on his 100 H. P. single-seater!

Emile Aubrun has been continuing his work with the Morane monoplane. On January 18th, he was flying for about an hour and a half and the following day for a further half hour. He expects to shortly make an onslaught on existing speed records.

Henry Weymann's passenger-carrying feats across country on January 17th and 22nd, are referred to under Club News in the Aero Club of America's Bulletin of February 1st.

At the Hanriot School on January 23rd, Lieut. de Grailly, at his fifth lesson, flew for 30 kiloms. across country, passing over Bétheny and Vitry. The builder M. Hanriot, father of Marcel Hanriot, was also flying, and in the course of one of his long trips made use of the clock tower at Bétheny as a mark-post.

At Juvisy on January 26th, Védrine made a flight on a Goupy of 2 hrs. 24',—a record for this interesting biplane, a picture of which occurs on page 253 of Volume I of AIRCRAFT.

On January 5th, the aviation pilot licenses issued by the Aero Club of France numbered 354, of which 327 were granted in 1910; 188 licenses were obtained on biplanes and 166 on monoplanes. Of these 354 aviators, fourteen, or slightly less than four per cent, met their death as a result of aeroplane accidents; nine of these were French and five of other nationalities. Of the 340 now flying 263 are French and 77 of other nationalities; these 77 include Peruvian, Brazilian, Chilean, Uruguayan, Rumanian, Turkish, Australian and Japanese aviators. A large number of men of other nationalities also passed their tests in France, obtaining licenses from their home clubs.

The 1911 rules for the Coupe Michelin have just been published in Paris. Distance remains the standard whereby the trophy will be awarded, but otherwise the rules are radically changed.

The Cup will be competed for across country, two points, 50 or 100 kilometres apart, being selected as turning points—only complete circuits to count—and stops will be allowed, the minimum average speed to be maintained being placed at 50 kilometres an hour for each and every circuit made. The flights may not extend over twenty-four hours.

The speed of the aeroplane and the endurance of the aviators thus become the prime factors for success in this competition.

On December 21st, Legagneux covered over 500 kilometres under six hours. In the thirty-two hours intervening between 7.30 a. m., December 29th and 3.30 p. m., December 30th, Tabuteau was flying for a total of over thirteen hours in two flights. These two feats show the possibilities of the 1911 Michelin Cup Competition. Searchlights will no doubt be carried on the aeroplanes for the circuits which will be made at night.

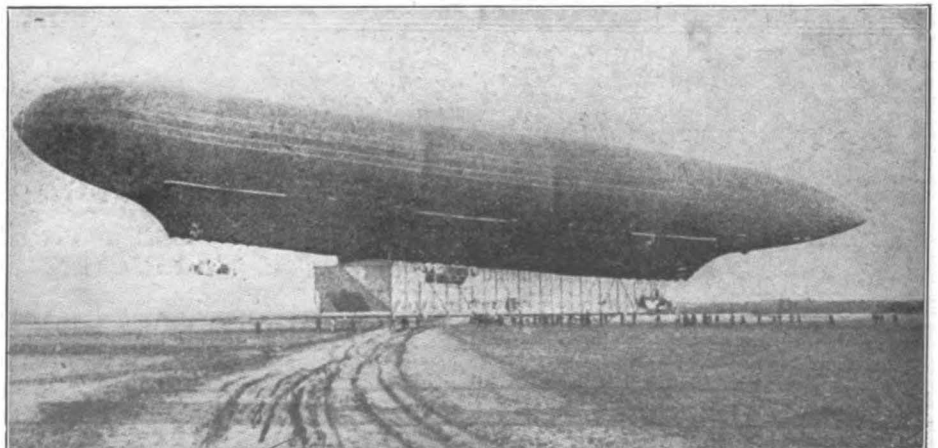
A competitor is not allowed to change his motor, his propeller or the cloth of his planes; seals will be affixed to these parts to identify them.

Realizing that the tests imposed by the Aero Club of France upon applicants for pilot-aviator's certificates are not very severe, General Roques, the head of the French Military Aviation Department, has drawn up a list of four tests, which will be required of those officers seeking to qualify for aviation duties. They are:

- 1 A flight of more than 100 kiloms. across country.
- 2 A flight of more than two hours' duration.
- 3 A flight at a height exceeding 300 metres.
- 4 A flight in a wind blowing at a rate exceeding 10 metres per second.

At the present time 14 military and two naval officers have fulfilled these conditions. They are as follows: Captains Bellenger, Sido, Marconnet, and Marie; Lieutenants Cammerman, Féquant, Rémy, Aquaviva, Crosnier, Chevreau, Maillols, Mailfort and Letheux; Adjutant Ménard and Naval Lieutenants Biasson and Delage.

The first days of February saw the first of the great cross-country raids for which the year will no doubt be notable. Capt. G. M. Bellenger of the Aviation Corps, left the military aerodrome at Vincennes on the outskirts of Paris, at 8.45 a. m., February 1st; eight hours and twenty-two minutes later he landed at one of the Bordeaux aerodromes having made two stops en route for gasoline. On the next day he went from Bordeaux to Pau in a



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single two-hour flight. The distance from Paris to Bordeaux by air is around 330 miles; Pau is 140 miles further.

The first fatal accident to occur in France this year happened at Douai on February 9th. The victims were André Noël, pilot, and Delatorre, passenger.

The wings of their monoplane collapsed when planing down at the end of a test-flight made before military authorities.

Germany

A large number of German aeronautical designers have joined together to form a society of aeroplane dealers and contractors and have petitioned the German Government to establish an official aeroplane department in connection with the Imperial Patent Office.

Lieutenant Stein of the German military aviation service, was killed on February 6th, while making a flight at Doeberitz. When at an altitude of about sixty feet the motor of his Wright biplane stopped and he was unable to negotiate a successful glide to earth.

On January 23rd, Grade attempted to fly one of his monoplanes from his works at Bork, near Berlin, to Madgeburg. When, however, he reached Belgig, about 30 miles from Berlin, he experienced trouble with his motor and planed down slowly from a height of 2,000 feet. An investigation showed that the oil had frozen in the pipes owing to the extreme cold.

India

At Calcutta, Baron Pierre de Caters and Jules Tyck have been making flights on Farman and Blériot machines respectively, while at Allahabad, Pecquet and Keith Davies have been giving exhibitions on their Humber machines, Pecquet using a biplane of this make and Davies a monoplane.

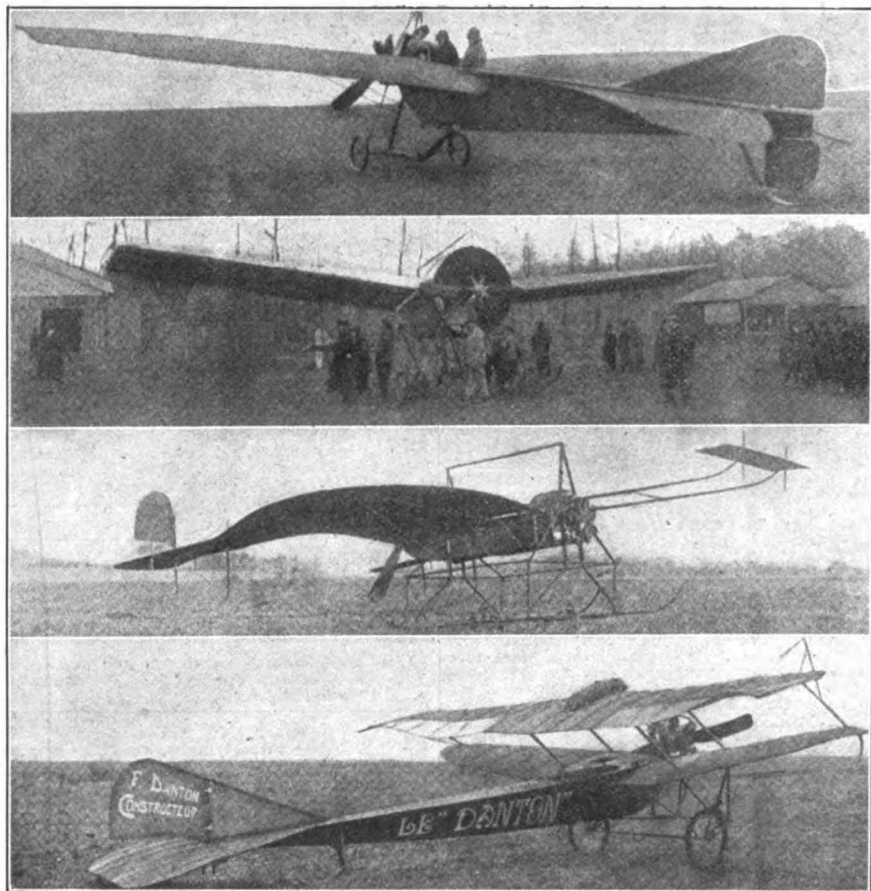
Italy

The new Italian dirigible "Ansonia II," built by Signor Picoli, accomplished a very satisfactory trial trip on January 20th, cruising from its shed near Verona across the Lake of Garda to Montichiari.

Peru

The first flights to be made in this republic were undertaken recently by Jean Biélovucic, the Peruvian who has so successfully piloted Voisin biplanes in France.

On January 22nd, he flew from Lima to Callao at a height of 200 ft. and on January 23rd, passed over Lima at a height of 1,800 feet, creating much excitement among the people. His fame is now but little inferior in Peru to that of his immortal countryman, Georges Chavez.



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(A) The new R. E. P. two-seater, in which the passenger sits behind the pilot. (B) The Jourdan monoplane. The pilot sits below the cylindrical centre, which is open, but tapers slightly towards the stern. (C) The Schraeck monoplane, with backward extending wings like an exaggerated Weiss. On each wing tip is an elevator and rudder, and there is an elevator forward, but no tail. The "Bread and Butter-fly." (D) The Danton biplane, a kind of biplane Antoinette.

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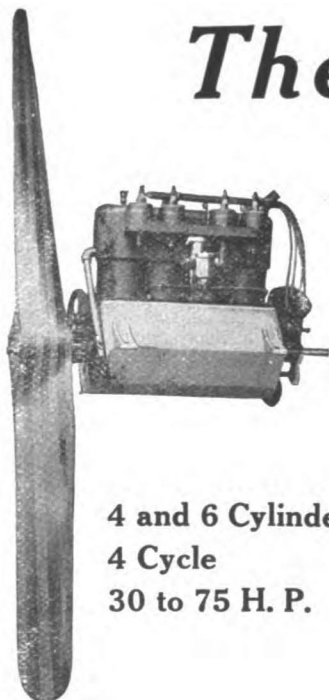
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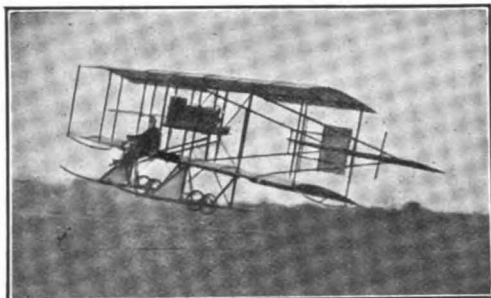
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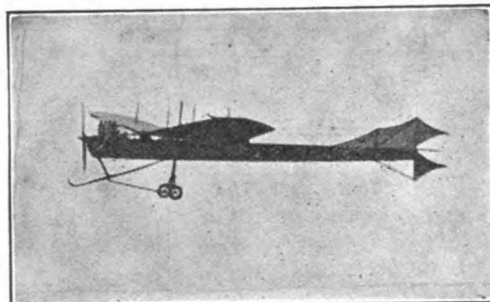


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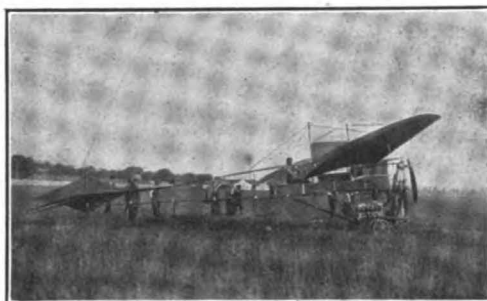
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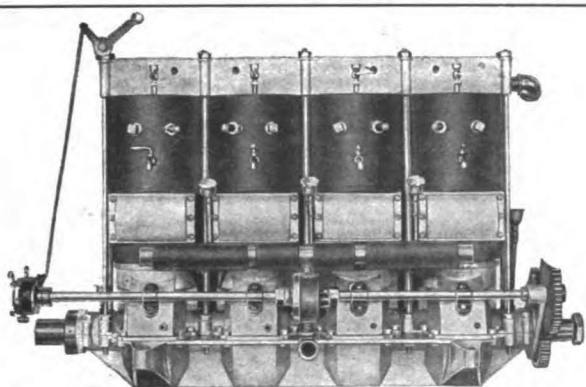
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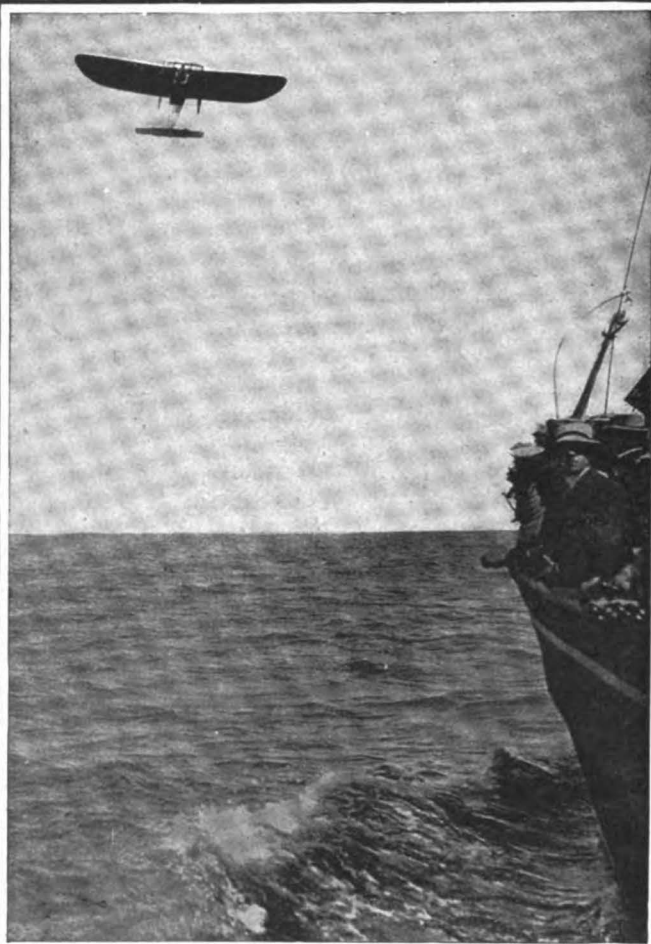
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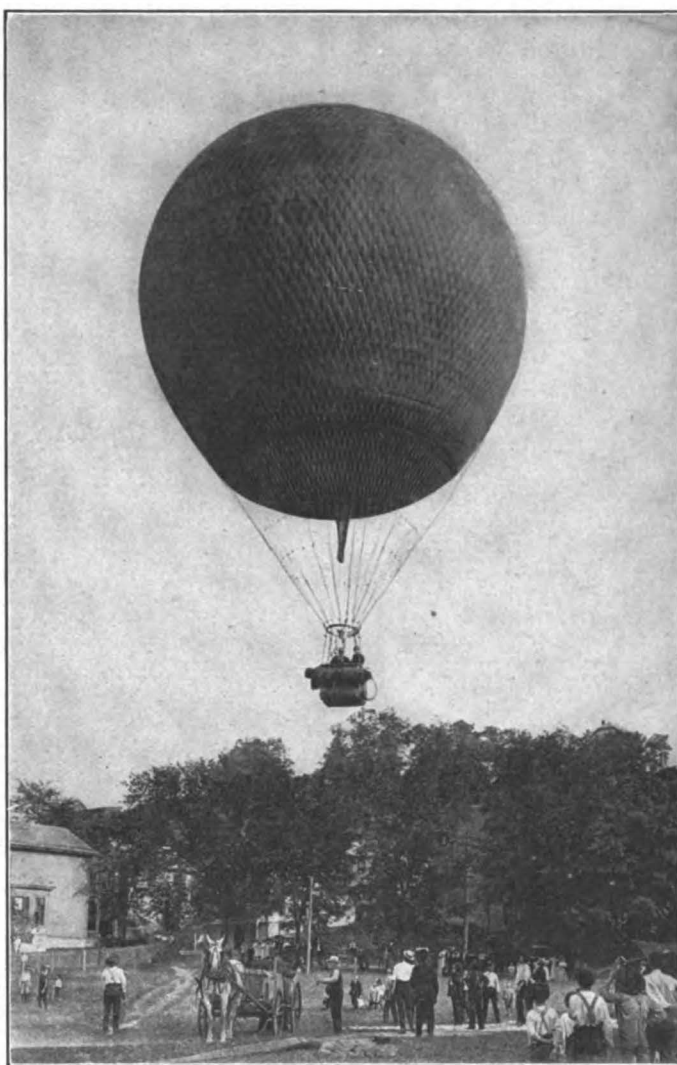
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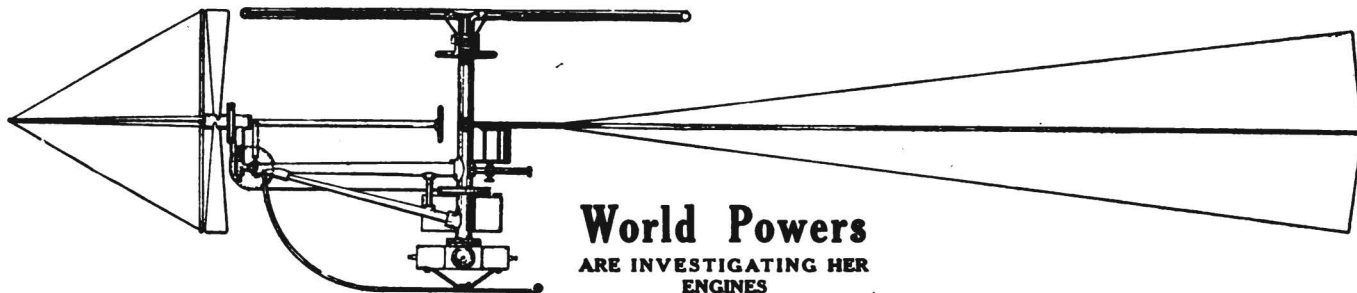
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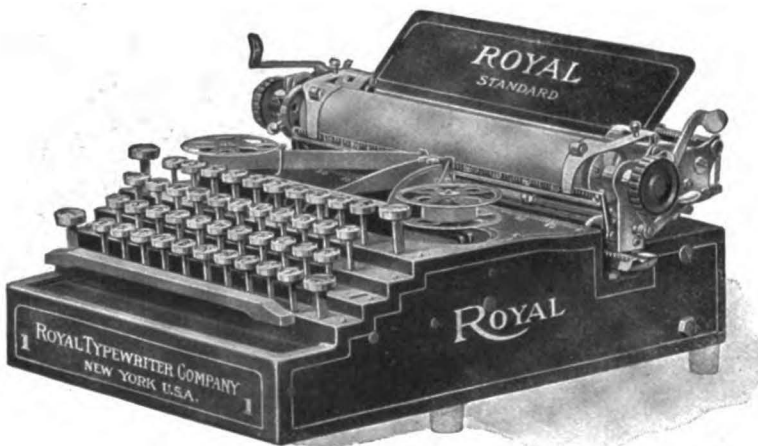
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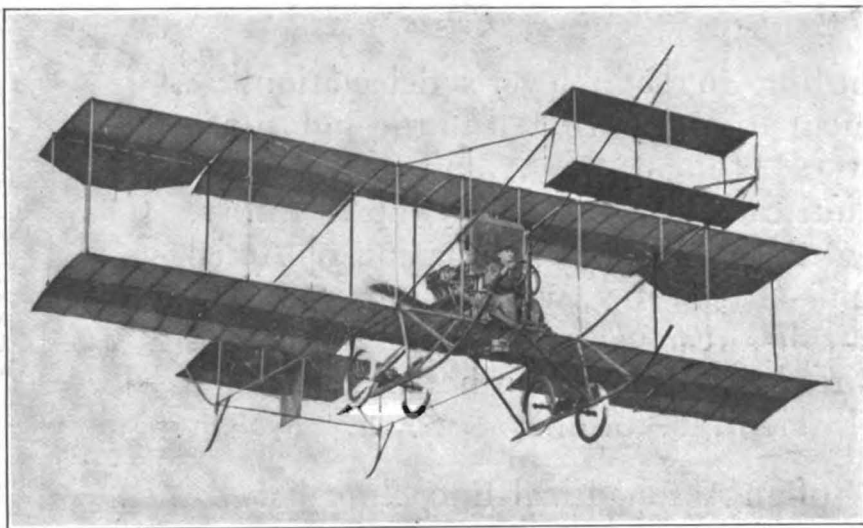
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SCO CALL. SUNDAY. JANUARY 22, 1911.



FRED E. WISEMANN IN FLIGHT, SAN FRANCISCO MEET

WISEMANN was the only prize winner out of at least six entries having home built machines. In competition with Beachy, Robinson and Walker, who flew Curtiss planes, already set up for them by mechanics of the Curtiss camp, he qualified in the half mile straight flight, the circular flight, and won first place in distance and duration, second in speed, and third in altitude.

Hall-Scott complete power plant was used, consisting of 60 H. P., eight cylinder, Type A-2 motor, 60 H. P. light weight radiator and a standard 8-foot propeller, variable pitch.

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RADLEY PLANS RECORD FLIGHT

English Aviator Will Attempt to
Make Trip to San Jose in
39 Minutes

Frederick Wiseman of Santa
Rosa to Join in Garden
City Performances

San Jose and San Francisco are to be linked in a record aeroplane flight next Saturday, if James Radley, the English aviator, finds the weather at all agreeable. The British birdman and his Bleriot monoplane will remain at Selfridge field until Saturday, and at 1:30 o'clock start for San Jose. After his arrival there Radley, assisted by Frederick J. Wiseman, the Santa Rosa aviator, in his original biplane, will give exhibition flights Saturday and Sunday afternoon.

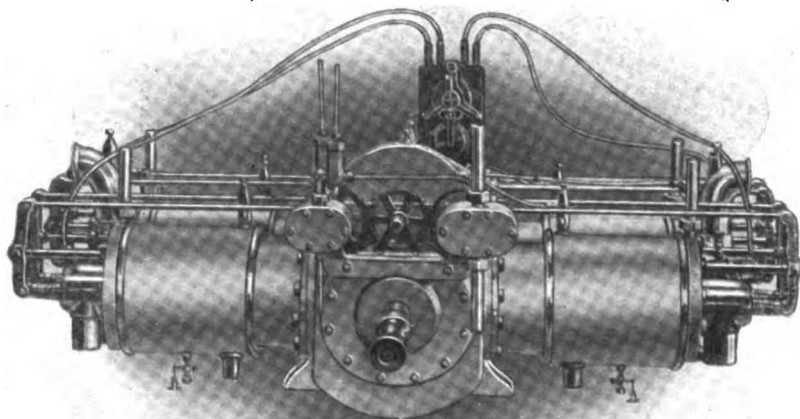
The San Jose rose carnival committee, the San Jose chamber of commerce and the Santa Clara Valley area club are financing the flying. Radley has taken Wiseman under his wing as "the most promising amateur he ever saw," and the young Californian will take a prominent part in the meet at San Jose. Indeed Wiseman will be the sole attraction Saturday afternoon until Radley comes buzzing on the scene. Then both aviators will do fancy flying together during that and the following afternoon.

The Englishman has set his heart on making the 40 miles between Selfridge field and San Jose in 39 minutes, which would be a record even for the swift flying Bleriot. As Radley flew a straight mile at Lanark, Scotland, at the rate of 77.6 miles an hour, he believes he can make the record here.

Wiseman has a biplane of California make and idea. It is said that his craft bears most resemblance to a Farnam biplane, but it is original in control and equipment. The Californian had made many successful flights with his machine in Sonoma county and two very good flights at the meet now in progress. He is pronounced to be an expert in aviating and eligible, so far as skill goes, to the professional class.

THE CALL AVIATION ENGINE

STANDARD OF LIGHT WEIGHT MOTOR EXCELLENCE.



TACOMAN FLIES IN OWN AIRSHIP.

(From Tacoma Sunday Ledger, January 22, 1911.)

"Nerved by 11 years experience as a professional balloonist and parachute jumper, Harvey Crawford, 23 years of age, thrilled between 300 and 400 spectators at Lakeview, yesterday morning with three successful flights in the first "Made in Washington," also "Made in Tacoma," aeroplane that has thus far been able to get off and stay off the ground.

Traveling at a speed he estimated at between 40 and 50 miles an hour, young Crawford flew a mile and a half at an elevation of 100 feet on the first attempt; two miles at the same elevation on the second attempt; and two miles and a half at an elevation of 200 feet on the third flight.

The engine is a 50 horsepower Call aviation motor, two cylinders, double opposed, and weighing 200 pounds. It is connected to a wooden propeller 6 1/2 feet in diameter and revolving 1,600 to 1,800 times a minute when the motor is running normally. The gasoline tank has a capacity of 10 gallons."

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We thank you for the extra effort made by you on the engine, and will gladly answer any inquiry on behalf of the Call Motor.

Yours very truly,
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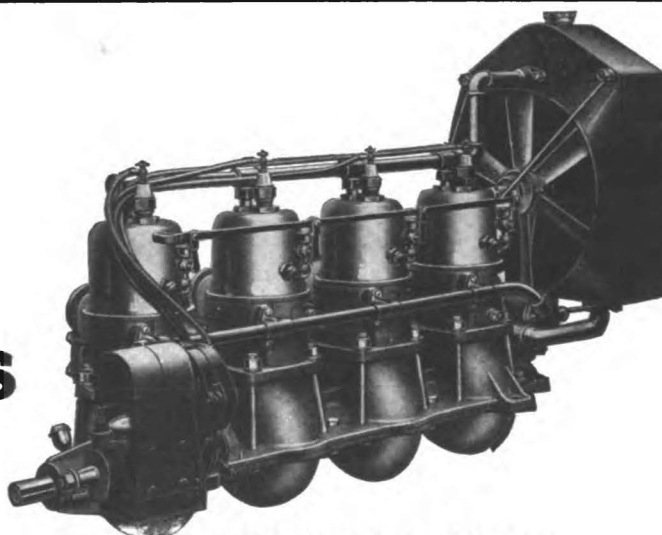
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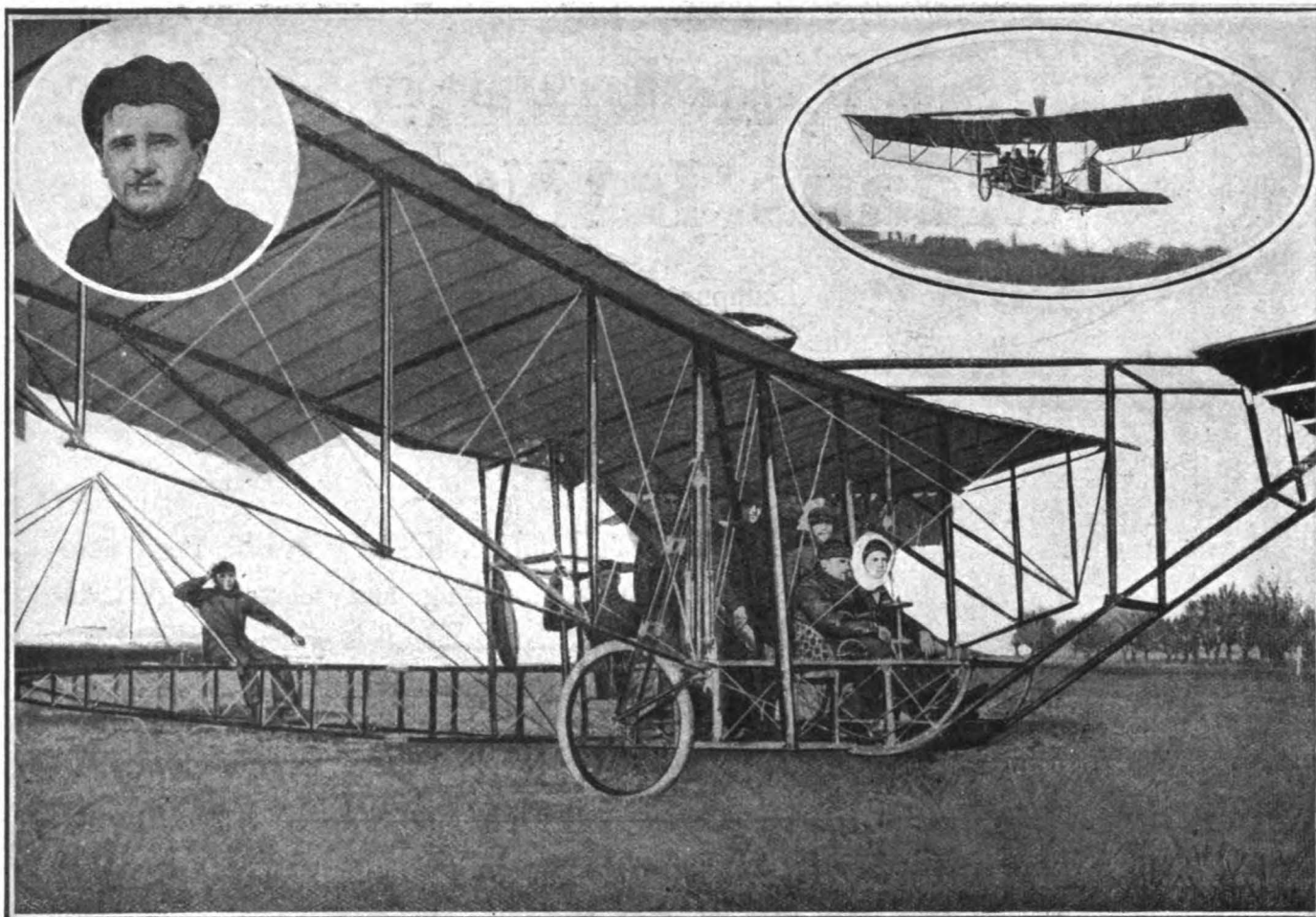
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The Aerobus has actually arrived. After the passenger carrying feats of Weymann, Breguet, Farman and Sommer, it remained for Lemartin to accomplish, on February 2d, a flight of eight minutes with eight passengers. On the left Lemartin; on the right, the machine, a Blériot, in flight.

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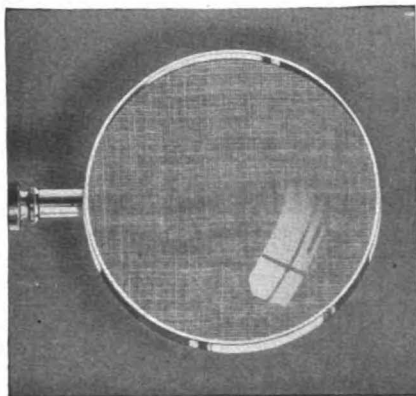
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