

AIRCRAFT

Vol. 2, No. 11

JANUARY, 1912

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THE LATEST TYPE BURGESS HYDROAEROPLANE IN FLIGHT OVER THE
MARBLEHEAD HARBOR

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15 CENTS A COPY
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THE MARINE AEROPLANE

By Henry A. Wise Wood

IT is not generally known that but for the breaking of a dam, near Dayton, Ohio, the first power-driven man-carrying aeroplane would probably have arisen from water instead of from land. The Wrights were preparing to carry out their experiments afloat, and one day launched their apparatus on the river. The following night its dam gave way—and the development of the hydraeroplane was left to a later investigator. Had the Wrights persisted with their water work, and success resulted, the subsequent course of the progress of aviation would undoubtedly have been changed; fewer lives would have been sacrificed, the writer believes, and the sport of flying would have been much further advanced at the close of 1911 than in reality it is.

Since Curtiss put water-flying upon a practical basis, enough has transpired to permit us now to form a somewhat correct estimate of the possibilities of the marine aeroplane. In doing this the following summary of its achievements will be of assistance: Curtiss arose from the water, alighted beside a battleship, and was successfully hoisted aboard. Being put overside he promptly got into the air again, and returned to his starting point. With wheels attached, he went under power from his shed into the water, and from the water into the air; alighting on the water he returned over the beach to his shed. Recently, without the aid of wheels, Curtiss successfully launched his machine from a three-cable runway, rigged as if from the foremast to the bow of a ship, and proved that a practical device is at hand by means of which the hydraeroplane may be instantly put to work by the Navy.

Flying together, in the U. S. Navy's hydraeroplane, Lieutenants Ellyson and Towers have gone long distances at great speed in moderately heavy weather, and have landed through heavy seas. On October 25th they flew 112 miles in 122 minutes, and came safely ashore through a six-foot surf, with a twenty-mile wind astern. Continuing their journey, Ellyson and Towers covered thirty-five miles in twenty-five minutes—with a thirty-mile wind off the port quarter—and successfully beached their machine through an eight-foot surf. This cost only a split hull-bottom, which was quickly patched with tarred canvas. In this landing, Ellyson states, Towers and he came ashore at the rate of eighty miles an hour, striking the tops of the waves with great force. On October 19th Hugh Robinson, in a similar machine, flew from Lake Calhoun, Minneapolis, to Winona, Minn., 110 miles, at the rate of eighty-eight miles an hour. Flying thence, along the Mississippi River, he collected and distributed mails over a route 300 miles long. Previously, in Puget Sound, Robinson had carried out some interesting manoeuvres in rough water with his Curtiss hydraeroplane. In a twenty-five-mile wind he was able to run in the trough of the sea, each lower wing-end cutting the top of a wave, and by turning slightly to windward successfully to rise into the air. In illustrating the facility with

which the marine aeroplane may be handled, Robinson states that to make a short turn, while upon the water, he has only to set his rudder and dip a wing, when the machine will instantly come about, using its submerged wing-end as a pivot. Curtiss, Ellyson, and Robinson all report the absence of difficulty in rising from heavy seas; which, of course, is easiest done against the wind.

Its great speed afloat is another remarkable characteristic of the marine aeroplane. With his standard hydraeroplane, having a seventy-five horse-power engine, and a 125-pound boat, Curtiss has made fifty-six miles an hour on the water, and from sixty to sixty-five in still air. At fifteen miles his boat mounts the surface, and at forty-five it answers the elevator, and clears. The weight of this machine, without wheels, is 900 pounds; its engine makes 1,200 r. p. m., and delivers a thrust of from 450 to 500 pounds. It is fitted with a starting crank, which may be worked from the "deck" of the machine, and has a "shift" control, which may be used by either of two persons seated side by side.

In considering the prospective evolution of the marine aeroplane it must not be overlooked that there are two schools of constructors already in the field. Curtiss, the originator of the single-hulled type, is convinced that he has chosen the line of development which is destined to survive; while others, Fabre, the Wrights, Starling Burgess, Voisin, and Roe seem partisans of the double-hulled type. The Curtiss, with its short wing spread, can perhaps afford a narrower floating base than the wider Wright, Fabre, or Voisin machines, with the resulting advantages of a single float, a few of which are simplicity, lightness, and manoeuvring facility. A careful study of both types has led the writer to prefer that of the single hull, and to agree with Curtiss in his belief that the normal development of the marine aeroplane will be along the lines of the boat, rather than of the catamaran. The second step upon this path has, in fact, already been taken by Curtiss, who has wisely inverted his previous conception of the hydraeroplane. To him it no longer is to be a floating aeroplane, but a flying boat. He is thinking from the water up, rather than from the air down. To this end he has already constructed a rather comfortable scow-like hull, in which sit pilot and passenger; while, from a position astern of them rises the wing-bearing structure, and in this, well aloft, is the power-plant. From this to a longer and still more roomy hull, in which is housed the power-plant, with its communicating chains, or shafts, to screws set among tandem planes above, is but a short step; and, when this has been accomplished, it is the opinion of the writer, a comfortable air-and-water long-distance passenger-carrier will be in sight. Indeed, so thoroughly is the writer convinced of the ease, celerity and safety with which the further development of the aeroplane may be prosecuted, if the work be conducted over water, that,

with every wish to avoid the appearance of sensational prophecy—which to him is extremely repugnant—he is prepared to say that out of this movement the world may shortly expect to see arise heavier-than-air structures that will rival the Zeppelin in longitudinal dimensions, and far surpass it in carrying capacity, speed, range of action, and economy of cost and operation. As the surface of Lake Constance made the Zeppelin possible, so will other favoring water-surfaces facilitate the swift transformation of the marine aeroplane from a single-person or few-passenger small-craft, to a roomy and safe liner of power, equally at ease upon sea or air. The materials, mechanisms, and engineering skill for such an undertaking are already at hand—nothing is needed but the will, the energy, the purse, and the technical knowledge of another Zeppelin.

Meanwhile, it is of stirring interest to know that the preliminary steps have been taken, and the development of the first sea-and-air-worthy craft—though they be small—is proceeding with the utmost success. Whatever may be hoped for in larger units, the small unit of the sportsman—swift, handy, and safe—is already here; and with it there has come over the rather grim aspect of the sport of flying a most welcome cheerfulness. All who have flown the hydraeroplane, whether it be the Curtiss, the Wright, or the Burgess-Wright, pronounce it a thoroughly safe and enjoyable craft. There have been many spills, but no seri-

ous mishaps; and, in a suitably-designed machine, a ducking seems to be the most serious penalty attached to water flying. By a suitably-designed machine is particularly meant one in which pilot and passenger sit free of any facing obstruction, and in which they are so placed that, in the event of a too-abrupt descent upon the water, and the consequent sudden arrest of the forward motion of the machine, they will be shot clear of stanchions, wires, and mechanism. This, of necessity, condemns the placing of engine or screw forward of the seats, which would be an extremely dangerous practice. In opening this new field of flying to the public, a responsibility of unusual weight rests upon the constructor. If he be wise and conscientious he will use infinite care to safeguard those who entrust themselves to his machine. There have been enough deaths ashore to make him realize, when over his drawing board and in his shop, that he is dealing with the lives of human beings; and that in this new sport, which by nature is the safest form of flying, there can be offered for him no excuse, if he adopts a single avoidable feature which jeopardizes life. The interests of the industry, too, are at stake, for it requires no foresight to perceive that once water-flying shall have become known as a pronouncedly safe sport, there will scarcely be limit to its popularity and growth, for it offers a new kind of recreation that is unlike any other to be had.

THE FOURTH ARM

From the London Daily News.

FROM a purely military point of view, the outstanding feature of the Italian operations in Tripoli has been the successful utilization of aeroplanes for both defensive and offensive purposes.

Too little attention has been given in this country to the highly-effective work carried out by the officers of the Italian air corps. The series of reconnaissances undertaken by Captain Piazza on his Blériot monoplane to and from the town and the outskirts of the desert, the dropping of bombs by the military airmen over the Turkish camp at Ain-Zara, and, lastly, the signal assistance rendered by the flying machines in the desperate battle of October 23rd, afford, indeed, incontestable evidence of the value of the "fourth arm" in actual warfare.

The success that has attended these important operations is beyond anything anticipated. Leblanc, the "lightning flyer," says the Italians have established the fact that aeroplanes afford ideal means of reconnoitering in war time, and Blériot, following in the same strain, says he did not think two years ago, when he crossed the Channel, that flying machines would so soon be used on or over battlefields.

While our Air Battalion is about to be reinforced and reorganized, and the War Office are actually arranging a competition for military aeroplanes, the publication of a detailed account of the performances of the Italian airmen in and round Tripoli will be opportune.

THE ITALIAN FLYING MEN.

The Army Air Corps dispatched from the Pordenone military school, near Milan, to Tripoli, consisted of only half a dozen aeroplanists, namely, Captain Piazza, Captain Moizzo, and Lieutenants Gavotti, Rossi, Roberti and de Rada. The corps reached the seat of war on October 19th, and on the 22nd, Captain Piazza, on his Blériot, made his first flight over the town and the country round, covering a distance of about eighty miles. In a subsequent reconnoissance the same officer detected the presence of the Turkish and Arab forces some fifteen miles from the Italian headquarters. Previous reports had given the enemy's position as sixty miles away.

The facts detailed hereunder speak for themselves: "The battle which was fought at Tripoli on October 24th," writes the correspondent of the Central News, "will remain celebrated in military

annals as the first engagement to be directed entirely from aeroplanes." (The date here is wrongly given. The battle referred to must be that of October 23rd, when the Italians had to withstand the joint attack of the insurgents in the town and that of the Turks and Arabs from outside.)

"Three machines were employed," continues the correspondent. "One, operated by Captain Piazza, watched the centre; the second, that of Captain Moizzo, hovered over the left; and the third, that of Lieutenant Rossi, was on the right. Each aviator was accompanied by an officer of the general staff, who followed closely the various phases of the combat in his own particular zone.

SCOUTS IN THE AIR.

"These observers were able to write notes of the progress of the battle, which they threw down to those below when the aeroplanes returned at intervals in the direction of the commander-in-chief's position. The commander-in-chief had thus merely to regulate the movements of the troops in accordance with the indications furnished by his aerial general staff.

"The system was found excellent in operation, and it worked without a hitch throughout the battle. It was the employment of the aeroplanes which made it possible for the enemy to be attacked in flank and in rear, and the execution wrought by the Italian artillery was also largely due to the observations of the military airmen."

Here is another remarkable incident, showing the effectiveness of the flying machine for offensive purposes. In the course of a reconnoissance, carried out last week by Lieutenant Gavotti, the officer flew over the Turkish camp at Ain-Zara, and dropped four bombs. He states that one of the bombs took considerable effect, creating a scene of indescribable confusion among the enemy. The soldiers fled in all directions, and the animals stampeded.

Again, in the battle fought on October 26th, the assistance given by the military aeroplanists proved invaluable. "The aviators," declares the special correspondent of the *Daily Telegraph*, "handed in many useful reports regarding the direction of the firing." One need not wonder, therefore, that the Italian War Office have ordered additional flying machines to complete the scout service throughout the line of occupation. It is also proposed to send aeroplanes to Erythrea and Italian Somaliland, the latter country being still unexplored.

MILITARY AERONAUTICS

Report of the Chief Signal Officer of the U. S. Army, Brigadier General James Allen

THESE reports have recorded during the past four years the progress of military aviation by the Signal Corps of the Army in a concise form, beginning with the first contract for the purchase of an aeroplane designed by the Wright brothers, the specifications for which were issued by this office in December, 1907. The progress and development of this auxiliary to the military establishment during this period is believed to be without precedent. Although the United States was the first nation to recognize the aeroplane for military purposes, and carried out the first official government tests of an aeroplane in 1908-1909, at Fort Myer, Va., yet, such has been the phenomenal progress in this science and art that this country has been left far behind in securing practical equipment and organization for the use of this recognized indispensable adjunct to war.

The Army appropriation act for 1912 includes an item of \$125,000 for the purchase, maintenance, operation and repair of aeroplanes and other aerial machines, and \$25,000 of this fund was made available immediately. This enabled the Signal Corps to purchase and supply the manoeuvre division, organized at San Antonio, Tex., with a small aeronautical equipment, which was used for the training of officers and for actual reconnaissance work in division manoeuvres during the period from March to July of the current year. An aviation school has been started at College Park, Md., in the vicinity of Washington, for the training of specially selected officers in the military use of aeroplanes and in accessory subjects. At present the aeronautical equipment of the Signal Corps consists of five aeroplanes and three small captive balloons. There are at present six Army officers holding a pilot's license for the operation of aeroplanes. The Signal Corps is at present confronted with the situation of having means provided for starting the development of aviation in the Army, and the War Department is unable to detail the necessary officers to be trained as aviators. In order to develop aviation it requires two essential things, namely, money and officers and men; either one of these without the other brings all adequate development to a standstill.

PROGRESS IN AVIATION DURING THE PAST YEAR.

The past year has been one of continued achievement in aeronautics, especially as applied to aviation. The most notable progress in military aeronautics has been accomplished by France, Germany and England. The past year has witnessed the development of the hydro-aeroplane, which is a new type of vehicle capable of locomotion, either in the air, on the surface of the water, or on the surface of the earth. The attainment of this object opens up a substantial extension in the use of aeroplanes, both for military and naval purposes, and especially for general co-operation of the Army and Navy. Cross-country flying has reached the point where a single aeroplane has made a successful trip from St. Louis to New York via Chicago. This has been accomplished without transporting any special mechanic or special repair kit. During the year the speed has gone up to about eighty miles an hour, and as many as a dozen passengers have been carried in an aeroplane. Continuous flights have been made of over fourteen hours, and the distance reached in continuous flight has been about 400 miles. The altitude has been increased to about 13,000 feet, and English and United States mails have been officially transported by aeroplane. For military purposes it has been conclusively shown that the two-place machine is necessary for reconnaissance purposes.

In order to secure accurate and reliable military information the observer must be able to give his sole attention to the terrain below, and this is most important, since all objects seen from an aeroplane appear in an entirely different perspective from

the same objects viewed by an observer upon the surface of the earth. The military airman must be specially trained by continued practice to accurately discern and report the objects below him. In other words, it is necessary that he must possess to the highest degree the qualities of a soldier, and in addition must be carefully trained in making observations in flight.

THE FOURTH MILITARY ARM.

France has continued to be a leader during the year in the practical organization and development of aviation to serve the mobile army. In the recent manoeuvres held on the eastern border of that country aeroplanes were used extensively and were divided into groups consisting of seven machines with each of the two army corps, three machines with the artillery of the eastern army corps, and three at the disposal of the director of manoeuvres. Total, twenty aeroplanes.

The types and makes of aeroplanes used during the manoeuvres were eight monoplanes, Blériot; six biplanes, Henry Farman; three monoplanes, Deperdussin; two monoplanes, Morane; one monoplane, Breguet.

The organization, transport and equipment of these groups for field purposes were:

Organization. Each aeroplane, one or two pilots, two or one observers, and six enlisted mechanics.

Each group or "field-aviation section" consisted of three or four aeroplanes with their personnel, transportation, and equipment for men and machines, material for supply and repairs, and tents for sheltering the machines in camp.

The supply and transport of these machines was accomplished by the following means: Each field section was divided into three echelons.

First echelon: The aeroplanes, their trucks for transport by road, their "tractors" or traction automobiles for hauling the trucks and transporting the crew, aeroplane tent, repair tools, spare parts most used, enough gasoline and oil for a 375-mile flight, a litter, and surgical material. These tractors have a speed of twenty-five miles per hour.

Second echelon: The freight automobiles, containing complete spares and reserve supplies. Their speed is slower than the tractors of the first echelon.

Third echelon: Repair-shop automobile.

The first echelon corresponds to the combat train of a field battery. It moved with the combat trains. It camped near corps headquarters. The aeroplane normally traveled by air. On occasions it was placed on its truck and hauled by the tractor. When less time was available the wings of the machines were folded and the aeroplanes hauled on their own wheels. Time, atmospheric conditions, and military considerations governed the method of transport in each case.

The second echelon freight wagons carried extra motors, wings, frames, controls, and in fact all parts necessary to make complete repairs to the aeroplanes. At present the French utilize two such wagons for each section, namely, for three or four aeroplanes. This echelon normally moves with the regimental trains and joins the first echelons at night.

The third echelon consists of a workshop on wheels with automobile traction. It carries a forge, tools, and material for repairs to frames and motors. It has an electric light plant for use in night repairs. With this echelon are three 3,000-candle-power searchlights. These were used for the triple purpose of lighting the work, lighting the landing park, and by their beams guiding aviators to their landing places. It is understood that there is one of these workshops with each section.

The French Army actually used five sections, constituted as above, in the recent manoeuvres. The Sixth Corps used two sections and the Seventh Corps three sections. These sections were

several times moved during the course of the manoeuvres. They camped at Villersaxel, Lure, and Héricourt, as directed and required by the military situation in each case.

The section which was used with the field artillery of necessity utilized a different means of transporting its first line supplies. As the cross-country work of artillery would not permit the use of automobile traction, a limber was so arranged as to haul behind it a van, which carried a specially light tent and accessories, spares, tools, gasoline and oil. Six horses hauled the limber and its van. This van was arranged to carry a disassembled aeroplane, in addition to the spares, tools, etc., above mentioned. The total weight behind the team was about 4,500 pounds, so that this echelon could remain with the artillery on the march and camp with it at night.

At the time of the manoeuvres there had not yet been devised second and third echelons for aeroplane sections operating with field artillery.

One of the definite problems solved by aeroplane reconnaissance at these manoeuvres was:

On September 9 an officer made four reconnaissances in quick succession. On one of these trips he discovered that a counter-attack was in preparation on the right flank. He flew quickly to the nearest brigade headquarters, secured a horse, and, galloping to the general, gave him the information, which enabled timely preparations being made to ward off the blow.

The aeroplanes attached to the field artillery did excellent work in locating hostile batteries. Previously, during target practice, this same section had been highly successful in plotting the hits, thereby increasing the efficiency of fire to such an extent that a distinguished French specialist has said: "Two batteries and one aeroplane are five times more redoubtable than three batteries without an aeroplane."

The French Minister of Finance in his 1912 estimates for the army has included approximately \$1,000,000 for the "extension of the aeronautical service."

The Chief Signal Officer concludes this report with an urgent appeal for additional officers and men to carry on the work of the Signal Corps as now prescribed by law. It is believed that it is the duty of the War Department to present to Congress at its coming session the critical needs of this corps and that if these needs are properly understood there will be no hesitancy in providing the minimum personnel required at the present moment to carry forward the important and diversified work at present devolving upon the Signal Corps of the Army.

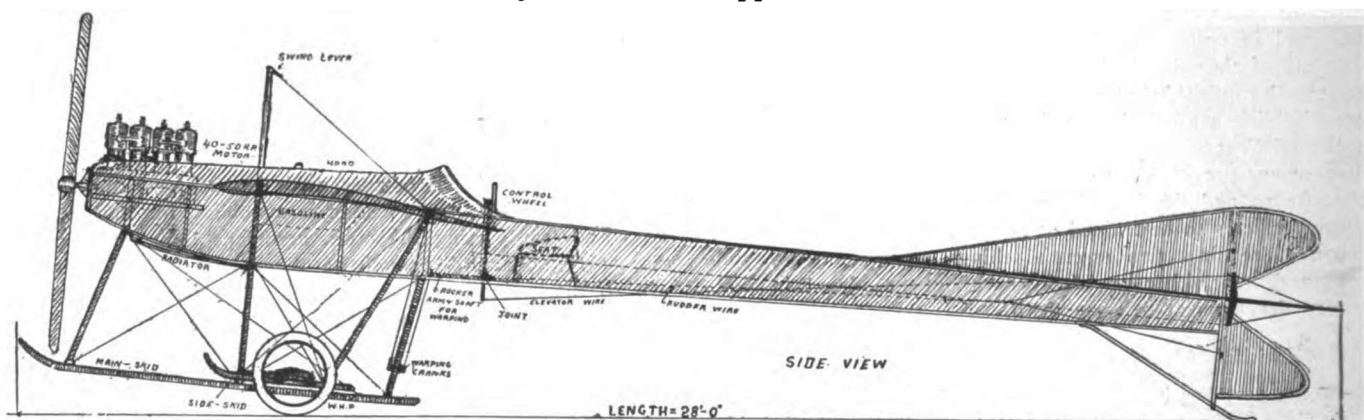
Very respectfully,

JAMES ALLEN,

Brigadier General, Chief Signal Officer of the Army.
The Secretary of War.

SUGGESTED DESIGN FOR A MONOPLANE

By Walter H. Phipps



In presenting the accompanying design for a monoplane, it has been the aim of the writer, not to evolve an absolutely original machine, but merely to combine in one aeroplane the best features of present day practice, together with several original ideas, in such a manner as to form an efficient, safe and easily controlled aeroplane.

For this reason each section is described separately with an explanation of the suggested changes and functions of each. It is hoped that this method of procedure will lead to discussions upon matters which generally escape attention, and so will tend to direct more attention to those parts which need improving.

FUSELAGE.

The fuselage of a monoplane is perhaps its most important component, forming as it does the backbone of the whole machine. It must be so constructed as to offer little head resistance and yet be light and strong. There are several forms and shapes of fuselages, some long and narrow as the Deperdussin and Bleriot; others deep and stubby like the Nieuport and R. E. P.

While the deep-stream-like type of fuselage cuts down head resistance and is productive of great speed, it offers no material advantage as regards safety, owing to the fact that the operator sits well inside the body with only his head sticking out and must necessarily sit well forward in order to be able to see, thus placing himself in grave danger in the event of rough landings, as was emphasized in the accident which cost Nieuport his life.

Turning now to the design of the suggested monoplane, it will readily be seen that the fuselage is a medium between the Deperdussin and Nieuport types. It is of the box-girder construction, tapering both front and rear, and fitted with a long

aluminum hood in front, which protects the pilot and aids in giving the fuselage a stream line form. As will be noticed the pilot sits well to the rear of the machine and is thus protected to a large extent by the front of the fuselage in the event of bad falls. As it is almost impossible for this type of machine to tilt over forwards in landing it might be well for the pilot to strap himself in with an elastic shock absorbing belt fitted with a quick release, such as the kind made by Robert Esnault Pelterie.

THE PLANES.

Glancing at the top view of the machine it will be noticed that the wings are of the Morane type; that is to say, they have their greatest breadth at the rear instead of the front, as is the practice on most machines. The advantages of this form of plane are twofold, namely: first, they give the greatest warping area at the rear extremities of the wings, consequently giving greater leverage and increased efficiency; and secondly there is added surface at the rear of the wing and there-

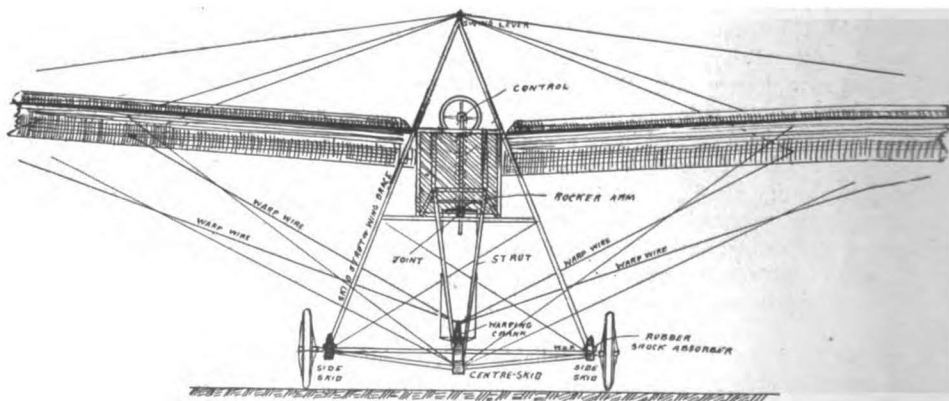


Fig. 1 - FRONT VIEW

fore added lift towards the rear of the machine, thereby eliminating the necessity of fitting an extra large flat tail or a lifting rear plane. As will be noticed a piece is cut out of each wing just behind the rear main-spar and at the point where it joins the body, thus allowing the pilot a clear view of the ground immediately below him as well as in front of him. The wings attach to the fuselage in the usual manner. The front spars fit into a tube which extends across the top bars of the fuselage while the two rear spars fit into rocker sockets in the sides of the fuselage.

CONSTRUCTION OF WINGS.

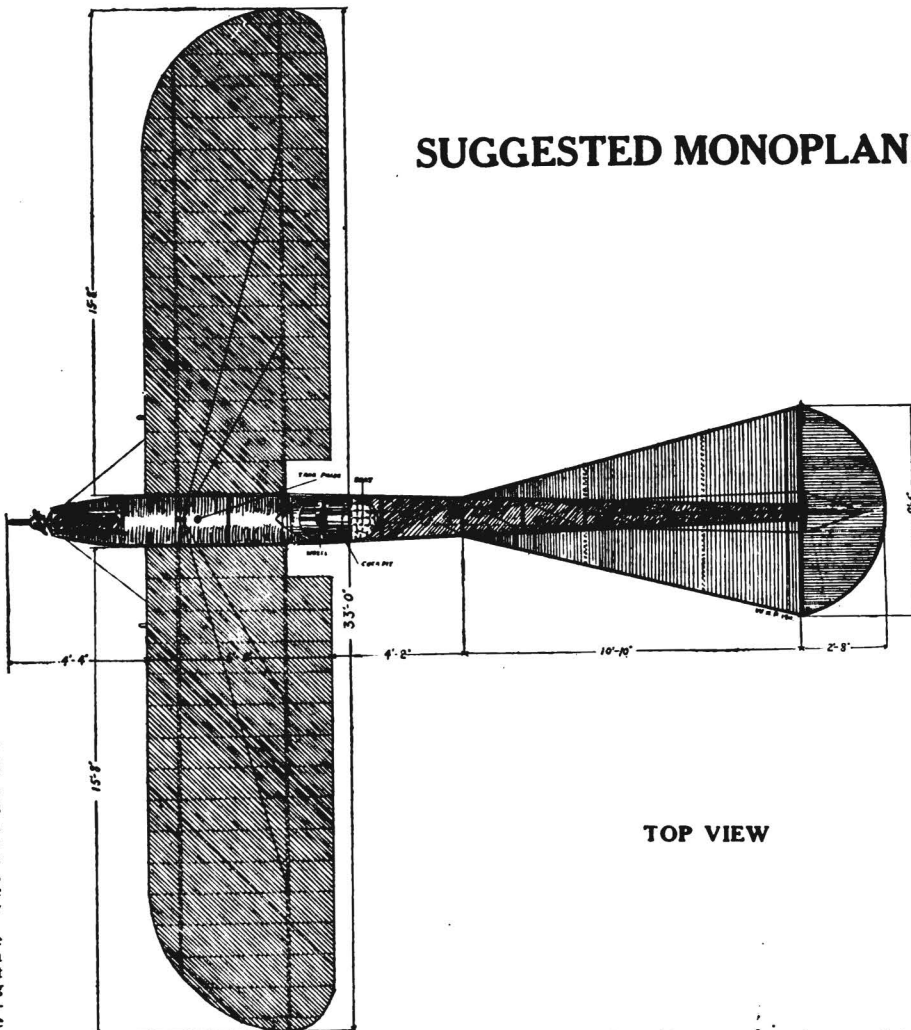
Great care should be exercised in the construction of monoplane wings for it must be borne in mind that they form the entire support of the machine and must necessarily be capable of withstanding all strains. As the wing-spars are the backbones of the wings and next to the wing guy wires, must stand most of the strain, it is necessary that they should be strongly built. In the first place they should not be the same size throughout their entire length, but should be thickest and strongest at those points where the greatest strain takes place. For this reason they should be thickest in the centre and at the two points where the guy wires attach, (see Fig. 5). It has occurred to the writer that on large passenger carrying monoplanes it would be well to make the main spars from two pieces of wood bolted together with a thin steel plate between them extending their entire length.

The ribs are of the Nieuport type built up in the manner shown in Fig. 2. The whole wing should be strengthened by internal wiring and the cloth kept from becoming baggy by the introduction of longitudinal strips of wood.

THE TAIL.

The proper design for the tail of a monoplane cannot be given too much attention, for it is this important part of the machine that has the most to do with its safety and control. If the tail of a monoplane is constructed too large or is of the lifting plane type it is likely to cause a serious accident in the event of having to land with a following wind, it often happening that in such cases it is impossible to get the tail down, with the result that the machine crashes head on. If, on the other hand, the tail is too small and the weight too far back, the machine will be tail heavy and perhaps slide backward.

In order to secure a reasonably safe monoplane the tail must be so proportioned as to act as a damper or non-lifting plane; that is to say, that the machine should be so balanced by distributing the weight of the engine and pilot in such a manner as to properly balance without the tail plane having to lift more than its own weight. In normal flight the tail and elevator should fly straight out in the stream line of the machine, the elevator being used solely for directional purposes and not as a lifting surface. If this is done a remarkable degree of longitudinal stability can be secured and yet by making the elevator large enough the machine can be made quite sensitive.



TOP VIEW

THE LANDING GEAR.

There is perhaps no part of present day aeroplanes that is so open to improvement as the landing gear and for this reason too much care and consideration cannot be given to this vital section of a machine.

The simplest and most efficient form of landing carriage so far devised for speed purposes is the Nieuport, and while it works satisfactorily if the wheels hold, it is nevertheless a most dangerous arrangement in the event of a wheel buckling and the end of the spring catching and capsizing the machine.

In referring to the accompanying drawings it will be seen that the suggested landing gear consists of an arrangement of three rigid skids and two shock absorbing wheels, which are so arranged that the two wheels take the first shock through their rubber springs and then the centre skid strikes. If the shock is severe and the central skid should break, the two side skids then come into action. It will thus be seen that it will take a very rough landing to rip the landing gear away and if such should happen the shock will be so broken that little harm should befall the pilot. Another advantage of this arrangement is that on account of the central skid projecting out in front it protects the propeller and prevents the monoplane from capsizing.

CONTROL.

Great care must be exercised in the designing and constructing of the control gear of an aeroplane, for upon the proper action of this most vital organ depends the safety of the whole machine at all times. For this reason all unnecessary pulleys should be eliminated, especially in the warping control, and no complicated joints or fittings used, which would be liable to cause the controls to jam.

As will be noticed from a study of the accompanying illustrations all pulleys have been eliminated from the warping and all wiring doubled. The necessary warping movements are accomplished by the use of rocker arms and wires (see Figs. 3 and 4). On the floor of the fuselage is a pivoted steel rod which has a rocker arm at the front end and a pivoted control column at the other end. At the top of the control column is the steering wheel which actuates the rear rudder by turning. Warping is obtained by moving the column from side to side thus rocking the rocker lever at the end of the pivoted tube and transmitting the motion to the warp lever mounted on the skid struts and thence through wires to the wings. Steering up or down is accomplished by moving the control column forward or backward. Here again it will be noticed that the wires are connected direct to the column and do not pass over pulleys as on the Bleriot.



Fig. 2. CROSS SECTION OF RIB

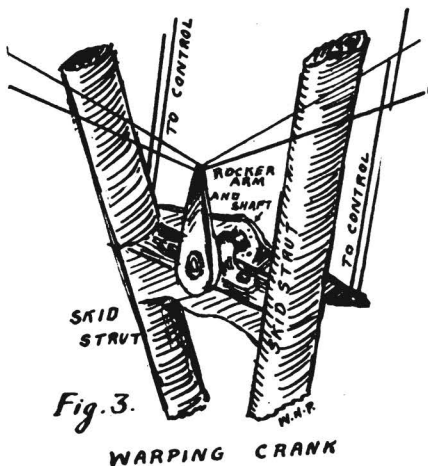


Fig. 3. WARPING CRANK

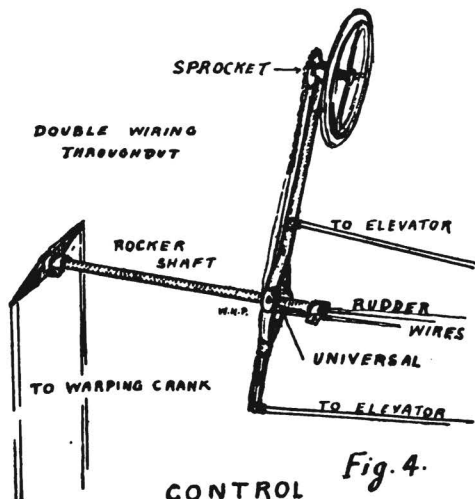


Fig. 4. CONTROL



Fig. 5.

MAIN-SPAR OF WINGS

Some Construction Details



EDITORIAL

NOTHING THE MATTER WITH AVIATION.

SOMEONE has asked "what is the matter with aviation" and we answer, nothing! emphatically nothing.

Aviation is merely the germ of a great transportation system of the future. It is but the acorn of a great oak—the seed from which must come the real substance. For the acorn to grow into the mammoth oak requires time and for our present aviation to grow into a great aerial transportation system requires time. It must be remembered that the most substantial things in life require the most time to develop and those things which grow up rapidly as a rule go down just as rapidly. Sudden expansion means sudden explosion.

Who would compare the mushroom, which springs up in a night, with the solidity and usefulness of the giant oak which requires generations to mature?

Those people who have gone into the aeronautical movement thinking that they were going to make fortunes in a month or a year are going to be disappointed and are likewise going to drop out of the movement quickly, but those who have entered the movement for the purpose of being in the foremost ranks of progress and helping to develop what will eventually be the world's greatest industry, will not only enjoy the satisfaction that usually comes to those who are patient and unselfish but will also be rewarded with financial returns commensurate with the energy and ability exercised in the development of the industry. It is much better for the movement anyway that the weaklings depart and that only those with strength and perseverance remain to carry on the work.

Statistics of the aeronautical movement for the past four years prove conclusively that aviation from every conceivable view point has progressed not only continuously and substantially but in comparison its ratio of development has been even greater than the railroad, steam-boat or automobile industries in the same length of time during their infancies.

It is but a few short years back that the automobile industry underwent the same stage of development as at present the flying machine industry is undergoing and the weaklings were dropping out by the hundreds claiming that there was no future for the automobile; but those with foresight, patience, courage and energy remained to prove that there was a future for the automobile and to reap rich rewards for their labors.

AIRCRAFT predicts that within ten years the flying machine industry will have eclipsed in scope that which the automobile industry now holds or even will acquire by the year 1922.

Furthermore the year 1912 is going to show greater progress in the aeroplane industry in the United States than it did during the year of 1911, just as the aeroplane industry of 1911 showed greater progress than in the year of 1910 and just as its development in 1910 showed a gain over that of 1909.

This being the case, therefore, we again say there is nothing the matter with aviation. It is just enjoying a healthy normal growth.

SPEED, SAFETY, ECONOMY NEEDED.

THE three main factors that will eventually bring about a permanent aerial transportation system are speed, safety and economy. To begin with speed is the leading factor because it saves time and time is man's greatest asset.

Only a few years ago it took ninety days or more for man to transport himself and luggage from New York to California by land. In those days he used oxen and horses and mules. Since that time, however, steam locomotives have taken the place of the quadrupeds—wheels superseded legs—and man can now travel from New York to California within five days thereby saving eighty-five out of ninety days through the process.

Still in the early days of railroads there were people who were afraid to ride on trains just as some are afraid to ride on flying machines in these days.

There is a train today which leaves New York at 4 o'clock P. M. and gets into Chicago at 8:55 A. M. tomorrow morning on which an extra fare of ten dollars is charged for the speed it makes and the time it saves. If one took another train it would not arrive in Chicago until 5 o'clock P. M., therefore the speed of the fast train saves the business man a whole day that he may employ to advantage instead of spending that time in the cars—and that is just the reason why the fast train is patronized so extensively.

In New York a subway was recently built in which fast express trains were made to run from one end of the city to the other in thirty minutes, whereas the old system of surface cars required nearly three hours to go the same distance. Naturally the speedy express is

patronized to a far greater extent than the slow surface cars.

Now, that is just where the speedy flying machine of the future will secure the advantage over the slow going land vehicles. We believe that in fifteen or twenty years from now a vehicle will be constructed that will shoot through the air at the rate of three hundred miles or more per hour and be sufficiently large to carry a hundred or more passengers.

This being the case, it would simply mean a ten-hour trip or thereabout from New York to San Francisco. A passenger could enter an air vehicle at 12 o'clock at night and be in San Francisco at 6 o'clock in the morning deducting, of course, four hours for the difference in time going from East to West; or, he could leave San Francisco at 6 o'clock at night and arrive in New York the following morning at 8 o'clock, in this case adding four hours for the difference in time.

We do not believe that it will ever be possible for land vehicles to make such speed and that is one reason why travelers will prefer the air car to the land vehicle for no man who values his time will spend five days on railroads if he can make the same journey by the air route in one night. It would be patronized even if the fare were two-fold, for, in the saving of time man naturally saves money and the extra fare would mean no more to him than the extra fare means to the man who rides from New York to Chicago on the "Twentieth Century Limited." However, we know of no good reason why the fare from New York to San Francisco should cost more by the air route than it does by the slow going land transportation system.

To begin with there is going to be a great saving in the air lines over the land lines in construction work alone. There will not be the tremendous outlay of capital for exploring a route or for obtaining from various legislatures the right of way or for the purpose of purchasing land upon which the land vehicle must pass over, or in the grading of the land and building road beds, or the boring of tunnels through hills and mountains or the laying of ties and expensive steel rails and various other things which go to make up an enormous expenditure before even the vehicle is considered; and there is no good reason why the air car cannot be constructed as cheaply as the land car in which case the tremendous outlay for the right of way, land, road beds, steel rails, etc., will be eliminated thus making possible a reduction in the cost of air transportation over land transportation instead of an additional expense as some people claim.

These people, by the way, usually compare in figures the cost of the present aeroplane and its operation to land vehicles, not taking into consideration that the aeroplane is being built singly and without system or adequate machinery, while railroads for instance have been in use for more than half a century and through extensive utilization the cost of construction and operation has been cut down to a minimum.

The evolutionary development of the present aeroplane into the great passenger carrying air vehicle of

the future will naturally reduce the cost of construction until it reaches a point where it will be no greater than that of the land vehicle in which case the saving will come from the disuse of the road beds, etc., as aforesaid. So we contend that the air vehicle of the future will not only be speedier than land vehicles and thus save man's valuable time, but also that it will be a more economic means of travel, and if this is so then there is nothing left to hinder the growth of aerial transportation except the factor safety and this we believe will keep pace with both speed and economy just as the development of safety kept pace with that of speed and economy in railroading, steam-boating and automobiling during the past.

BATTLE AMONG THE CLOUDS.



HAT battles in the air will soon be fought is truly not to be classed as a dream in these days. In fact, the first battle, or skirmish, would have already taken place in the year of 1911 at Tripoli if the sleepy Turks had had the foresight to study the science of aviation and supply themselves with aeroplanes and aviators.

What else could have happened but a fight in the air if the Turks had sent out aeroplane scouts to offset the Italian aeroplane scouts?

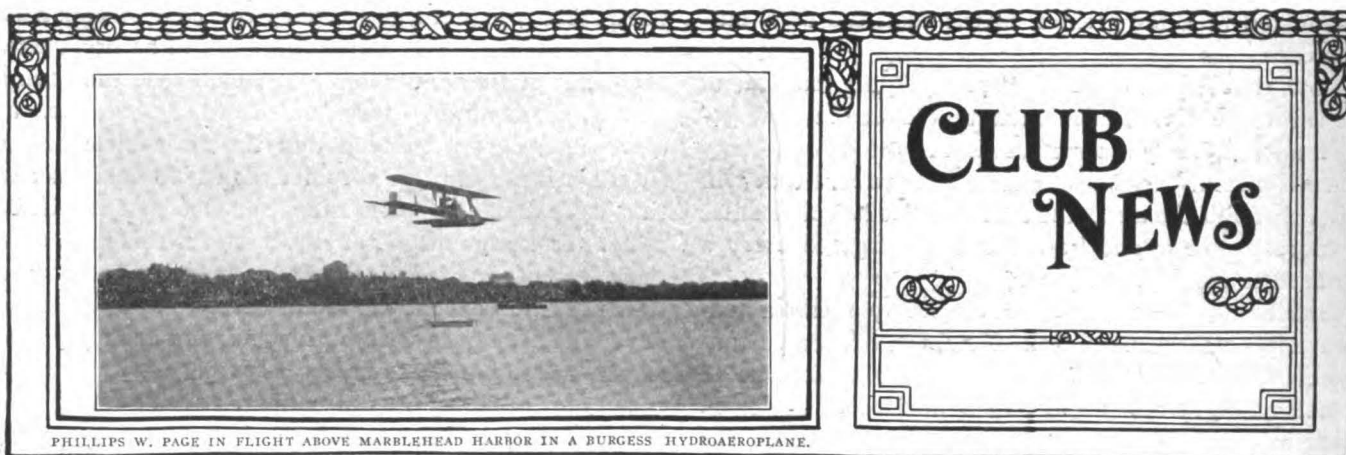
How important has been the work done by the airmen in the military operations at Tripoli may be judged by the fact that the Italian war department has ordered additional flying machines to strengthen their scout service.

It is understood also that the Turks having been given a demonstration of the great value of the aeroplane to their own detriment and sorrow, are now determined to assemble a fleet of aeroplanes at the earliest possible date in order to put themselves upon the same war footing as the Italians. If this is done then what is to prevent an early battle among the clouds?

We suggest that manufacturers who would like to obtain Government contracts, experiment with aeroplanes painted sky-blue for war purposes.

We are of the opinion that if everything about an aeroplane were arranged in this color even to the clothes of the aviator that the machine could pass out of the range of vision within a thousand or two thousand feet thus making it impossible for landmen to even see it let alone train their aeronautical guns upon it.

While there is not a gun in the world that has as yet proved it is capable of hitting an aeroplane in swift flight, still those who advocate the war aeroplane should bring into use every possible invention that will demonstrate its great superiority when put to an actual test, in fact make the opposition appear as weak and ridiculous as a tribe of savages with their knives and arrows fighting against a well drilled regiment with gatling guns, for the step of advancement between the land fighters and the air fighters will sooner or later be just as great.



PHILLIPS W. PAGE IN FLIGHT ABOVE MARBLEHEAD HARBOR IN A BURGESS HYDROAEROPLANE.

Aero Club of America

At the meeting of the Board of Governors held on November 23d, Mr. John H. Worden was granted aviation pilot's license No. 76.

PROHIBITION OF FLYING OVER GAMES.

On November 13th the following resolution was passed by the Board of Governors:

Whereas, It has come to the notice of the Board of Governors of the Aero Club of America that the practice of flying over spectators and contestants in athletic sports and games is becoming prevalent among aviators, and

Whereas, such flying unnecessarily endangers human life.

Be it therefore resolved, That all aviators licensed by the Aero Club of America be and are hereby forbidden to fly over or in the close vicinity of spectators or contestants in games or sports other than licensed aviation meets or exhibitions in which the flying is governed by the rules for the meet or exhibition, and

Be it further resolved, That the Contest Committee be and is hereby instructed to take cognizance of any violation of the above inhibition and apply such one of the penalties set forth in Article 63 of the Regulations of the International Aeronautical Federation as it may deem expedient.

At the adjourned annual meeting held at the clubhouse on Monday evening, November 27th, the following named members were unanimously elected governors, of Class A:

G. F. Campbell Wood, term expires.....1912
Henry A. Wise Wood, term expires.....1913
C. E. Knoblauch, term expires.....1914
W. Redmond Cross, term expires.....1915

It was also decided that a Fifth Class of Membership be instituted comprising commissioned officers of the Regular Army and Navy of the United States, and that the initiation fee of this class be ten dollars, and the dues ten dollars.

ARMY AND NAVY MEMBERS

As the officers of the Club are particularly desirous that the Army and Navy of the United States shall be adequately represented in its membership, it is hoped that there will be prompt response to the action of the Club in creating Class Five from members who may wish to propose friends who are in the service.

ANNUAL DINNER

The Honorable William H. Taft, President of the United States, has accepted the invitation of the Club to be its guest at the annual dinner of the Aero Club of America, to be held on the evening of Saturday, January 27th, 1912.

AERONAUTIC SHOW

On November 8th, the Working Committee of the First Annual Aeronautic Show was created, composed of the following members:

W. Irving Twombly, chairman; Roger B. Whitman, secretary; A. Holland Forbes, Charles E. Spratt, Alford Reeves, E. L. Jones, Charles de San Marsan, Otis F. Wood, G. F. Campbell Wood, Henry A. Wise Wood.

F. A. I. Rules for Licenses

AVIATOR.

Applicants must pass the three following tests: (A) Two distance tests, each consisting in covering, without touching the ground, a closed circuit not less than five kilometres in length, (length measured as indicated below).

(B) An altitude test consisting in rising to a minimum height of 50 metres above the starting point.

(C) The (B) test may be made at the same time as one of the (A) tests.

The course over which the aviator shall accomplish the aforesaid two circuits, must be indicated by two posts situated not more than 500 metres from each other.

After each turn made around a post, the aviator will change his direction so as to leave the other post on his other side. The circuit will thus consist of an uninterrupted series of figure eights, each circle of the figures alternately encircling one of the posts. The distance credited over the course covered between two turns shall be the distance separating the two posts.

For each of these three tests the landing shall be made:

(1) By stopping the motor not later than the time when the machine touches the ground.

(2) At a distance of less than 50 metres from a point designated by the applicant before the test.

Landings must be made properly and the official observer shall indicate in his report the way in which they were made, the issue of the license being always discretionary.

Official observers must be chosen from a list drawn up by the governing organization of each country.

SPHERICAL BALLOON PILOT.

Applicants must pass the following tests:

(A) Five ascensions without any conditions.
(B) An ascension of one hour's minimum duration undertaken by the candidate alone.

(C) A night ascension, with the understanding that if the start takes place before sunset, the landing must be effected after midnight, and if the start takes place before midnight, the landing must be made after sunrise.

The issue of a license is always discretionary.

DIRIGIBLE BALLOON PILOT.

The applicant must:

(A) Hold a spherical balloon pilot's license.
(B) Furnish proof of having made six voyages, in a dirigible balloon on different dates, of which one, at least, must have been of an hour's duration, and on at least three of these occasions the dirigible must have been handled by the candidate himself.

The application for a license must be endorsed by two Dirigible Balloon Pilots, who have witnessed at least three of the starts and landings of the candidate.

The issue of a license is always discretionary.

The Aeronautical Society

The Aeronautical Society has decided to move their training grounds from Mineola to Bergen Beach, New York, which point is located on the edge of the water upon which it is intended to do much experimental work with the hydro-aeroplane types during the coming season.

Meetings continue to be held on the second and fourth Thursday of each month at the Society's rooms, 250 West 54th Street, New York.

The Aero Club of Illinois

The Aero Club of Illinois has been showing great activity in its developments lately and are planning to do big things during 1912. The usual technical discussions are carried on at the Club's rooms in the Auditorium, Chicago, weekly, and the attendance at these meetings is large.

The membership has already grown to one thousand which is probably the largest membership of any Aero Club in the United States. The officers believe that they can triple this membership within the next year or two and thereby make Chicago the aviation centre of the United States.

Captain Horace B. Wild, who has done so much to promote aeronautics in the West, has left for a tour of Europe for the purpose of making a complete study of clubs and aviation grounds there and also to learn the latest European methods in the industrial development of flying machines and airships.

Several meets are being planned for Chicago during the summer and arrangements are now being made for the remodelling of the Club's aviation field.

The Aero Club of California

The Aero Club of California is planning to hold a ten days' meet in the latter part of January, the dates already set being from January 20th to 29th, inclusive. This meet will be held on the Dominguez field, Los Angeles, which field is now controlled by the Club through an option from the American Aviation Company, which expires October 1st, 1913. It is hoped that thirty or more aviators will take part in the coming meet and the Club will try to raise a prize fund sufficiently large to attract the best flyers. Among other events planned are a competitive race over a mile track and a one hundred and fifty mile tour to be called the "Circuit of California."

The Aero Club of Long Island

The annual meeting of the Aero Club of Long Island was held December 7th. The following officers were elected for the ensuing year: Charles Wald, president; Charles D. Spence, first vice-president; William T. Newell, second vice-president; Joseph K. Post, secretary, and Henry I. Newell, treasurer, were re-elected to their respective offices.

There will be a change in the Board of Directors owing to the expiration of the term of Howard C. Brown. Thomas Kramer was elected to fill the vacancy. The directorate for the ensuing year is as follows: Charles Wald, chairman; Francis C. Willson, John H. Lisle, Henry I. Newell, Jr., Thomas Kramer.

The meetings of the Club are held on the first Thursday of each month.

Aero Club Italiano

An Italian Aero Club has been formed in this country for Italians residing in America who are interested in aviation. The Club rooms are located at 135 West 12th Street, New York, and on Saturday evening, December 9th, 1911, the Club gave a reception to its members and their friends. Regular monthly meetings will be held in the future.

Y. M. C. A. Aero Clubs

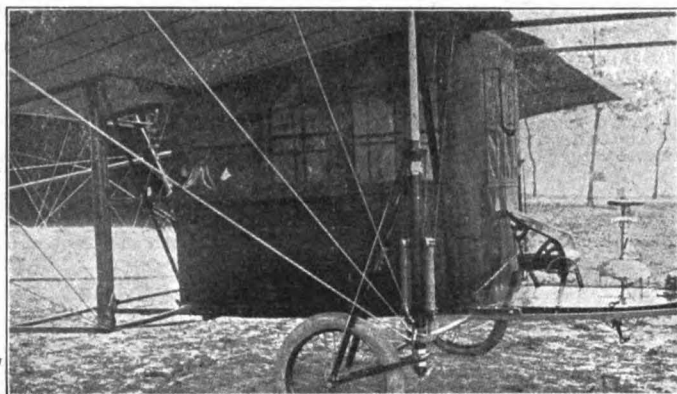
On Saturday evening, Nov. 18, Mr. S. S. Jerwan, pilot, Aero Club of America, gave the first of a series of lectures on aviation at the 23d Street Branch of the Y. M. C. A., 215 West 23d Street, New York, where he spoke before a large and appreciative audience. Mr. Jerwan took for the subject of his first lecture "Practical Aviation."

Introductory to his subject, the lecturer gave a brief, but concise, history of aerostation, beginning with the experiments of the Montgolfier brothers, of Annonay, France, in 1782. Conducting his hearers through the trials of these and other pioneers of the art, Mr. Jerwan led them up to the development of the dirigible, through its various stages and a thorough explanation of the modern day dirigible of Count Zeppelin in Germany, which now enjoys a daily passenger service.

Mr. Jerwan then entered upon the subject at hand, that of "Practical Flying," and his treatment of the subject indicated careful preparation, for, while it was necessary to use considerable data and technique, the lecturer delivered his lecture in the story tellers' style, keeping his hearers in good humor by interpolating his own experiences while a novice at the game. A 5-foot working model of the Bleriot machine was used to illustrate the lecture.

A new aero club has been organized in connection with the Easton, Pa., Y. M. C. A., with ten charter members.

The officers elected are as follows: President, Harold Peiffer; vice-president, Donald Wullmuth; treasurer, Geo. Pursel; secretary, Willis K. Jones.



THE LATEST PASSENGER-CARRYING BLERIOT AEROCAR.

FOREIGN NEWS

England

TESTS FOR AIRMEN.

Special Royal Aero Club Certificate. The Royal Aero Club of the United Kingdom will grant a Special Certificate (under the rules of the Federation Aéronautique Internationale) to airmen who have passed the following tests:

A. Candidates must hold the F. A. I. Aviator's Certificate, and be entered on the Competitors Register of the Royal Aero Club.

B. The requirements are:

(1) A cross-country flight, out and back round a point situated at least 50 miles from the start. The turning point will be selected by the Royal Aero Club, and will not be indicated to the candidate until one hour before the starting time selected by the candidate. This flight shall be completed within three hours of the selected starting time.

(2) A separate altitude flight of at least 1,000 feet rise, which shall be verified by recording barograph sealed by the observers prior to the start.

(3) To glide from a height of at least 500 feet above the ground to earth, with engine completely cut off, and alight under normal conditions within 100 yards from the starting point. This glide may, at the candidate's option, be the conclusion of Test 2.

The first aviator taught to fly by a woman is Lieut. Francis E. T. Hewlett of the British Navy who was given his flying instruction by his mother at the Blondeau-Hewlett aviation school at Brooklands.

Since returning to England Tom Sopwith has been engaged in testing the Martin-Handasyde, a new monoplane of very pleasing appearance and excellent flying qualities. Judging from the performance of this machine together with the new Flanders and Bristol monoplanes, it appears that England no longer needs to send to France for successful monoplanes.

France

DIRIGIBLE HEIGHT RECORD BROKEN.

On November 6th the military dirigible balloon Adjutant Reau broke the world's altitude record for dirigibles by ascending to a height of 7,053 feet.

The altitude record for dirigibles has hitherto been held by the French dirigible Clement-Bayard, which on August 23rd, 1908, attained a height of 5,085 feet.

It is with sorrow and regret that we have to report the sad loss of Mr. Edgar Mix, who apparently jumped overboard from a channel steamer on November 11th. Mr. Mix was a well known engineer and was very popular in French sporting circles. He sprang into fame by winning the Gordon Bennett Balloon Cup in 1909, for which he entered as the only American representative, practically at the last moment. He acted as the representative of the American Aero Club in the Federation Aéronautique Internationale and was to have gone to Rome for the conference.

Flying over a course from St. Cyr to Chartres and back, Lieut. d'Aiguillon, on a Goupy biplane recently made his qualifying flights for a superior military brevet.

On November 15th, the King of Servia with President Fallieres and General Roques paid a visit to St. Cyr, and although the weather was unsuitable for flying, Lieut. Battine on his Farman and Captain Bellenger on his Blériot made flights for the entertainment of the royal guests. The King handed Captain Bellenger, on his descent, the Cross of a Chevalier of the Order of the White Eagle.

Following up our description of the French Military Aviation trials which appeared in our last issue, we herewith give a detailed list of the winners, their machines, amount of money won and the times and speeds made over the 300 kilometer course:

Winners of the French Military Competition

Pilot	Machine	Motor	Propeller.	Time for 300 kiloms			Average Speed
				h.	m.	s.	
Weymann	Nieuport*	Gnome	Chauviere	2	33	52 3/5	116:976
Moineau	Breguet†	Gnome	Chauviere	3	9	16 2/5	95:1
Prevost	Deperdussin*	Gnome	Rapid	3	21	5	89:515
Bregi	Breguet†	Gnome	Chauviere	3	26	47	87:047
Fischer	H. Farman†	Gnome	Chauviere	3	33	5	84:474
Barra	M. Farman†	Renault	Chauviere	3	56	13 4/5	76:196
Renaux	M. Farman†	Renault	Chauviere	4	8	40	72:38
Frantz	Savary†	Labor	Chauviere	4	27	49	67:210

* Monoplane

† Biplane

The amounts gained are—

Weymann (Nieuport)—	frs.
Purchase of winning machine.....	100,000 (\$ 20,000)
Purchase of 10 replicas at 40,000 frs. each.....	400,000 (\$ 80,000)
Speed bonus at 500 frs. per kilom.....	280,000 (\$ 52,000)
Total.....	780,000 (\$152,000)
Moineau (Breguet)—	
Purchase of 6 machines at 40,000 frs.....	240,000 (\$ 48,000)
Speed bonus	105,000 (\$ 21,000)
Total.....	345,000 (\$ 69,000)
Prevost (Deperdussin)—	
Purchase of 4 machines at 40,000 frs.....	160,000 (\$ 32,000)
Speed bonus	58,000 (\$ 11,000)
Total.....	218,000 (\$ 43,000)

Germany

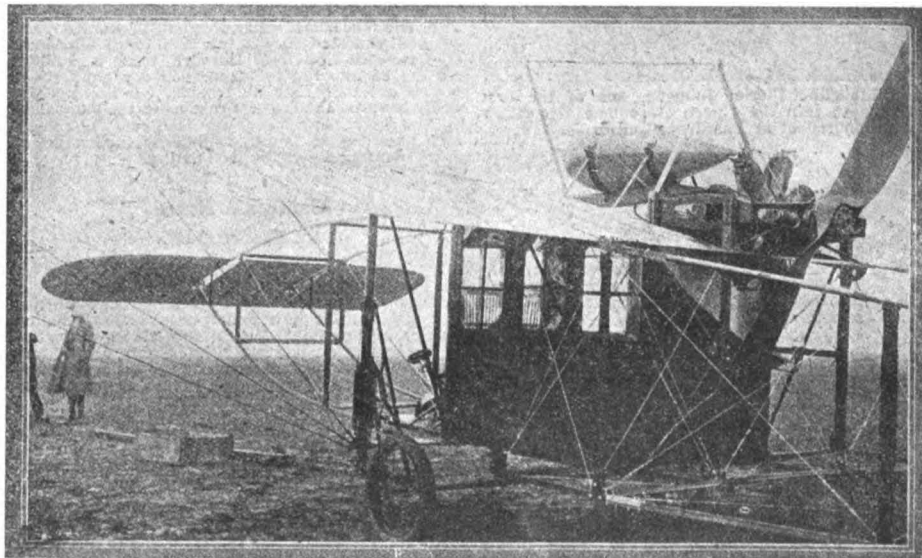
By STELLA BLOCH.

The Society of German Aerial Technicians is planning an exhibition at Berlin from December 19 to January 1st, being supported in their venture by the Aviation Ground Company Berlin-Johannisthal.

An international aero show, arranged by the Imperial Aero Club and the Society of German Motor car manufacturers will be held at Berlin next spring.

Another fatal mishap occurred in Germany on October 22nd, when Ernest Dax, who piloted an Oertz, came to grief at Hanover in the act of landing. It is believed that he was dazzled by the sun and ran into some shrubs, overturning the machine in so doing. Death was immediate.

The great German event for next year is to be a flight from Vienna to Berlin, for which the preliminary arrangements are being made. According to present arrangements only one landing will



The new Blériot passenger-carrying aerocar which was constructed to the order of M. Deutsch de la Meurthe. Note the front elevator, enclosed car with pilot's seat in front, and also the disposition of the Gnome motor, propeller and tank. The top picture on this page shows a closer view of the car and control.

be obligatory, that at Breslau, all others being made when and where the aviators see fit.

A remarkable incident occurred to two Wright flyers whilst landing during a cross-country journey in the vicinity of Berlin. They came to ground in a fine vol plane but the aeroplane hit and killed a fine young deer. The aviators were forced to come down in the midst of a hunt, which was deprived of its prey by their action. Amid general excuses and amusement they reascended for their goal proper.

Dirigible maneuvers on a large scale are being held at Cologne to last for a month. Gross, Zepelin and Parseval airships are taking part and military detachments have been sent up from Berlin and Metz.

Stuttgart will be the starting-point of the next Gordon Bennett balloon race, won this year by the German "Berlin I." in America.

A "Round-About-Berlin" flight was carried out on November 13, by Pietschker, accompanied by a passenger on a military Albatross double-decker with a 100 H. P. Argus motor. The trip, which encircled Berlin and the whole of the suburbs, lasted about two hours, counting in a landing at Schulzendorf.

Tremendous interest is being shown in the 1912 South-German Circuit starting from Strassburg either in May or June. The circular flight will lead to the most of the important South German cities. The finish has not yet been decided upon. Prince Henry of Prussia, who is on the committee, has promised a challenge cup for the event. The trophy is to invest the flight with the same importance as the Prince Henry Cup did for the automobile contest known under this name.

Bozena Lagler, the young German aviatrix, came to grief whilst flying at Prague, and is now in the hospital suffering from various fractures.

The day after the paragraph recounting Pietschker's circular flight around Berlin was written, the news arrived of his death, which occurred on November 15th at Berlin-Johannisthal where the young aviator was testing a machine of his own make. Whilst at a height of thirty metres the stabilization plane suddenly ripped away. The machine reared on end and threw Pietschker clear out of his seat. He fell to ground heavily and died in the fall as his neck was broken. The deceased, who belonged to a well known family, was only 24 years of age, and won both big events during the last National Aviation Meet at Johannisthal on an Albatross biplane.

DIRIGIBLE FOR GERMANY.

The German military authorities are planning to build an aerial cruiser with a carrying power of three hundred persons and a speed of fifty miles an hour. Its gas capacity will be ten thousand cubic metres. The plan is the outcome of the aerial maneuvers recently ended which were unusually satisfactory.

Italy

The first Italian circuit, Milan-Turin-Milan, which was recently held, was won by Manissero (Blériot), with Verona (Blériot) second. Others who took part in the circuit were: Rimini, M. Maffei, Brilli and Bighiani on Blériots; De-Gino (Deperdussin) and Kamasotto and Re (Chiribiri). The winners' time was 3 hours 16 minutes, and the distance 300 kilometres.

Mexico

While it appears that the meet held at Mexico City has been a success from a flying standpoint, it does not appear to have been such in point of attendance. Flying was accomplished almost every

day of the meet by most of the Moisant aviators, who were ably assisted in their efforts by Charles F. Willard. The feature of the meet, however, was the flight of George M. Dyott, carrying President Madero in the passenger seat of his Deperdussin monoplane. Although the flight was of short duration it was highly successful in every way and the President was delighted with his experience.

Russia

The Russian aviators, headed by Wassilieff, have formed a society for furthering and defending the interest of aviation in Russia. The members of the society have pledged themselves and machines to be at the disposal of the Government in time of war.

Tripoli

It was reported that on November 21st, the Italian military airscouts succeeded in dropping bombs inside the Turkish camp, which did great damage. Those stationed in the captive balloon were able to see the result and reported that many were killed.

In view of the success attained by the Italian airmen at Tripoli, the Italian Government has decided to send more aeroplane sections to the front. The second section consists of Manissero (Blériot), Verona (Blériot), Maffei (Blériot), and Dal Mistre (Deperdussin). The third section will consist of Cagno (Farman), Ruggerone (H. Farman), Cavalieri (H. Farman), and Rossi (Blériot). The first section which consists of Captain Piazza, Captain Moizo, Major Falchi, Lieut. Rossi and Lieut. Gavotti, have at their disposal two Blériots, two Etrichs, two H. Farman and three Nieuports.

NEWS IN GENERAL



Mrs. Madeline Blériot Johnson, one of the first pupils to join the Queen Aeroplane Company's aviation school at Pasadena, California.

New England Notes

By DENYS P. MYERS.

Official figures of the Harvard-Boston aero meet show a net deficit of \$11,221 as against a net deficit of \$23,147 in 1910. The loss will be met pro rata by the sixteen backers of the Harvard Aviation Association.

From advertising and other concessions \$4,716 was realized. A new source of income, which contributed \$11,429 to the gross receipts, was obtained through sale of tickets to the Nashua, Worcester and Providence grounds, where the cross-country flyers alighted. Gate receipts at Squantum were \$39,220; of the 26,808 paid admissions there, 5,980 represented twenty-five cent tickets.

Ordinary Seaman Daniel H. Mackney of the Naval Training Station at Newport, R. I., is working on a hydro-aeroplane, which he hopes to have completed by April next to begin flights along Narragansett Bay. The sailor, who is but twenty-three years of age, came into the Navy from his home in Terryville, L. I., nine months ago, and is now on special duty at the station by orders of the Navy Department.

Alfred Vanderbilt has joined the aviators, having brought from England an aeroplane to Oak-staked out for the purpose of aviation parties. Alexander Smith Cochran and W. Redmond Cross are among the new recruits to the sport.

Captain Washington I. Chambers, acting for the Navy Department, under which he is serving as the navy's aeronautical expert, has purchased from the Burgess Company and Curtiss of Marblehead, one of that concern's Burgess hydroplanes, the intention being to attach it to a Wright aeroplane. The Navy owns one of the Glenn H. Curtiss pontoons which has been used successfully. The main difference between the Curtiss pontoon and the Burgess hydroplane is that the former is flat bottomed and the latter is boat shaped, giving much more speed when running under full power and is especially designed for ocean service. Lieut. John Rodgers took delivery of apparatus and when it was fitted to an aeroplane tried it out successfully. A few days later at Newport, Lieut. Rodgers sailed in and out and over the ships of the Atlantic fleet in the outer bay, circled the flagship Missouri at a height of 400 feet and finally landed in the water in the lee of the battleship Ohio.

A little flurry was caused previous to the Harvard-Yale football game by Harry N. Atwood announcing that he intended to see the game from his aeroplane, owing to his inability to get tickets. The announcement caused great opposition, but Atwood persisted in his intention until President A. Lawrence Lowell of Harvard, made a personal request of him not to make such a flight. As it turned out there was no trouble, but there might easily have resulted, a test case as to the Aero Club of America's control over its licensees. The Aero Club passed a resolution forbidding such a flight, which Atwood is quoted as flouting.

California News

By ERNEST OERT.

What promises to be a great help to aviation on the Pacific Coast is the newly organized California Aviation Company of San Francisco. Two Curtiss type biplanes are now under construction both of which will be equipped with Roberts motors. One of the machines is being built for Miss Margaret Murphy, who has become well known in aviation circles through her flights with Weldon B. Cooke, the daring Oakland aviator.

The California Aviation Company has secured a large field for practice grounds near San Francisco, and are making arrangements with several competent drivers for flying instructors. A hangar 40 by 40 feet is being built upon the grounds.

Weldon B. Cooke made many fine flights at Stockton, California, on November 23d. Mr. J. B. Seeley, of the Roberts Motor Company, witnessed the flights of Cooke and was greatly pleased.

Walter Edwards, of San Francisco, has been making several fine flights at Madera, California, in his Curtiss type biplane.

Ray M. Francis, the latest arrival at Calvara Flat, has been making many fine flights lately in his Gage biplane. He has been taking up many passengers and at San Jose on November 30th, he took a newly wedded couple up. His Gage biplane, which is of the Farman and Curtiss type, is of splendid workmanship. The biplane is equipped with an 80 H. P. Hall-Scott motor. Francis is now making an exhibition tour of California.

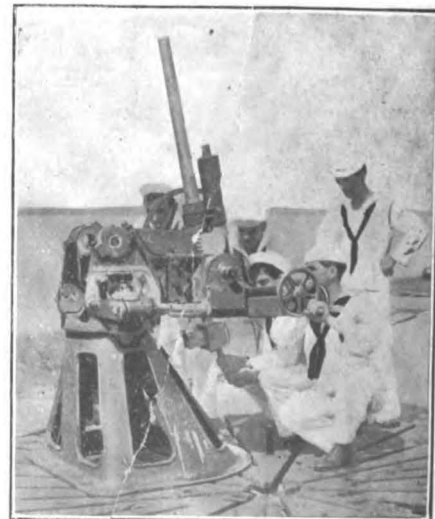
It is proposed to have an aviation meet in San Francisco the latter part of December. Hughes Simon, manager for Grahame-White and Tom Sopwith, is in San Francisco, and are helping to arrange matters.

The dirigible airship built by C. H. Toliver of San Diego and which has been under construction for over a year, failed to fly. It was built to carry forty passengers.

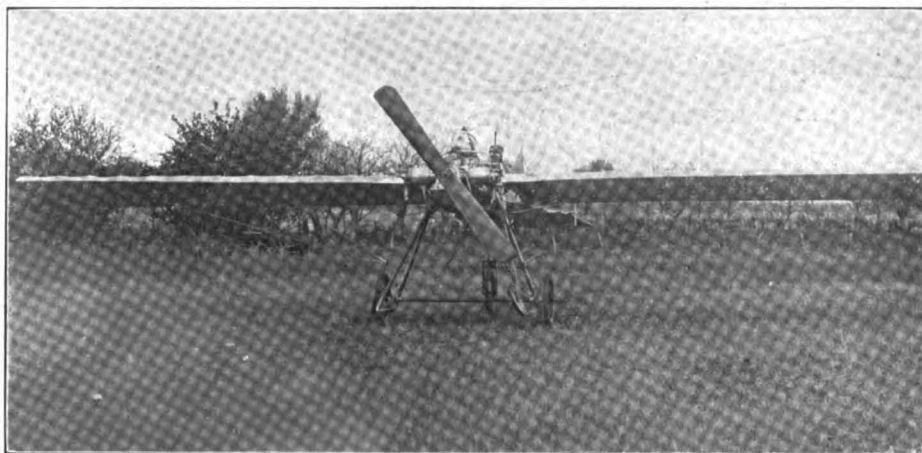
Tom Cunn, who claims to be the only Chinese aviator in the world, is at present in San Francisco negotiating with the Chinese revolutionary leaders for dropping bombs from his biplane which is a combination of the Farman, Curtiss and Wright types.

Mrs. Lillian Janeway Atwater, widow of Senator Platt has purchased a hydro-aeroplane, which she is learning to pilot under the tuition of Glenn H. Curtiss at the training school near San Diego. It is Mrs. Atwater's purpose to fly for pleasure.

On their honeymoon journey Mr. and Mrs. Atwater came to California so that the bridegroom could purchase an aeroplane and learn to fly it. Mrs. Atwater became so enthusiastic that she determined she also would learn to fly. Both are now flying their craft daily at San Diego.



NEW NAVY AERIAL GUN.



THE CALL MONOPLANE EQUIPPED WITH A CALL MOTOR.

The Call Monoplane

The Aerial Navigation Company of America, of Girard, Kansas, besides manufacturing the Call Aviation Engine, has recently turned its attention to aeroplanes. In fact, it was with this ultimate object in view that the manufacture of the engine itself was originally undertaken.

The Call monoplane weighs 800 lbs., without fuel or operator, has a main supporting surface of 210 square feet, and is equipped with a 50 horsepower Call Aviation Engine, turning a propeller 8 ft. 6 in. in diameter, of 6 ft. pitch, approximately 1,200 revolutions per minute.

Repeated shop tests showed a thrust of fully 600 lbs., with a later propeller, turning 1200 revolutions. One of these tests was with a 400 lb. dynamometer anchored to a stake, and attached by guys to rear of monoplane. The thrust obtained was sufficient to register the full capacity of the dynamometer—400 lbs.—in addition to the power required to propel the ship forward, with three persons on board, and to overcome the head resistance engendered by the 80-mile-per-hour wind current from the propeller—estimated at not less than 200 lbs.

Trial work will be continued throughout the winter. With the remarkable showing made by this power plant, the Call Aeroplane and Call Aviation Engine will undoubtedly be heard from to some purpose in the exhibition and prize field during the coming season. It is the intention and plan of the Company to also open regular traffic and passenger lines in the near future.

The Winner

Mr. Raymond W. Garner, of Davenport, Iowa, has been awarded the \$25.00 offered by the X. Company, of Detroit, for a name to replace "propeller." The name "Spiron" selected is a modification of his suggestion.

The X. Company reports that a widespread interest was taken in the contest and that suggestions were received by them from all parts of the world from prominent aeronautical writers and aviators who commented on the unsatisfactory word "propeller." Some of the substitutes for the word "propeller" suggested were "club, blade, stick, fan, and wheel," now in use at various aeronautical fields.

Nassau Boulevard

In spite of the inclement weather of the past month activity continues at Nassau Boulevard and almost every day the aviators are out practising in spite of the snow.

The sensation of the month has been the trial of Lester Weeks in the Dietz parplane, a semi-circular machine with a large hollow tube in the centre in which is stored a parachute for emergency purposes. In spite of the peculiar appearance the machine has proved itself a flier. The motor used is a 60 H. P. 6-cylinder Kirkham which furnishes power enough to enable the machine to rise from the snow on its skids alone.

Others who have been making good flights at the field are Oliver B. Sherwood and Frank Cline.

Mineola News

During the past month at Mineola considerable flying has been indulged in by the many private experimenters located there.

Captain Baldwin has converted his biplane into a comfortable passenger-carrying machine, having placed the passenger seat directly behind the pilot instead of by his side as heretofore.

Frank Boland is continuing his experiments with his tailless and rudderless biplane and the way he handles the machine in the air has been a revelation to the other aviators.

Stanley Y. Beach is installing a new and novel engine in his Bleriot. The engine was designed by S. Ashmundson and is an eight cylinder affair of the double opposed type.

Grahame-White Gets Statue of Liberty Prize

The Federation Internationale Aeronautique at its meeting at Rome, Italy, on November 26th, awarded the Statue of Liberty \$10,000 prize to Claude Grahame-White.

This prize, it will be remembered, was first awarded to the late John B. Moisant and after his death, to Jacques De Lesseps. It was, however, protested by Grahame-White, but it was claimed that he had fouled a pylon and therefore under the rules was not entitled to the prize. Grahame-White has claimed all along that he did not foul a pylon and as there is some doubt of his having done so, the decision was reversed.

Curtiss Doings

Captain Washington Irving Chambers, who has charge of Navy aviation affairs at Washington has accepted the invitation of Glenn H. Curtiss to observe the experiments now in progress at the Curtiss winter training grounds on North Island, San Diego, Cal. Captain Chambers will spend several days at Mr. Curtiss' experimental station.

Major Bell, Chief of the United States Signal Corps, has made known his intention to detail several Pacific Coast army officers to North Island for the purpose of studying aviation under the direction of Mr. Curtiss.

A carload of aeroplane equipment arrived at San Diego, Cal., recently from the Hammond-Port factory. A second carload is on its way.

It is stated that the Curtiss Company received an order from the Russian Aerial League for a two-seated Curtiss hydro-aeroplane of the duo control type. The Russian Aerial League is an organization formed to further and develop a Russian aerial fleet.

In addition to the above order the Curtiss Company also reports the sale of one of its machines to Dr. Charles S. Decker of Binghamton, president of the Aero and Automobile Clubs of that city.

It is reported that Curtiss has constructed a hydro-aeroplane rescue machine which is equipped to carry twelve men. Should this latest device prove successful it will show conclusively the great value of the hydro-aeroplane for war purposes, as a means of transportation and for rescue work.

Louis Paulhan, the French aviator, spent a few days in America recently and signed contracts with the Curtiss Company whereby he controls the exclusive agency for the Curtiss aeroplanes and hydro-aeroplanes in France.

On December 2d, Tod Shriver was killed at Ponce, Porto Rico while flying a Baldwin biplane. For some unexplained reason the machine is reported to have fallen 200 feet into a cane field and injuring poor Shriver so badly that he died on the way to the hospital. Shriver was well known in American aviation circles and was a particular favorite at the aviation colony at Mineola.

When Curtiss went to France and won the first International cup race he was accompanied by Shriver who acted as his chief machanician. At Mineola last year he built the Shriver-Dietz biplane and learned to fly in a remarkably short time. Shriver, although usually a careful flyer, at times was inclined to be a little too reckless for safe flying.

Activity still continues at Marblehead, Mass., where the Burgess-Curtiss headquarters are located. Philip W. Page and Clifford L. Webster have been making almost daily flights in the Burgess hydro-aeroplane. During several of Webster's trips a moving picture machine and operator was carried and several pictures taken.

Greely S. Curtis, who has been an active partner of W. Starling Burgess for the past two years, is now learning to fly one of their hydro-aeroplanes.

Wright Company Affairs

A most interesting announcement which shows the important improvements that can be expected in future aeroplanes, has just been given out by the Wright Company. This concern states that their 1912 models, besides embodying their present well-known features, can be furnished with automatic control, silent motors and hydroplanes, all features which should make these machines specially attractive to sportsmen.

It is a pleasing matter to mention the fact that there has not been one fatal accident during the year 1911 to a Wright Company aviator, notwithstanding that the Wright aviators were continually flying in all sections of the United States.

On December 12th Judge Hand, in the United States Circuit Court at New York, granted an injunction to the Wright Company to restrain Claude Grahame-White, the English aviator, from flying in this country without permission from the Wrights and directed him to render an accounting of profits from his flying since November 29th, 1910, the date the Wright Company brought suit, and the following day the Wright Company served papers on Mr. Grahame-White in another suit to endeavor to obtain a portion of the profits from flights made by Grahame-White prior to November 29th, 1910.

Tests lasting four days of the Wright brothers' aeroplane motor have been completed in the laboratory of the Automobile Club of America. This is the first trial in the \$1,000 prize contest, entries for which closed September 10 last. The results of the trials will not be made known until the competition has been completed. Wilbur Wright ran the motor during the tests, which were made by Herbert Chase under the direction of the Technical Committee of the club. The motor is that in use on the Wright biplanes.

The Wright motor is of the four cycle water cooled type, having four cylinders of four- and three-eighths inch bore by four-inch stroke. It is rated at thirty to thirty-five horse power.

The tests included a run of three hours' duration at constant speed, starting from a standstill, and again while the engine was turning over slowly, and other tests to determine reliability, flexibility, fuel economy, power, freedom from vibration and lubrication efficiency.



A NOVEL AMERICAN MACHINE. THE SLINN BI-MONOPLANE.



INSPIRED BY AIRCRAFT.

IN the December *AIRCRAFT*, which was published on the 20th day of November, we ran a trade note in which we stated that the Wolverine Aeronautic Company of Albion, Mich., had just finished the construction of a biplane which was intended for the Chinese Revolutionary party, and on November 24th—four days later—a Cleveland newspaper published a story in which it was claimed that the Chinese Revolutionists were assembling a fleet of airships for an attack on Peking and that some of them were to be made in Cleveland while some were to be made at Albion, Mich., by the Wolverine Aeronautic Company.

The whole story was quite cleverly arranged and no doubt proved interesting reading matter but judging from its contents there could be no doubt that it was inspired by *AIRCRAFT*, in fact it even went so far as to reproduce a copy of some Chinese writing which *AIRCRAFT* published on page 80, volume 2, May issue.

Now we have no objection to newspapers in any part of the world taking their cues from *AIRCRAFT*, in fact the aeronautical Editors on every up-to-date

newspaper in the United States use *AIRCRAFT* as an encyclopedia from which they obtain their facts and figures. This is all right and as it should be, but we think that it is no more than fair that when they use our stuff they should at least state from whence it came.

ALL indications point to a very brisk aeronautical trade during the year of 1912 and already manufacturers and supply houses throughout the country are making preparations to take advantage of what promises to be a prosperous season. Therefore we call the attention of advertisers to the fact that the next number of "Aircraft"—the February issue—should be an exceptionally good one to advertise in, for not only will it be the forerunner of the Spring trade, but also the index number of Volume II., the number in each volume which is referred to the greatest number of times by readers. Advertisers should remember, however, that the February "Aircraft" is published on the 20th day of January and that advertising forms close on the 10th day of January, and act accordingly.

The Sloane Aeroplane Company has been organized under the laws of the State of New York.

This concern, which apparently is well backed financially, will in the future manufacture both monoplanes and biplanes as well as spare parts for almost any make of machine. It is also their intention to have a repair shop to be used exclusively for repairing disabled aeroplanes. Their manufacturing plant is one of the most complete in the United States.

The Queen Aeroplane Company has opened up its winter aviation school at Pasadena, California, under the general management of Ladis Lewkowicz, who also acts as general instructor of flying.

Work on the hangars is now being pushed rapidly and by the first of January it is expected that the school will be in good working shape.

The first student enrolled was Mrs. Madeline Bleriot Johnson.

The flying ground contains one hundred and sixty acres of perfectly flat land at the foot of the hills and is well protected from the winds by being thirty miles from the ocean.

The C. E. Conover Company, of New York, manufacturers of the much used Naiad aeronautical cloth, report a large increase of sales for the year of 1911 over the year of 1910, and that they anticipate doubling their 1911 business in 1912.

They also report that some of the cloth they sold two years ago is still doing good service. They are, however, still experimenting and have prepared an even better fabric than that which has brought them in such good results during the past.

Maximotor Makers of Detroit, have engaged the services of a celebrated Detroit automobile designer to co-operate with the Maximotor designed by Mr. Dingfelder. The latter is said to have been the first to drive an automobile on the streets of Detroit which to-day are choked with automobiles, and also the first to introduce the spark plug into the United States.

Among the recent purchasers of Maximotors is Mr. Lewis Matthews, official and part owner of the Maleable Stove Works of South Bend, Ind., who has now resigned to invest in an aviation enterprise.

Geo. H. Smith has just installed a model 2 Maximotor in the Bleriot he had built by the National Aero Co., of New York City and Long Island.

Reports from Honolulu indicate considerable activity by F. A. Schaefer, of the well-known importing firm of G. E. Schaefer & Co., Ltd. His Maximotor plane is believed to be the sole aeroplane between San Francisco and Yokohama.

Nels J. Nelson, of New Britain, Conn., who has flown at fairs and gala day celebrations through eight States since he received his 40-50 h. p. Maximotor at the beginning of September, states that his engine has returned ten times its cost in that time. There has been nothing in the way of accident to mar his good fortune.

Mr. Nelson is going to hibernate in New Britain and build another plane for next year.

John A. Roebling's Sons Co., of Trenton, N. J., report that the demand during 1911 for wire cords and wires for stays for aeroplanes has exceeded that of any preceding year.

In addition to supplying large quantities of such cords and wires, the Roebling Company has filled many orders for flexible wire cords for steering gear.

All wire must be of the highest quality, the inventors and manufacturers of aeroplanes demanding the severest tests which can only be met by careful and intelligent treatment of the best grade of metal.

There has recently been a considerable increase in the demand for "Kirkham" motors and a large number of orders have been booked for future delivery. Indications point to a considerable activity in the sale of motors during the winter and spring months.

Capt. Hugh L. Willoughby, of Newport, R. I., and Sewalls Point, Fla., has recently received delivery of a 6-cylinder "Kirkham" Motor to be installed in his hydro-aeroplane, the "Pelican."

Motors have also been delivered during the past month to Aviator James V. Martin and the Chicago Aeroplane Mfg. Co.

Recently W. F. Cline, in the A. N. Ridgely plane, equipped with a 6-cylinder "Kirkham" motor, flew 16½ minutes at Nassau Boulevard. Ascending in the fast approaching darkness and flying on a schedule he descended only on being signalled down, and it was then so dark that it was necessary to burn a considerable quantity of gasoline on the field in order that he might safely alight.

The New York Aeronautical Supply Company report that in spite of the winter season orders are coming in thick and fast. A large percentage of these orders are for supplies for machines which are to be built during the winter months. A new addition to their line is the Roberts motor which is made in two sizes—four and six cylinders.

This enterprising concern is now building a Curtiss type hydro-aeroplane in which they intend to demonstrate their engines in the Spring and Summer months.

Mr. W. E. Watts, the president of the company, has just returned from a trip through New England and Canada, and reports the outlook for next season as very bright in these respective territories.

At a recent meeting the **Chelsea Aeroplane Company**, manufacturers of the famous Charavay propellers, was taken over by the Sloane Aeroplane Company, and the following officers were elected: President, John E. Sloane; vice-president and chief engineer, Kingsford Goodman.

Owing to the constantly increasing demands for the Charavay propeller, the company has moved its manufacturing plant to a larger factory located in Brooklyn, N. Y., where they have greater facilities for turning out propellers and patterns. The offices of this concern, however, are located at 1737 Broadway, New York.

This company will have two standard types of propellers for 1912, the "Charavay" and the "Charavay Normal." The first is the same type that they have been turning out for the last few months while the "Charavay Normal" is an entire-

ly new design which is claimed to give even better results than the "Charavay."

Mr. Harry B. Wise is connected with the sales department of this company.

The E. J. Willis Company of New York, have recently placed upon the market an extra large turnbuckle with locking device preventing loosening of the turnbuckle and slackening of the cable around engine section of the biplane. This company announces that so large has been the volume of their business lately that their stock of aeronautical catalogues has become entirely exhausted by the demand for them, showing the great interest manifested in aeroplane construction throughout this country at the present time.

The American Propeller Company reports a most satisfactory condition of trade in their well known Paragon propellers, especially considering the approach of the winter season. They report a most excellent export trade, to a considerable extent compensating for the inevitable falling off of their regular trade during the colder months. It is a matter of much gratification to this company to know that their product is becoming known and appreciated in foreign countries for the same excellent qualities which make their propellers so popular here. A considerable portion of their foreign trade is reported as being with foreign governments and belligerent parties under circumstances which forbid publication of full details.

The hydro-aeroplane built by the Burgess Company & Curtis has been in active service since its first installation and during the last month over fifty flights have been made, on most of which passengers and pupils have been carried.

On December 4 the set of hydroplanes for the Navy Wright machine were shipped to Annapolis, after they had been thoroughly tried at Newport in maneuvers with the Atlantic Squadron, where Lieutenant Rodgers delivered a message from shore to the battleship Ohio lying to some miles off awaiting orders.

Among pupils being trained are H. H. White of the University Press of Boston; H. J. White, of Baltimore, Md., and G. W. Roosa, of Lynn. Among ladies carried recently are Miss M. E. King and Miss Curtis, of Boston; Miss M. Wainwright, Miss F. Webster and Mrs. G. H. Webster.

On November 27 a flight was made over Marblehead harbor with a moving picture machine for the Aviation Film Company, results of which were highly satisfactory.

On December 6 the hydro-aeroplane was used for the first time to go duck shooting. Mr. Sam Hathaway took out his rifle and with Mr. W. Starling Burgess as operator flew along the coast looking for ducks. A number of shot were made, but as it is difficult to shoot a duck with a rifle the hunters returned with an empty bag.

On the evening of the same day Mr. Webster continued his training on into the evening, finding no difficulty at all in operating under the full moon. Eight flights in all were made during the day.

On December 8 eleven flights were made.

December 9, Harry N. Atwood in behalf of the Clayton and Craig Aviation Schools, takes delivery of the first of his Burgess hydro-aeroplanes. This machine will be used not only in active training work, but as Mr. Atwood's own service hydro-aeroplane.

The shops are busy filling rush orders for hydro-planes, as well as regular orders for Burgess machines.

A Burgess aeroplane and Burgess hydro-aeroplane have been shipped to Los Angeles for winter training. The work will be in charge of Mr. Howard W. Gill, present holder of the American endurance record. The selection by Mr. Gill of the Burgess machine was made after a very careful study of the market as he wished to obtain a type thoroughly satisfactory for general work.

The company will also have a school located in Florida to be opened about January first, definite notice of which will be made later.

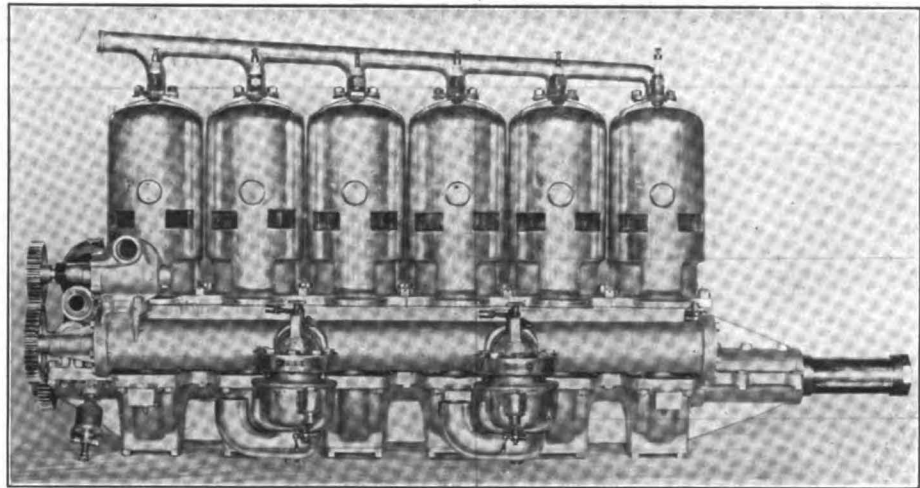
The Roberts Aeroplane Motor

This motor made its first appearance on the aviation field the first of June and has risen rapidly in favor of aviators in general until now it is one of the leading aviation motors of American manufacture.

In the five months, from June first to November first, The Roberts Motor Co., of Sandusky, Ohio, sold and delivered over fifty motors.

The Roberts model X aeroplane motor is built in two sizes, four-cylinder 50 H. P. and a six-cylinder 75 H. P. The motors are $4\frac{1}{2}$ " bore by 5" stroke and give their rated H. P. at 1150 r.p.m. They are of the two-cycle valveless type, and fitted with a rotating cylindrical valve or distributor between the carbureter and crank case so as to give more perfect control of the mixture than can be obtained with the ordinary third port opened and closed by the bottom edge of the piston.

This valve is gear driven at the same speed as the engine and actually proves in use that it shows that the valve performs its function in an admirable manner. The valve gives an exceptionally perfect distribution of the mixture to the various crank cases.



INTAKE OF NEW 6-CYLINDER MODEL X ROBERTS 75 H. P. MOTOR.

Another feature of the Roberts Aeroplane Motor is the method of advancing the spark. It is well known that with the ordinary magneto advance obtained by turning the circuit breaker a spark of maximum intensity is obtained only at one point in the priming.

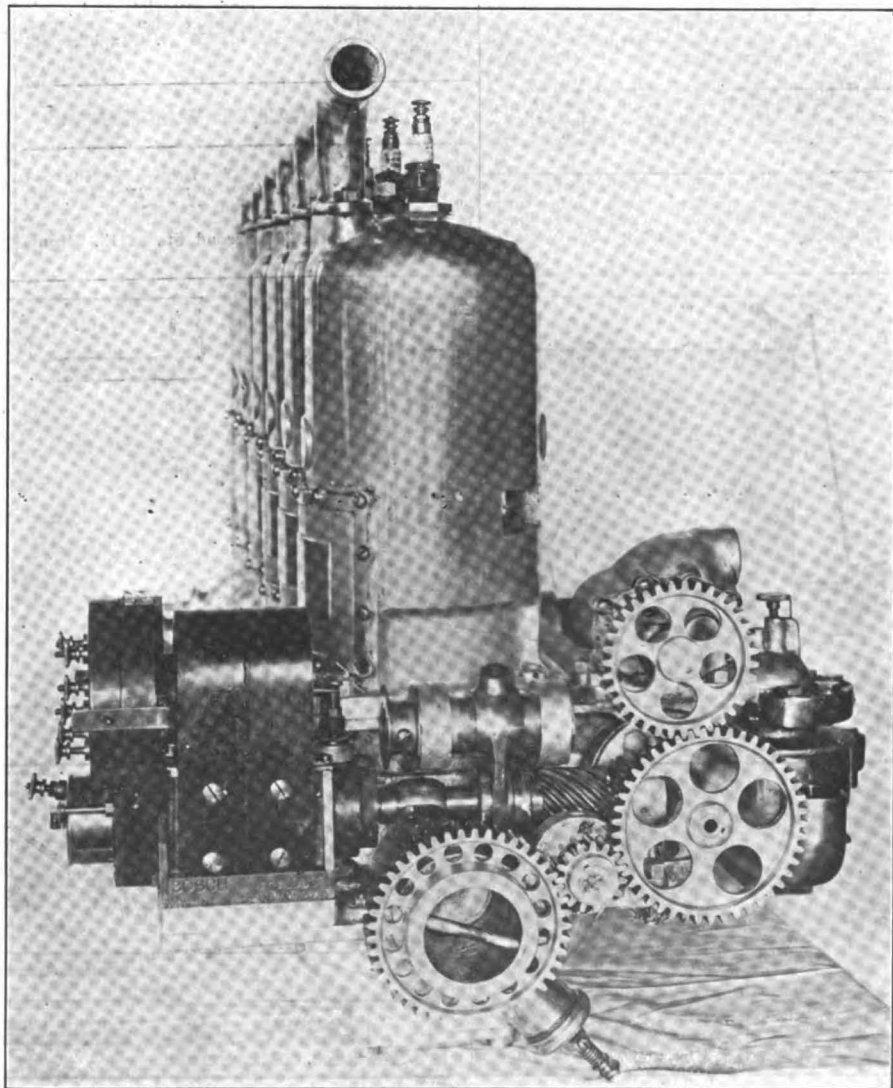
In the Roberts Motor a fixed spark magneto is used and the advance is obtained by rotating the armature of the magneto in relation to the drive. This is accomplished by sliding the spiral or helical gear and no matter what the position of the spark, it is of the same intensity at any point of the advance. This gives a hot spark and makes starting much easier than with the ordinary magneto advance. Furthermore it eliminates the danger of back kick because it is not necessary to advance the magneto to make starting easily.

Another unique feature of the Roberts Motor is

the use of a special alloy imported from Germany for the cylinders. This alloy while no heavier than aluminum is exceptionally tough, has a high tensile strength, more than that of cast iron. This permits the use of a solid casting for the cylinder and better distribution of the water than can be obtained when separate jackets are used.

The weight of the four-cylinder 50 H. P. motor is 170 lbs., including carbureter and magneto, and that of the six-cylinder 75 H. P. motor, 240 lbs. complete.

So great has been the success of this motor in the aeroplane field that the Roberts Motor Co. are now getting out a larger motor, a six-cylinder $5\frac{1}{2}$ " x 6", rated at 125 H. P. which will weigh complete about 400 lbs. This motor will be ready for delivery about the first of the year.



END VIEW OF ROBERTS 6-CYLINDER MOTOR, SHOWING MAGNETO AND PUMP GEARING.

CLASSIFIED ADVERTISING

10 CENTS A LINE SEVEN WORDS TO LINE CASH WITH ORDER

FOR SALE

IF you want passenger balloons, dirigibles, captives or aeroplanes; large stock; immediate shipment; any size built to order. Teach purchaser to operate. Exhibitions furnished throughout United States and Canada. G. L. Bumbaugh, builder and operator. Indianapolis, Ind., U.S.A.

CURTIS latest improved type (Pigeon tail) 1912 Model. Made over 300 very successful flights 1,000 ft. high, 30 miles cross-country. My construction is strongest in the world. New, complete, ready to fly, tested and guaranteed, including free lessons to buyer, \$2,500. Buy direct from Builder and Aviator of 10 years' experience. H. C. Cooke, Aviator and Builder, 128 West 65th St., New York City.

WOULD like to sell my patent for a dirigible airship, latest construction, or would like a capitalist to build a small or a large airship. The airship consists of 7 aeroplanes and 12 balloons. You can cross the ocean to France or Germany. The aeronaut can land on the water and can also fly against the strongest wind. Model to be seen at G. Scheel, 418 East 9th St., New York City.

GENUINE Glenn H. Curtiss aeroplane, good as new. Plane or 4-cyl. Curtiss motor separate; will ship for inspection; cash or part payment to responsible party. George Russell, 1370 Broadway, Room 17, New York City.

IT DEPENDS on the motor. "A Good Model," plus An Adequate Motor "Equals Success." The Cellulose Turbine is an internal combustion turbine, designed for model aeroplanes. It delivers 1/4 horsepower, from 1 to 3 minutes. Complete plant 1/2 pound. Price \$2.00. Correspondence invited. Co-Operative Aero Association, Muncie, Indiana.

FOR SALE—One 50 H. P. DeChenne Power Plant complete. Cheap if taken soon. Reason, have closed for season and can make more by spring. DeChenne Motor & Aeroplane Co., Monett, Mo.

FOR SALE—Curtiss Type Biplane complete and set of extra planes, \$100.00. Good workmanship (Broke contract). Address Box 752 c/o AIRCRAFT.

THIRTY perfect photographs of prominent aviators, machines, flights, etc.; interesting, authentic descriptions; \$1.00 Sample; six photographs, 25 cents. Aero Specialty Co., Revere, Mass.

FOR SALE—One Requa-Gibson propeller, 7 ft. diameter, 6 ft. pitch \$35.00
One French propeller type 8.097 ft. diameter, 3.987 ft. pitch 50.00
One French Propeller type 8.097 ft. diameter, 3.45 pitch 50.00
One Dean Mfg. Co. propeller type 6 1/2 ft. diameter, 4 3/4 ft. pitch 50.00
The above French propellers were made in France, are made of the very best of material and workmanship. The price F. O. B. Paris is \$100.00 each.

1 50 H. P. Harriman engine, 4 cylinder, 4 cycle. This engine sells for \$1,650.00, our price \$700.00. This includes a complete power plant.
1 6-cylinder, 2 cycle, 48 H. P. engine, \$775.00. This includes radiator propeller and high tension magneto. This engine sells for \$1,500.00.
We are closing out our business and must sell. LeBron-Adams Aeroplane Co., Omaha, Neb.

WE HAVE for sale the basic Butusov patent issued in 1898, covering hinged wings, dipping planes, horizontal and vertical rudders, hydroplane, etc. This patent resulted from the early extensive developments by Octave Chanute and Wm. P. Butusov, under contract, June 25th, 1896, which we have. The Scott-Rose Company, 1651 Marquette Bldg., Chicago, Ill.

BARGAINS—Integral Propellers, 6 ft., \$16 up. Perfect balance, material, workmanship guaranteed. J. C. Press, So. Norwalk, Conn.

AVIATION," the best book on AVIATION. The First Lessons on Aeronautics. Most scientific treatment on the subject. Illustrated. Prepaid \$2.00. Ostergaard Aero Co., 1830 North Sawyer Ave., Chicago, Ill.

NEW BLERIOT MONOPLANE, almost completed, \$600; first class materials and workmanship used throughout; can be seen at any time. Call or write. M. R. L., 26 N. Franklin St., Hempstead, N. Y.

CO-OPERATION WANTED

PARTNER WANTED—To furnish engine for latest type 30 ft. Curtiss aeroplane for one-half interest. Plenty of contracts waiting. Weight of machine 375 lbs. For further particulars, address S. C. Moore, 200 Second St., S. E., Minneapolis, Minn.

AVIATOR, young American; experienced with Blériot; desires financial assistance; will fly other model if desired. Box 751, AIRCRAFT.

POSITIONS WANTED

A YOUNG MAN, age 18, desires position as an aviator's assistant, with prospects of learning to fly. Address, Louis Fenouillet, 132 West 47th St., New York City.

MECHANIC who has been doing some aeronautical experimenting; thorough gasoline Engineer Machinist and Automobile Driver, wishes position as helper to aviator or firm. Address C. B., % AIRCRAFT.

YOUNG MAN, 22, desires position with aviator or firm. Have had practical experience. Reliable, steady and sober. Unquestionable references. Address, Aviation, 132 Howard Ave., Brooklyn, N. Y.

MISCELLANEOUS

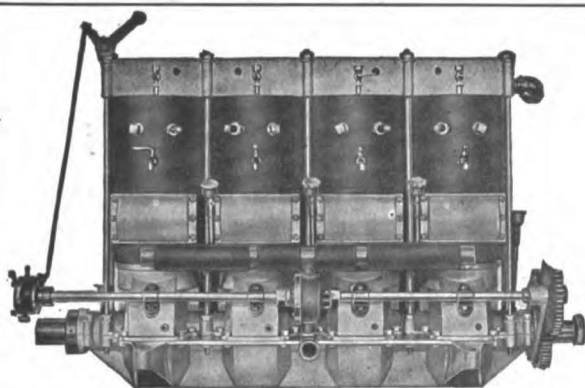
WANTED—Small factory or shop with facilities for light woodworking in good manufacturing location. Middle West or near New York. Full particulars. Box 2476, Station G., Washington D. C.

WANTED—Thoroughly experienced and licensed aviator to act as instructor. State salary and references. Address, National Aeroplane Co., 2023 Michigan Ave., Chicago, Ill.

AVIATORS' DIRECTORY

REYBURN, Amedee V. Jr., with Blériot one hundred horse power monoplane, is now booking engagements for exhibition flights. For particulars apply to 5305 Delmar Boul., St. Louis, Missouri.

LEARN TO FLY \$100 REQUIRED
GATES, 227 Englewood Ave., Chicago, Ill.

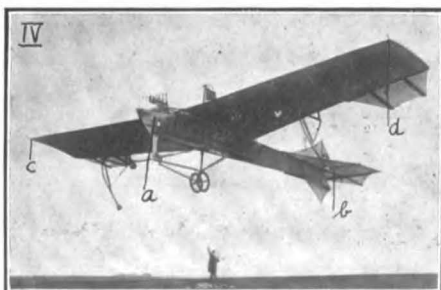


AEROPLANE MOTORS 40 to 50 H. P.
H. J. LEIGHTON, 1017 West Fayette Street
SYRACUSE, N. Y.

WIRE

Aviator Wire supplied in 12 sizes with a plate finish making soldering easy. This wire is specially drawn from extra quality high grade steel. Also Aviator Cord of twisted wire. :: :: :: ::

John A. Roeblings Sons Co.
TRENTON, N. J.



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Half-tones appearing in any previous number of *Aircraft*, still in stock, for sale at the low rate of 5 Cents per Square Inch, 75 Cents minimum. Sent Postpaid, for Cash Only
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POSITION

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NEW YORK

BLERIOT MONOPLANE CO., Inc.

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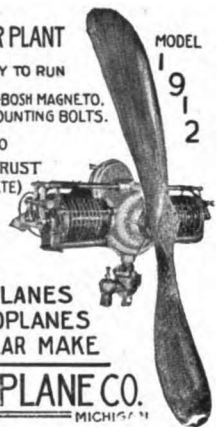
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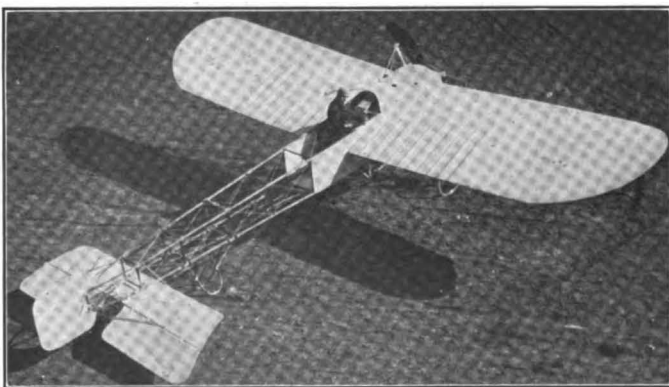
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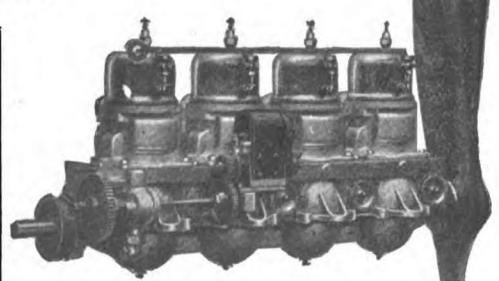
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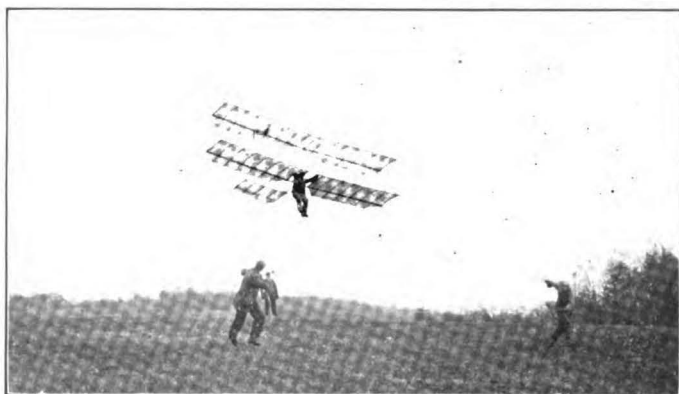
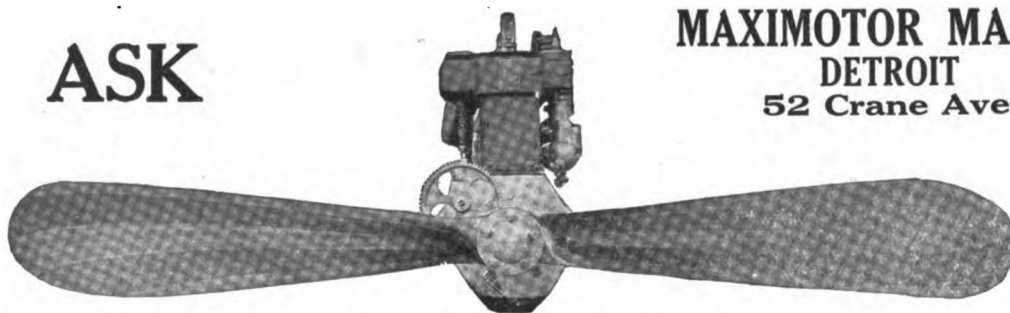
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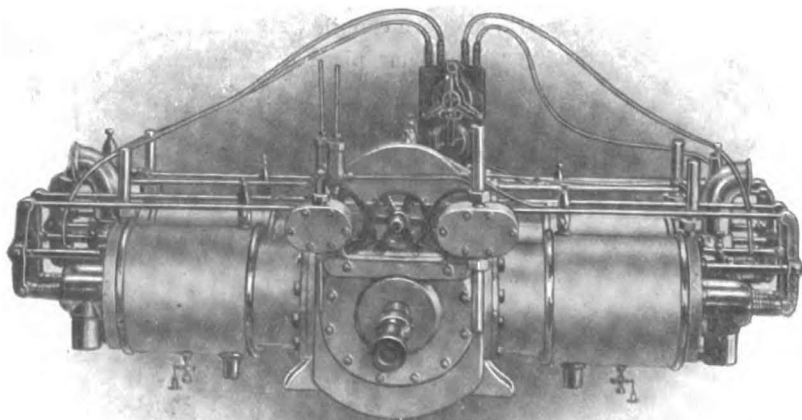
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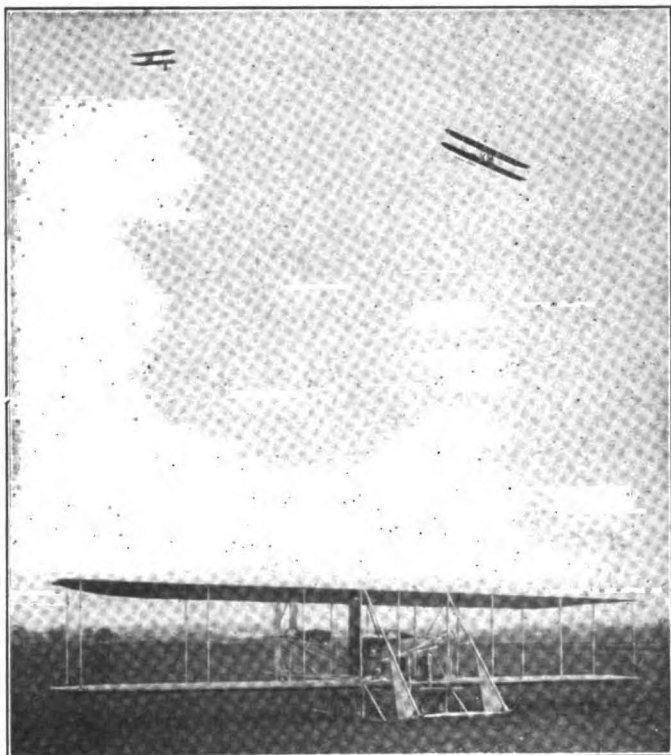
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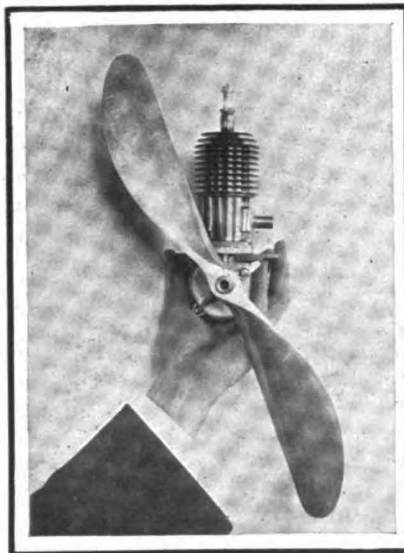
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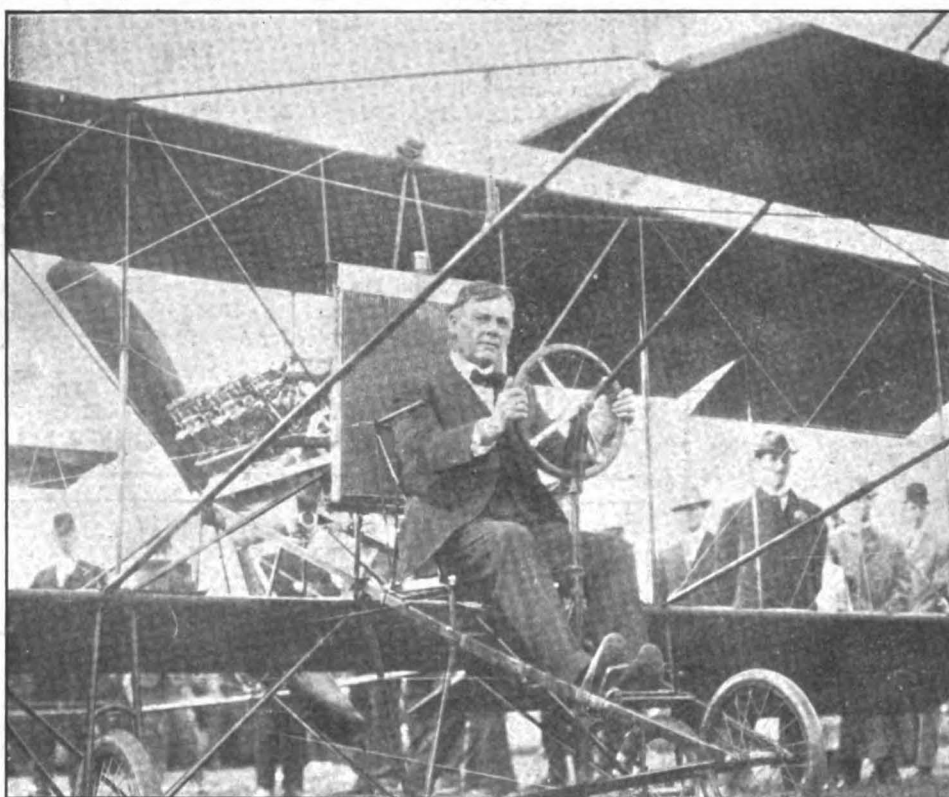
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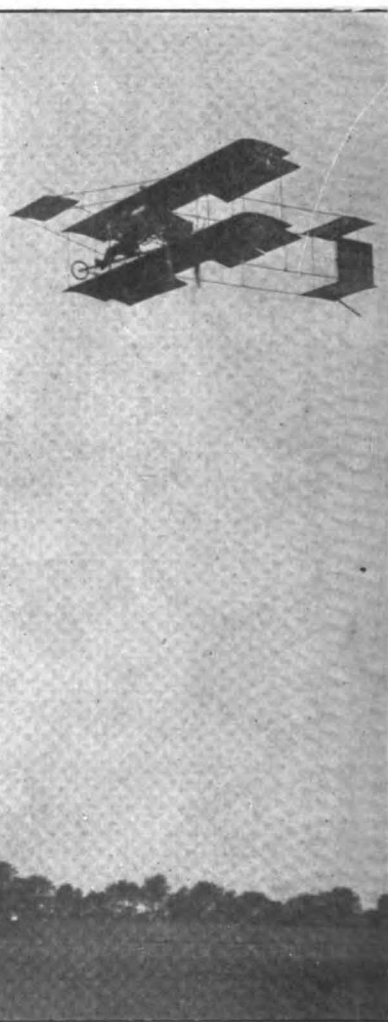
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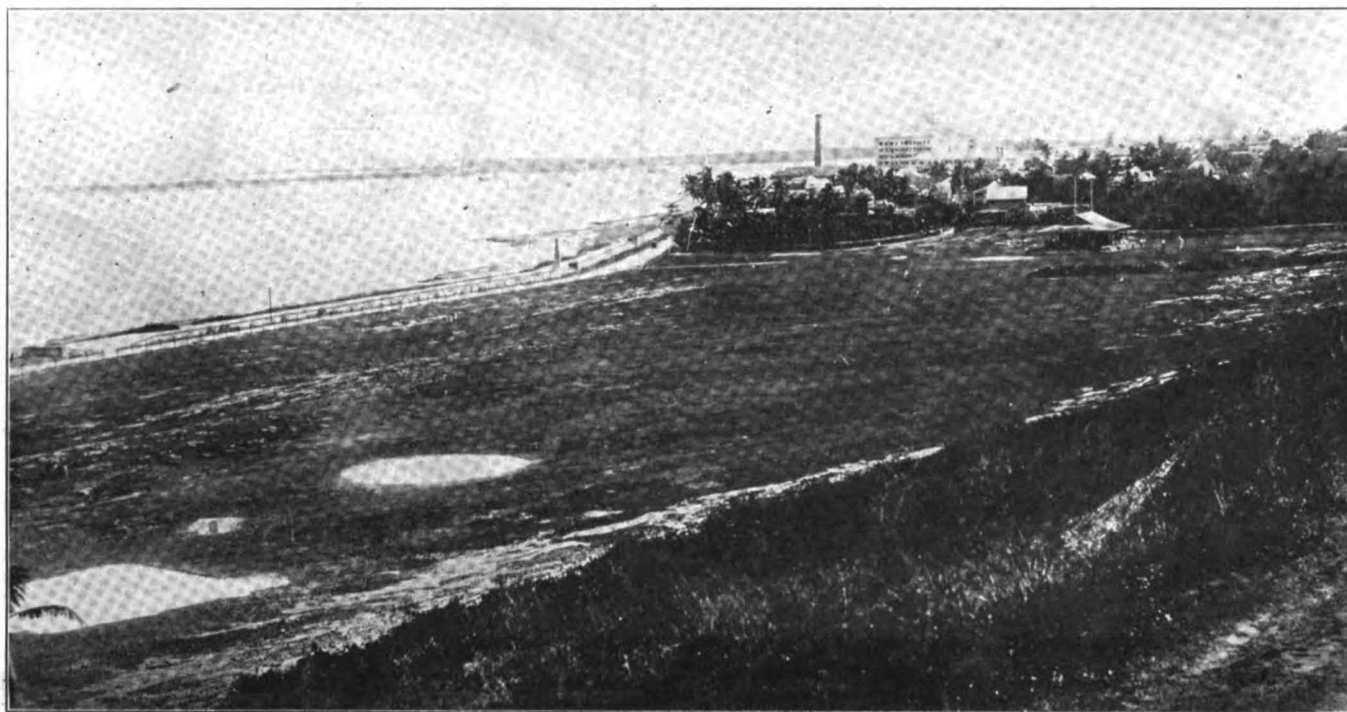
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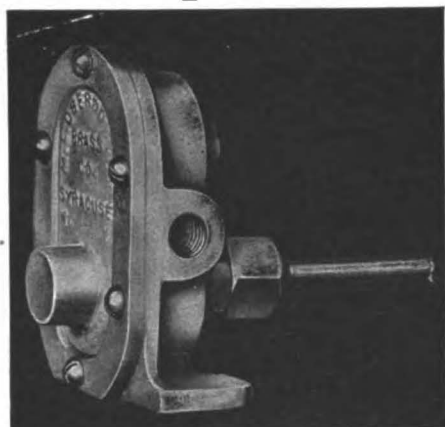
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Curtiss Seats	\$5.50	Oval Post Sockets	\$0.17
Curtiss Steering Wheels	\$9.00		
5 Gallon Tanks	\$6.15	Out Rigger Fittings	\$0.29
Aluminum Pulleys with Brass Bushings			
2"-2½"-3"-25c., 30c., 40c.			
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NOTE—Beginning January first we have established, under the personal direction of Mr. Spencer Heath, a special consultation department for giving competent engineering advice upon matters relating to propellers and power equipment generally. This department is at your service.

AMERICAN PROPELLER COMPANY
WASHINGTON, D. C.

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"KIRKHAM" AVIATION POWER PLANTS FOR SEASON OF 1912



Model B-6 installed in "KIRKHAM" Tractor Biplane

THE "KIRKHAM" AVIATION MOTOR IS OFFERED IN FOUR DIFFERENT MODELS :

Model B-4,	35 H-P.,	4-cyl.,	weight, 185 lbs.
Model B-6,	50 H-P.,	6-cyl.,	weight, 235 lbs.
Model B-G-6,	70 H-P.,	6-cyl.,	weight, 255 lbs.
Model B-12,	120 H-P.,	12-cyl., V.,	weight, 400 lbs.

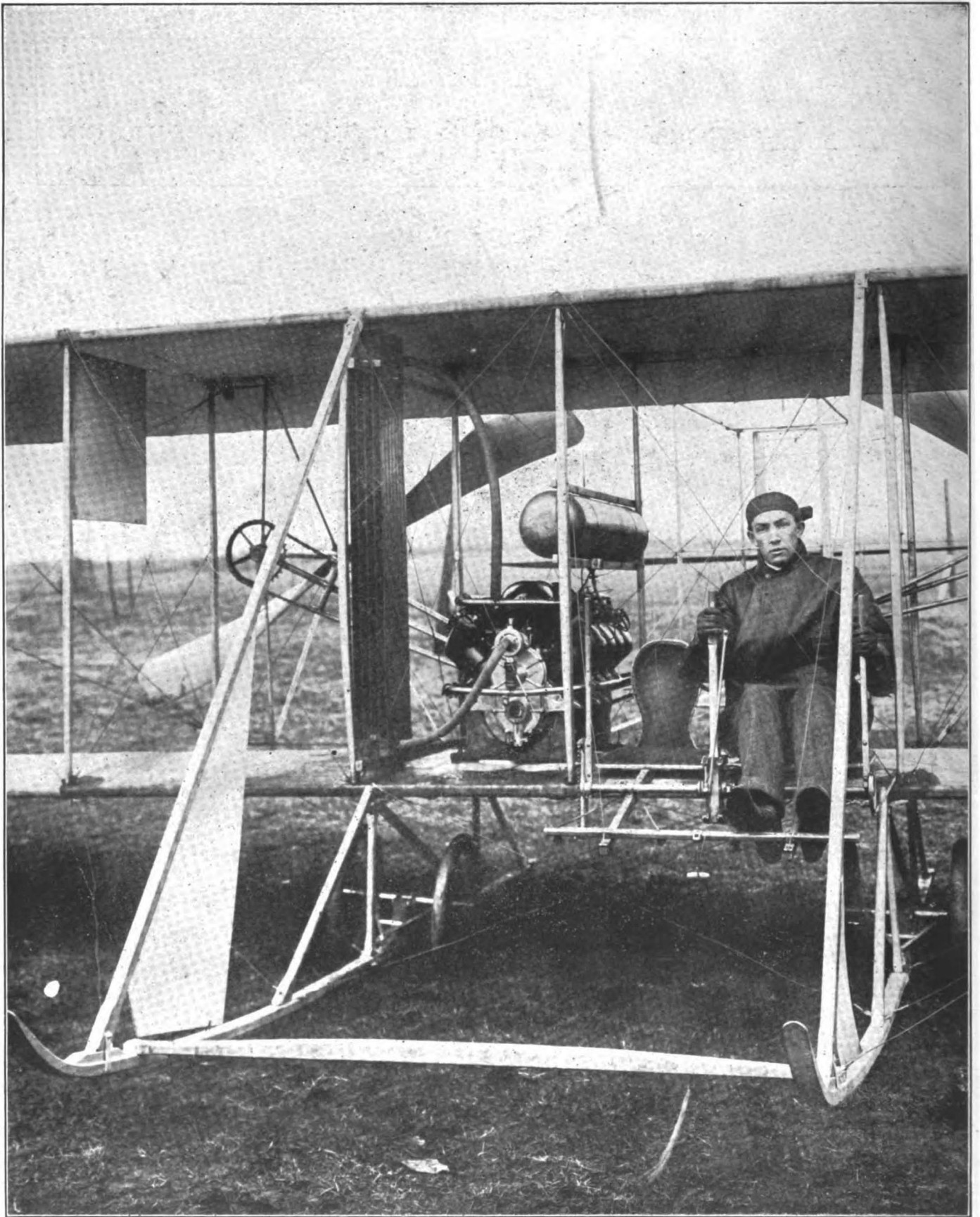
All of these models are sold as complete power plants or motor only, as desired.

THE universal success of every 6-cylinder, 50-H.P., "KIRKHAM" motor for season of 1911 has demonstrated their unquestionable reliability and efficiency; therefore the new models listed above contain not only all the features which have made the "KIRKHAM" Aviation motor noted for its reliability but in addition, all models for 1912 are to be equipped with the new Bosch 2-spark magneto, larger valves and special cooling tubes through oil tank, whereby the oil is always at a safe temperature no matter how hard or how long the motor is run.

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