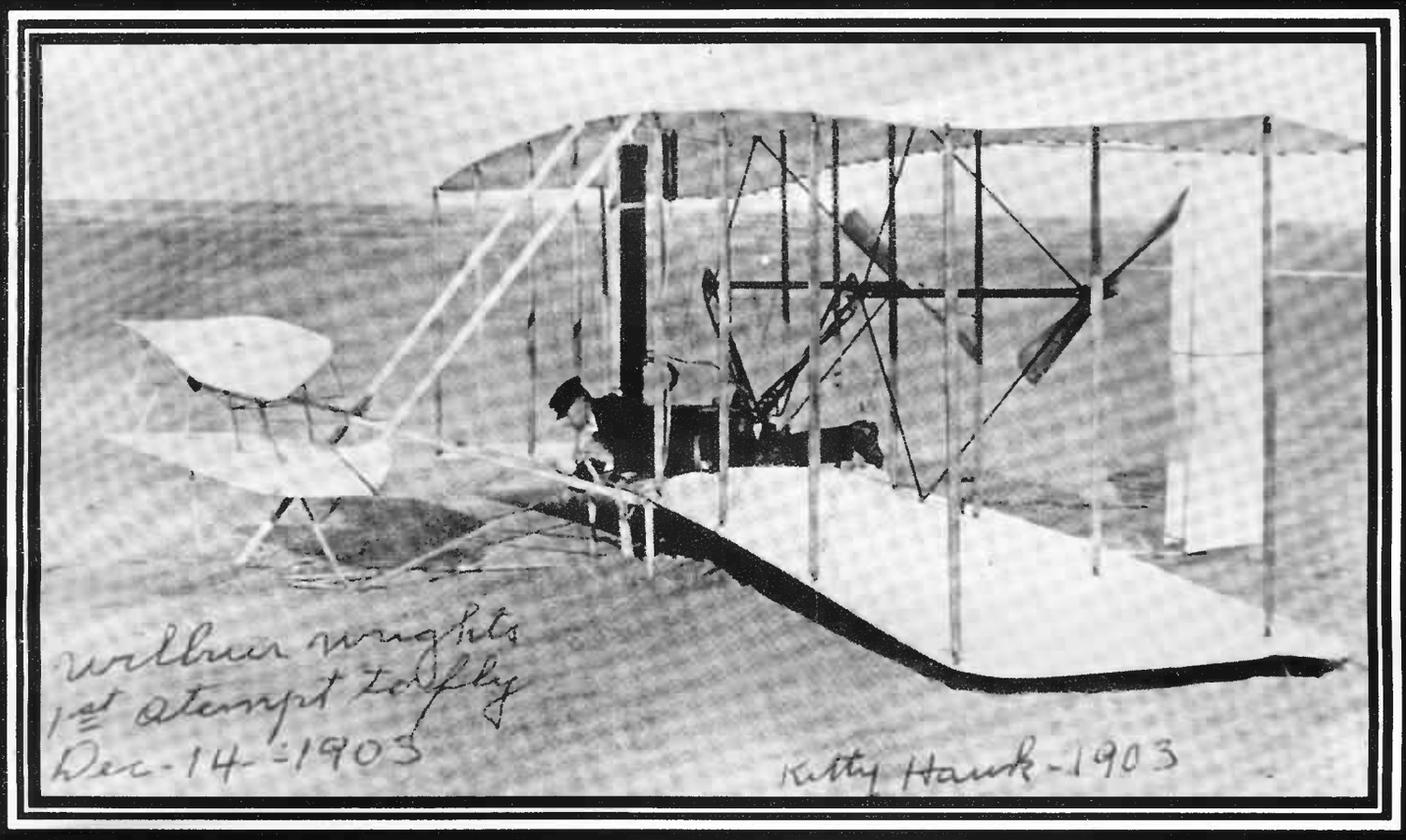
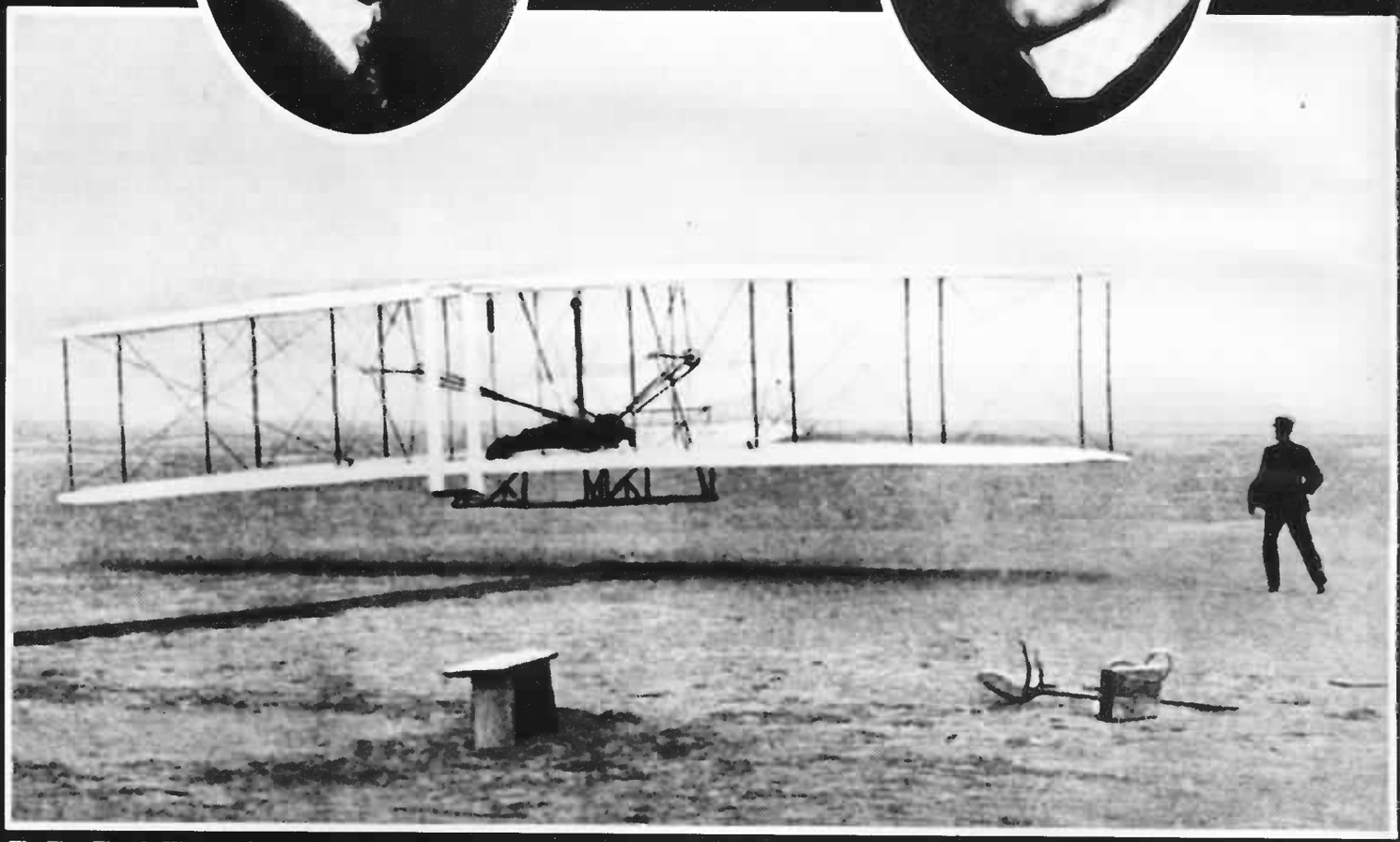


OX5
AVIATION PIONEERS

ORVILLE WRIGHT 1871-19

WILBUR WRIGHT 1867-1912



The First Time in History that an Airplane flew — Orville Wright's 12-Second Flight at Kitty Hawk, N.C., December 17, 1903. The distance was about 100 feet. On the same day Wilbur Wright piloted the Virgin Aircraft 852 Feet in 59 Seconds.

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Oliver V. Phillips, Secretary
Flora Balmer, Office Manager

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LEST WE FORGET . . .

The pioneering efforts of the airman of yester-year —

The hardships, heartbreaks and humorous incidents in the days of planes made of wood and hay wire, flown by men of iron —

The OX5 engine furnished the power for the fledglings of the embryonic air age.

So — the OX5 Club is dedicated to commemorate and perpetuate the spirit of those pioneers.

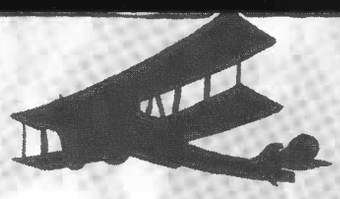
To foster and promote continued progress in the advancement of aviation.

To keep a current roster of its members for easy communication one with another.

And — to rally 'round for an annual reunion and rededication of that pioneering spirit.

Let us fan the flames of that spirit so that its intense heat will fuse the individual effort into a force that will bring peace on earth and good will toward men.

by: Clifford Ball
First Secretary



I AM THE AIRPLANE

by
A. J. CHALMERS

I am the airplane.

I am an ancient prophecy fulfilled, an early dream come true, a great ambition realized. I am the embodiment of man's perseverance, of his genius, of his ability to conquer and to carry on.

I am the new traveler. I cross mountain desert, lake and river; yet I need no road, I leave no trail.

I am the key to the vast uncharted skies. I am the new way.

I bridge the clouds in the heavens and the nations below. I give a perspective greater than the highest mountain peak. I reveal a world and beauties never dreamed before. I offer a new thrill. I open the blue vaults of the sky.

I make for the futility of war. I point to greater commerce. I transport to the uttermost parts of the earth. I travel straighter, I travel faster, than any other carrier. I am man's swiftest steed. I am the essence of speed.

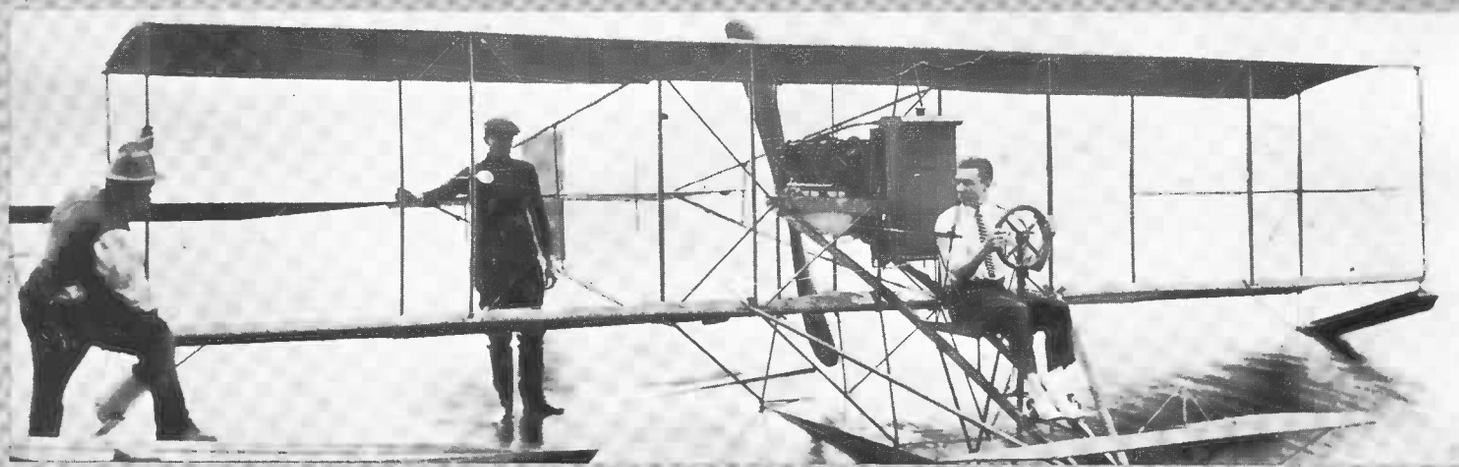
I am the airplane.

K.S.

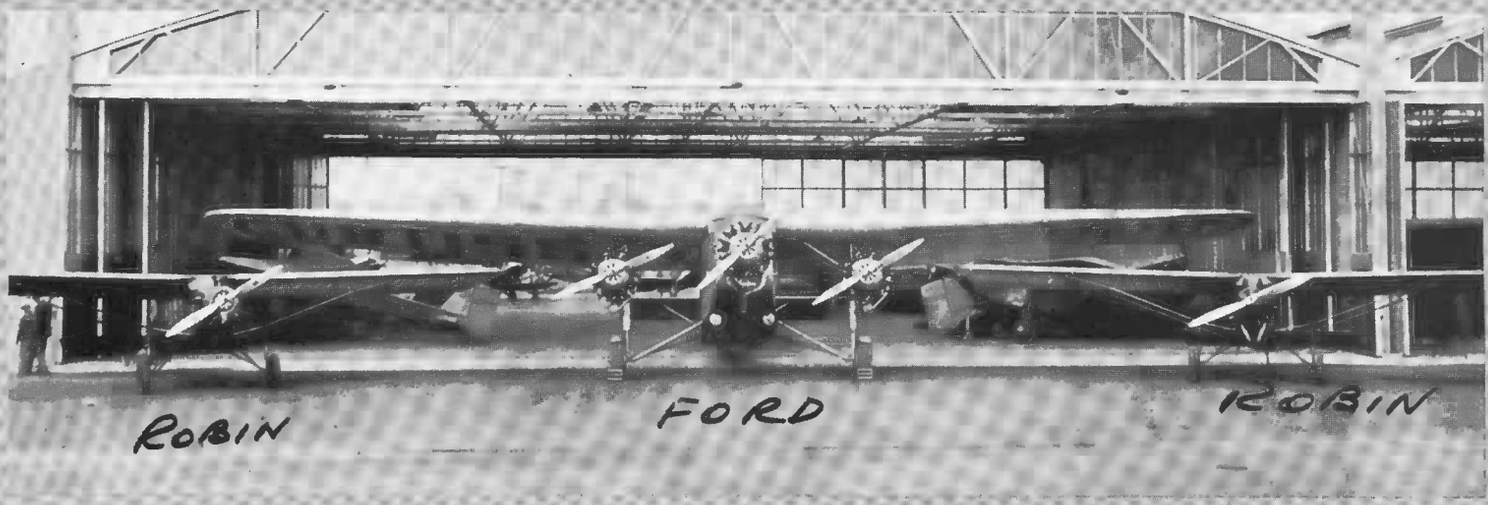
Crowds watching airmeet at Squantum Field near Boston, MA, on Sept. 3, 1910. Note the old fashion costumes and cars.

The "Express" built and flown by Charles Willard over the city of Los Angeles on Dec. 9, 1910.

J. W. "Daddy" Montee learned to fly at Clover Field and was still flying at the age of 90. His son, Ken, oper



Beckwith Havens in Rockford, IL in 1912.



CURTISS FLYING SERVICE — PHILADELPHIA CAMDEN AIRPORT — 1929

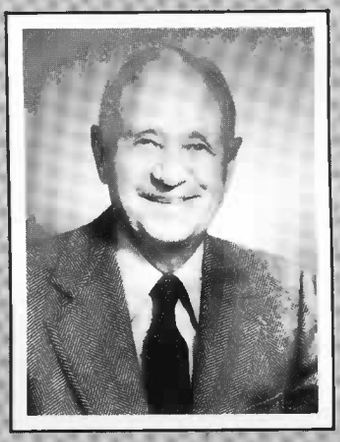
lying service at Clover for many years.

In 1929 Lindbergh is standing beside Travel 6000. This is the plane he took to Mexico to visit Anne Morrow.

CURTISS PUSHER — 1913 CURTISS P-1 "Hawk" — 1926

GLENN E. MESSER, Birmingham, AL, Early Bird and OX5 Aviation. Began flying in 1911 at Streator, IL, devoted his entire lifetime to all phases of aviation.

FOREWORD



Elrey B. Jeppesen

There's a big difference between a pilot and an aviator. One is a technician; the other is an artist in love with flight. This book is about aviators . . . and those who kept them flying . . . who at one time or another had a love affair with the OX5.

If there is one common thread among us, it's the overwhelming intensity with which each fought to become a part of aviation and the fraternity it spawned. For me it was worshiping heroes like Tex Rankin, Russ Cunningham and Walter Bookwalter; working at odd jobs on the airport; having Basil Russell teach me to fly an OX5 Jenny at Person Field in Vancouver, Washington; having my original pilot's license signed by Orville Wright.

Tex Rankin lived on my paper route. I always delivered his paper last, hoping he'd be home so maybe he'd talk to me. I'd usually take it around to the back door and give it to Mrs. Rankin, but I didn't fool her. She knew why I was there! It paid off, though. After I turned 18, Tex put me to work in his flying circus, and I was off and running.

Each of us could tell a similar story beginning, but a widely divergent story of now . . . which is exactly why this book came alive. It's a show-and-tell "then and now" book about a lot of OX5ers and the progress that comes when you add nuts and bolts to dreams.

Some stayed airborne to vitalize and expand the dimension of flight along its path to destiny. Others — earthbound — worked miracles with their nuts and bolts, turning a club-swinging Neanderthal into the energy-birthing furnace that powers today's big birds, creating electronic marvels that are making the destiny of flight achievable.

Deep in the back of each mind, however, is the nagging thought that we exist within a shrinking perimeter of time. What happens when the last OX5er flies away forever, and what we are, and have been, goes with him?

Well, it isn't going to happen that way, because the basic idea behind OX5 came from the same power that has carried this nation forward from its beginning, and continues to energize tomorrow's dreams.

Even though this is a "then and now" book, it is really only a pause taken from the course of on-going history. OX5ers helped establish and build much of the groundwork and structure of today's aviation industry. The force that nurtured us and what we became will certainly bridge over to coming generations to be used on their own leading edge of progress.

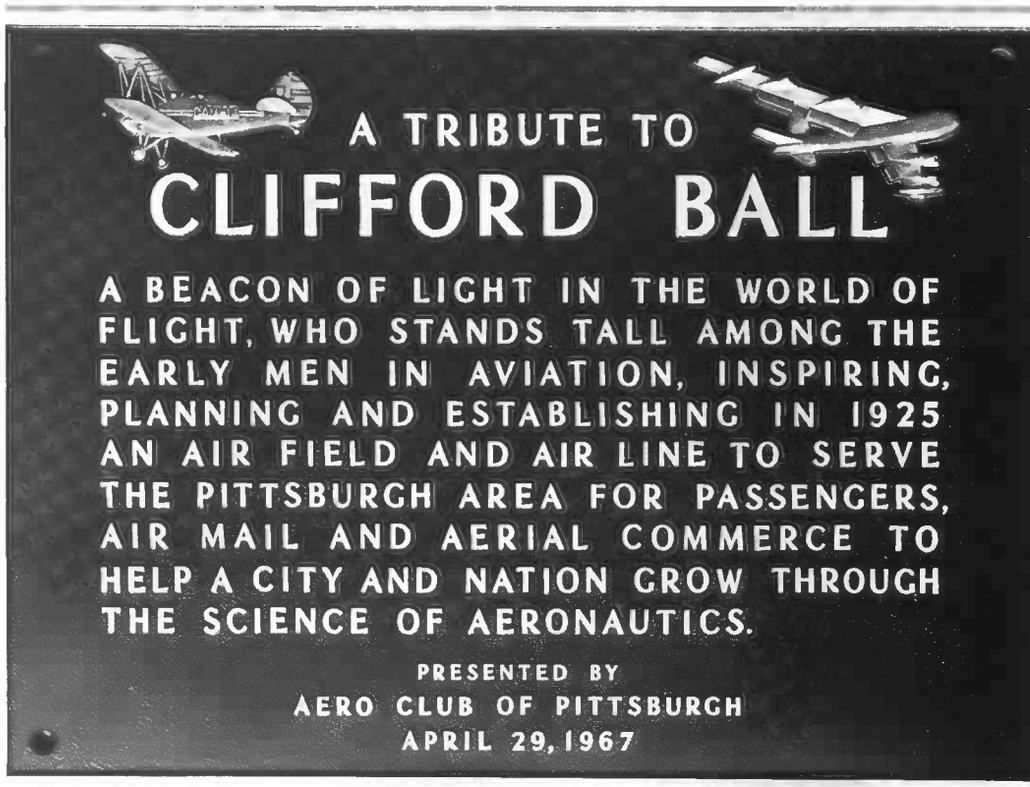
That's because there will always be a few artists willing to fall in love with flight. And that's why you can bet your bottom dollar that there'll be a philosophical piece of the OX5 tucked in somebody's hip pocket when that far-ahead future crew first nudges out of orbit and turns to the stars.

E.B. Jeppesen

First aerial mail flight to Memphis on Dec. 7, 1918.

First Stearman built in 1927 in Venice, CA. Tested at Clover Field in Santa Monica, CA.

Clifford Ball



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The following paragraph was the opening and closing remarks of Clifford Ball, Master of Ceremonies at Old Timers' Day 1955, at the Aero Club of Pittsburgh, where the idea for the OX5 Club was proposed.

"Man's greatest gift from the Gods is Memory — which permits him to warm himself at the fires of yesteryear; his second greatest gift is Forgetfulness, which permits him to shake off the bitterness of past defeats and injustices. Everybody shares in the first gift, but only the nobler spirits are able to take precious advantage of the latter."

The OX5 Club is founded on Memory — in order to carry the card of membership, your pioneering effort must have occurred from 1917 to 1940.

"CONTACT" was the magic word — the signal that we were ready to warm up the engine.

"PULL THE CHOCKS" came next. We were ready for the take-off.

"LET'S GO" — Each and every member is on the membership committee. We are off to a flying start. Pass the word around. Let's come back into the airdrome with a full cargo of applications.

Voelter

Top Photo: Taken at Topeka, Kansas Airport 1928. Long Wing Eaglerock OX5 powered and a group of students I was teaching to fly at Roy Morris School of Aviation at Topeka, KS 1928 — D. W. (Don) Ballew.

AWARD

GLENN HAMMOND CURTISS

1878-1930

BEGINNING IN 1901, CURTISS BUILT LIGHTWEIGHT ENGINES USED IN HISTORY-MAKING DIRIGIBLE FLIGHTS. HE JOINED THE AERIAL EXPERIMENT ASSOCIATION IN 1907, WHICH BUILT SEVERAL SUCCESSFUL AIRPLANES. BY HIS PIONEERING FLIGHTS, HE WON THE SCIENTIFIC AMERICAN TROPHY IN 1908 IN THE "JUNE BUG", IN 1909 IN HIS "GOLD BUG", AND PERMANENTLY IN 1910 IN HIS "ALBANY FLYER". HE ALSO WON THE FIRST GORDON BENNETT TROPHY AT RHEIMS, FRANCE, IN 1909 IN HIS "GOLDEN FLYER".

A CURTISS AIRPLANE MADE THE FIRST TAKE-OFF FROM A NAVAL SHIP IN 1910, FOLLOWED IN 1911 BY THE FIRST LANDING AND TAKE-OFF. CURTISS DEVELOPED A SUCCESSFUL SEAPLANE, THE FIRST AMPHIBIAN, THE NAVY'S FIRST AIRPLANE, AND PARTICIPATED IN THE FIRST LAUNCHED SEAPLANE TAKE-OFF IN 1911. IN 1912 HE DEVELOPED THE FIRST FLYING BOAT AND BUILT HIS FIRST ARMY SIGNAL CORPS AIRPLANE. IN 1913 HE EXPERIMENTED WITH AN AUTOMATIC PILOT AND BUILT THE "AMERICA", THE FIRST TWO-MOTOR FLYING BOAT. IN 1916 HE DEVELOPED AND IN 1917 AND 1918 MASS PRODUCED THE FAMOUS "JENNY" USED DURING WORLD WAR I. HE DEVELOPED THE NC-4 FLYING BOAT USED TO MAKE THE FIRST TRANSATLANTIC FLIGHT IN 1919. IN THE 1920's THE CURTISS ORGANIZATION DEVELOPED MANY IMPROVED AIRPLANES.

TO GLENN HAMMOND CURTISS, FOR OUTSTANDING CONTRIBUTIONS TO AVIATION BY DEVELOPING LIGHTWEIGHT ENGINES, BY IMPROVING AIRPLANES AND CONTROL SYSTEMS, AND BY CREATING BASIC NEW FORMS OF AIRPLANES, THIS AWARD IS MOST SOLEMNLY AND RESPECTFULLY DEDICATED.

AWARDED DECEMBER 17, 1964, AT DAYTON, OHIO
THE AVIATION HALL OF FAME

GLENN HAMMOND CURTISS

GLENN HAMMOND CURTISS was born in the quiet upstate New York village of Hammondsport May 21, 1878. The son of Frank and Lua Curtiss was poetically named after the picturesque glen to the north of the village and after the village itself. Curiosity dominated his boyhood years as he tinkered with and repaired anything mechanical within his reach. Bicycles and speed were his pets and his teen years saw him the champion racer for miles around. While still in his teens Glenn set up his own bicycle shop in the village. As business progressed a branch shop was opened in Bath and still another in Corning. Orders for Curtiss-built bicycles flowed in so rapidly that another manufacturer was assigned to produce bicycles for him under his trade name "Hercules." This name was later to be used for some of his engines.

In 1901, with five thousand dollars borrowed money, young Curtiss started manufacturing his own motorcycles. He was soon to become renowned throughout the trade for his mechanical innovations and racing daring.

Curtiss' genius with engines reached the ears of a "Captain" Thomas Scott Baldwin, a famous balloonist of that time, and he was asked to design an engine to power a balloon.

Baldwin's dirigible, the "California Arrow," powered by a two-cylinder Curtiss air-cooled engine, won the honors at an Oakland, California, air meet in August 1904. Powered balloons became popular, and Hammondsport became the site of many balloon test flights due to Curtiss' ability to power them. The business grew from three men in 1901 to ten men in 1905 until finally in 1908 one hundred men were busy in the Curtiss plant learning the mechanics of powering lighter-than-air craft.

Still in his twenties, Curtiss had his chain of bicycle shops, bicycle manufacturing contracts, his motorcycle contracts plus an increasing amount of dirigible motor orders.

January 23, 1907, found Curtiss competing in a motorcycle race at Ormond Beach, Florida. His strange V-8 powered machine was officially clocked at 136.3 mph and on that day he became the "fastest man on Earth."

At this time there existed a small group of people interested in manned, heavier-than-air flight. The nucleus of this group were Dr. and Mrs. Alexander Graham Bell. On September 30, 1907, the Aerial Experiment Association was formed comprised of Dr. Bell, Curtiss, F.W. Baldwin, J.A.D. McCurdy and Lieut. Thomas Selfridge, who was "on loan" from the Army. The latter three had been studying with Bell into the practicality of a manned, self-powered flying machine, and all decided that an engine expert such as Curtiss would be a must if they were ever to progress with their plans. Curtiss was uninterested at first but soon acquired some of their enthusiasm and the Association was formed.

The Wright brothers had already made their successful flight nearly four years earlier, but condemnation from the press and subsequent public distrust toward flying and anyone connected with it resulted in little publicity and interest in such projects.

The group proceeded to set up headquarters in Hammondsport, New York, where the fair climate and accessibility of the flourishing Curtiss manufacturing plant made experiments in flight more feasible. On March 12, 1908, the first public flight (the Wright brothers' flight was secret, not made public) in America of a heavier-than-air machine was accomplished from the ice of Lake Keuka with "Casey" Baldwin at the controls. The machine was the "Red Wing." She took off from a flat surface under her own power and stayed in the air for twenty seconds covering a distance of 318'11".

May 22, 1908, saw the Association's second aircraft, the "White Wing" with G.H. Curtiss at the controls, fly a distance of 1017 feet. The "White Wing," unlike its predecessor which rode on steel skids for take-offs and landings on ice, was outfitted with rubber balloon tires, since the ice had long since melted from the lake.

Data collected from the flights of the Red Wing and White Wing led to the development of the Association's third aircraft, the "June Bug." Under Curtiss' guidance and mechanical genius, the June Bug was outfitted with newer innovations designed to give the craft a greater range and stability. The craft responded favorably to its tests and soon Pleasant Valley was humming with the news that the Association had elected to enter her in competition for the *Scientific American* trophy.

Winning the first leg of the trophy for the year 1908 involved flying a machine in a straight line for a distance of one kilometer (3,280 ft.). On July 4, 1908, Glenn Curtiss piloted his June Bug through Pleasant Valley for a total distance of 5,090 ft., 1810 ft. more than the required kilometer. This was the first officially observed and recognized flight in America, which made him not only the *Scientific America's* first winner but three years later, in 1911, was to earn him the first pilot's license issued in America.

A fourth aircraft, the "Silver Dart," was developed in the year 1908 by the Association, and on March 31, 1909, as was planned, the Association disbanded minus one of its original members, Lieut. Thomas Selfridge, aviation's first fatality, who was killed while a passenger of Orville Wright.

June 16, 1909, Curtiss piloted his "Gold Bug" a distance of 24 7/10 miles before judges and spectators establishing a new distance record. This feat won him the second leg of the *Scientific American* trophy.

One of the highlights of Curtiss' career occurred in Rheims, France, in August 1909 when, competing against Europe's top aviators, he won the Gordon Bennett Cup speed race. The only American entry in the air meet, Curtiss' "Golden Flyer" averaged 46 mph.

Early in 1910 the *New York World* newspaper offered a $10,000 prize for the first successful flight between Albany and New York following the Hudson River. This, they felt, would provide an interesting parallel to the feats of Hendrick Hudson and Robert Fulton, who had covered the famous route earlier on its waters.

It is interesting also to note that in only a few short years, rather than condemning and ignoring the efforts of aviation's pioneers, the American press was now encouraging and inspiring them to greater aeronautical achievements. Curtiss' victory in his "Albany Flyer" earned him not only his prize money and due recognition from the entire nation but also won for him the third leg and permanent possession of the famed Scientific American trophy.

THE FATHER OF NAVAL AVIATION

Curtiss' Hudson River flight provided considerable impetus to the practical use of the airplane as a fighting machine. So it was that in June 1910, through the suggestion of the *New York World,* the first demonstration of aerial bombing tactics was given by Curtiss to the Army and Navy at Lake Keuka. The following January 18, 1911, Curtiss further convinced the military of the value of an airplane in warfare when one of his pilots, Eugene Ely, successfully landed and took off again from the deck of the battleship Pennsylvania. The Navy, however, had insisted that to be practical a plane should be able to land and take off from the water itself rather than from a wooden deck which would impair the fighting value of a warship. The following month Curtiss landed the hydro-aeroplane, which he had been busy perfecting, alongside the U.S.S. Pennsylvania; it was hoisted aboard, lowered into the water again; and Curtiss took off back to land. Naval aviation was born.

In September 1911, Curtiss and Navy Lieut. Ellyson successfully perfected a catapult of their design along the shore of Lake Keuka. It was further perfected by the Navy and later became an integral part of some of America's fighting ships. From Curtiss' early naval experiments evolved the floating atomic-powered airfields of today; the backbone of the world's most powerful fleet.

After innumerable experiments, the summer of 1912 saw Curtiss pilot the world's first successful flying boat. This machine, instead of a standard land plane equipped with pontoons such as his hydro-aeroplane, was basically a boat hull fitted with wings and an engine.

Many of the nation's leading millionaire-sportsmen and businessmen rapidly saw the sporting and practical advantages of this amazing craft and kept the Curtiss plant in Hammondsport busy with orders throughout the year 1913.

WAR

Soon after war broke out in Europe in 1914, the Curtiss plant was deluged with orders from Great Britain for Curtiss' latest model, the famed "Jenny." New Curtiss plants opened in Buffalo to handle the demand. When the United States entered the war in 1917, even greater demands were placed upon the Curtiss Airplane & Motor Company, until a total of ten plants employing 10,000 people were running full capacity. Before the war's end, Curtiss, along with the U.S. government, agreed that attempts should be made to fly Curtiss flying boats across the Atlantic rather than transport them on sh which were often the victims of the German U-boats.

The Armistice was signed while the Curtiss flying boat was bei tested along our Atlantic coast. However, in May 1919 a Curtiss N 4 commanded by Lt. Cmdr. Albert C. Read took off from Ne foundland, landed at Horta, then proceeded to England, thereby co pleting the first aerial trans-Atlantic crossing.

The war ended, G.H. turned toward other activities. In partnersh with a former Western cattleman, they developed the cities of Hiale and Miami Springs, Florida. He also pioneered the "home away fr home," more simply known today as the house trailer.

Throughout the twenties when Curtiss wasn't traveling, he indulg himself with his favorite hobby, speed.

In May 1930 he piloted a Curtiss transport plane loaded w dignitaries, retracing his route of twenty years earlier from Albany New York City.

Two months later, G.H. submitted to surgery for appendicitis i Buffalo hospital. On the twenty-third day of July at the age of fif two a small blood clot ended the life of Glenn Hammond Curtiss.

His life is stilled and his remains rest in peace, but his complishments are daily being magnified in the skies above us.

Today, when you turn your eyes toward the heavens and ponder probing of man into the universe, spare a moment to reflect upon memory of a quiet, determined man from Hammondsport who is i large part responsible for many of the present and future aviat miracles.

And sometimes, even today, as you pass between the quiet hills Pleasant Valley, you can almost hear the whir of a tiny engine an host of muffled voices raised in a distant cheer. "G.H." is once ag raising his hopes and ambitions toward the beckoning sky.

A Partial List of Curtiss Accomplishments

1904 — The airship "California Arrow" powered by a Curtiss Motor and piloted by Capt. T.S. Baldwin makes first successful flight on a predetermined course.

1905 — "The Fastest Mile." On his own eight-cylinder motorcycle, Curtiss travels one mile at an average speed of 136.47 m.p.h.

1907 — Aerial Experiment Association is formed by Dr. Alexander Graham Bell. Curtiss named director of experiments.

1908 — "Red Wing" built by A.E.A. makes first public flight in America 318 ft. 11 in. from ice on Lake Keuka, Hammondsport. Curtiss makes his first winged flight in "White Wing," 1,017 ft. Curtiss in "June Bug" wins first leg of Scientific American Trophy for first public flight in America of one kilometer. Curtiss motorcycles win all events in F.A.M. National Endurance Contests. Curtiss and Baldwin demonstrate the new dirigible, SC-1, at Fort Meyer, Virginia, remaining in the air for two hours and meeting all Army requirements. The SC-1 becomes the first aircraft purchased by the U.S. government. First experiments with aeroplanes on floats on Lake Keuka.

1909 — Curtiss wins second leg of Scientific American Trophy in "Gold Bug" by flying 24.7 miles on circular course at Mineola, Long Island. Curtiss wins the Gordon Bennett Cup at Rheims, France, for America against all of Europe's top aviators and machines.

1910 — Curtiss lands aeroplanes on water for first time in history. Curtiss flies 150 miles across country from Albany to New York, winning the New York World's $10,000 priz the third and final leg of the Scie American Trophy. Eugene Ely, in C plane, takes off from platform built on th of the U.S.S. Birmingham.

1911 — Ely makes successful landing take-off on U.S.S. Pennsylvania. Curtiss first successful flight from water. Curtis hydro-aeroplane to U.S.S. Pennsylvan hoisted aboard, then relaunched, and home. Navy orders its first plane. C demonstrates first amphibian. Curtiss re pilot's license No. 1, United States of Am Curtiss awarded Collier Trophy for greate complishments in aviation during year. C receives Gold Medal of Aero Club of Am for "greatest advance in aviation during t

1912 — Curtiss invents flying boat. C receives Aero Club Gold Medal for time.

1913 — Curtiss receives Langley Med developing flying boat. Curtiss secures tracts from abroad from various Eu governments.

1914 — The first of the famous "Jenn completed. World War I — All-out war transforms Curtiss plant into a giant a manufacturing complex.

1919 — Lt. Cdr. Read, U.S. Navy, make crossing of Atlantic in Curtiss NC-4 boat.

1930 — Curtiss makes last flight in t passenger Curtiss Condor over original Albany-New York route.

1. Curtiss Museum.
2. Taylor Winery.
3. Great Western Winery.
4. Valley flatlands, site of Curtiss flights.
5. Rev. Bostwick founds N.Y. State wine industry, 1829.
7. World famous view of Lake Keuka overlooking vineyards.
8. Taylor-Vangelder Airport (private) 2 UNICOM, 122.8.19 nautical miles on Radial from Watkins Glen OMNI.
9. B&H Airport (private) 1800 ft. UNI
10. Lake Keuka, site of first hydroplane f

Help Support the Glenn H. Curtiss Museum at Hammondsport

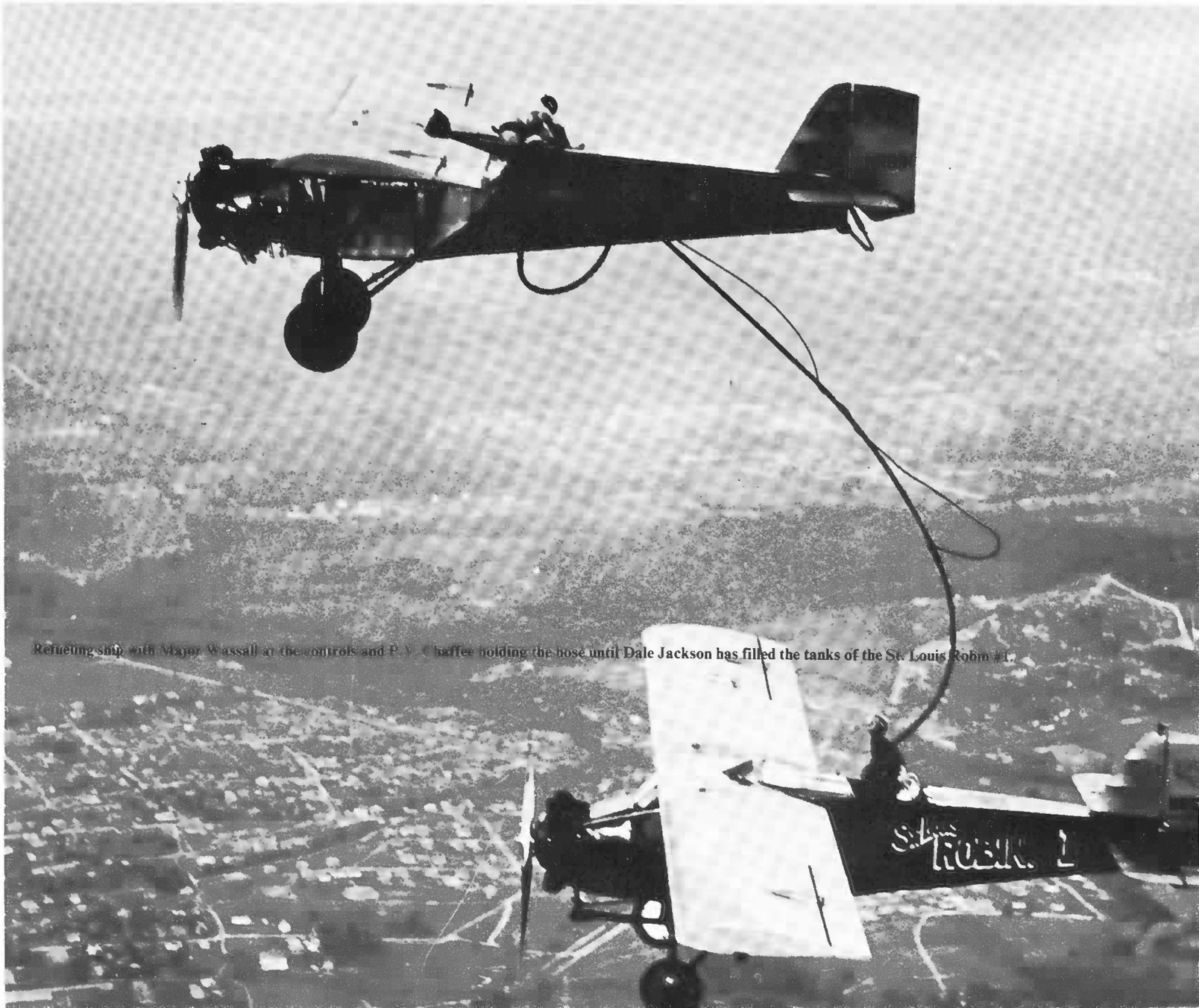

Curtiss
FLYING SERVICE
"WORLD'S OLDEST FLYING ORGANIZATION"
COMMERCIAL FLYING
PHOTOGRAPHY
Curtiss
CHALLENGER
ENGINE
GROUND
FLY


EASTERN
NX 8690
5
Curtiss

Curtiss Aeroplane Motor Co., Inc. — Commercial Airplanes — 1929
Condor — King Bird — Thrush — Robin — Carrier Pigeon II — Fledgling

This Great Lakes was modified into a single place — to make a baggage compartment in the front seat. You can see part of my ad on the panel. This was the plane mentioned in my 1931 news item. A. H. Anderson

Alfred K. Young posing in the cockpit of his OX5 Challenger N4911. The occasion being dedication of the then called Pittsburgh-Greensburgh Airport.



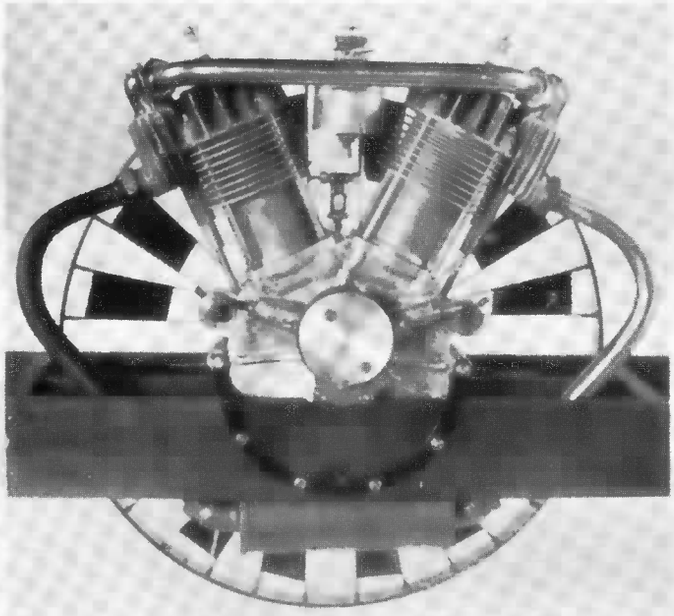
Refueling ship with Major Wassall at the controls and P. V. Chaffee holding the hose until Dale Jackson has filled the tanks of the St. Louis Robin #1.

OUR HERITAGE: The Curtiss OX5 Engine

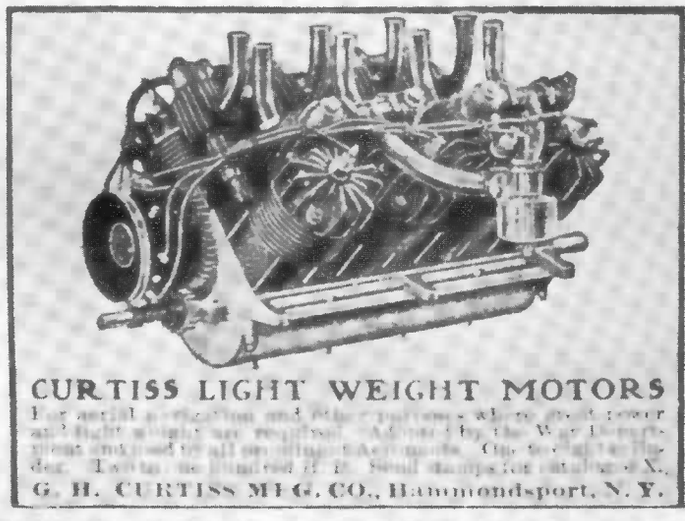
The most important period in the development of the aviation industry. A time when flying emerged from the sideshou type business and came of age commercially.

Only the OX5 Aviation Pioneers represent this era.

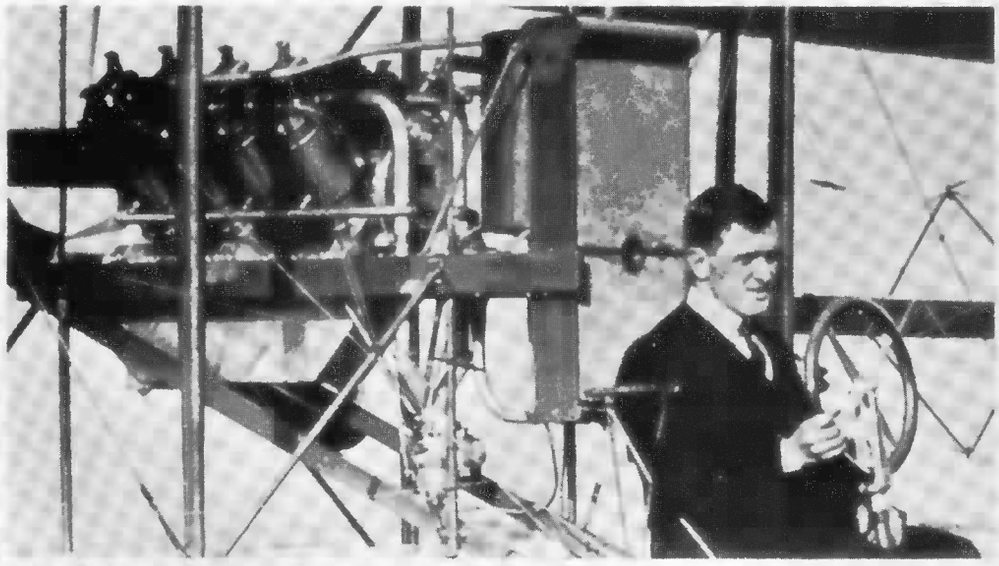
Member photographs and brochures assembled by Foster Lane



Curtiss motorcycle engine adapted for airship use after 1906-07. Possibly the first Curtiss engine used by Capt. Baldwin in his airship. Notice the fan was a bicycle type wheel with bicycle spokes. Photo from the collection of Geo. A. Page, Jr., Reynoldsburg, Ohio.



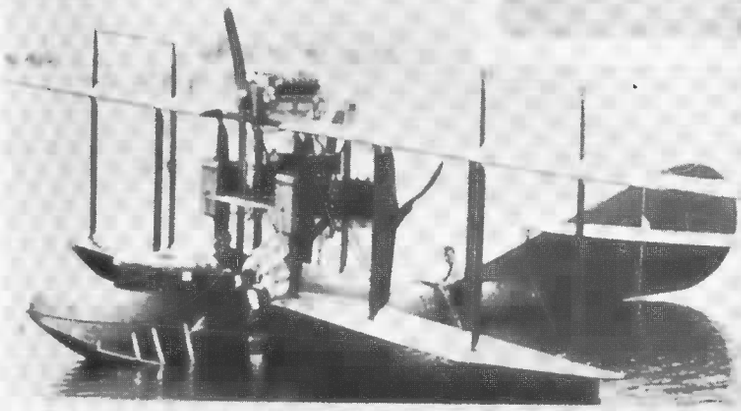
G.H. Curtiss engine advertisement about 1907. Tested in a motorcycle for airship use. This was a forerunner of the OX5 Model.



OX5 engine in a Curtiss Pusher about 1913. Pilot Lincoln Beachy. Good view of Curtiss controls. Shoulder yoke by his right shoulder controlled ailerons, the wheel right and left was rudder, and forward and backward was elevator.

Glenn Curtiss (age 31) at the first World A Rheims, France. He won for America the Gordon-Bennett International Speed Rac Aug. 29, 1909, $10,000. Twenty kilomet speed 47.4 mph.

RIGHT: Rare photo. Curtiss "F" Triplane Flying Boat with OX5 engine. About 1915.
(Photo from Geo. A. Page, Reynoldsburg, O.)

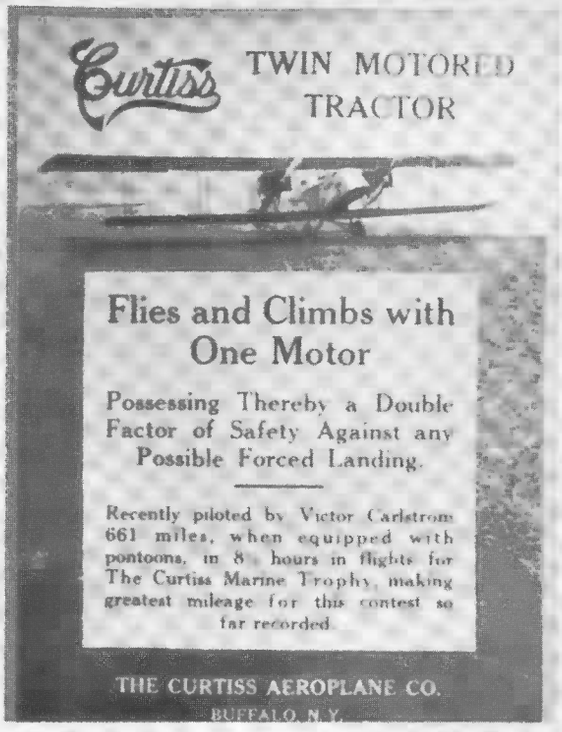


LEFT: As an experiment another OX5 engine was added to the America. Third engine is in tractor position. In August 1914 during the first World War the British Royal Naval Air Service purchased the America and used it on anti-submarine patrol.
(Photo from Geo. A. Page, Reynoldsburg, Ohio).

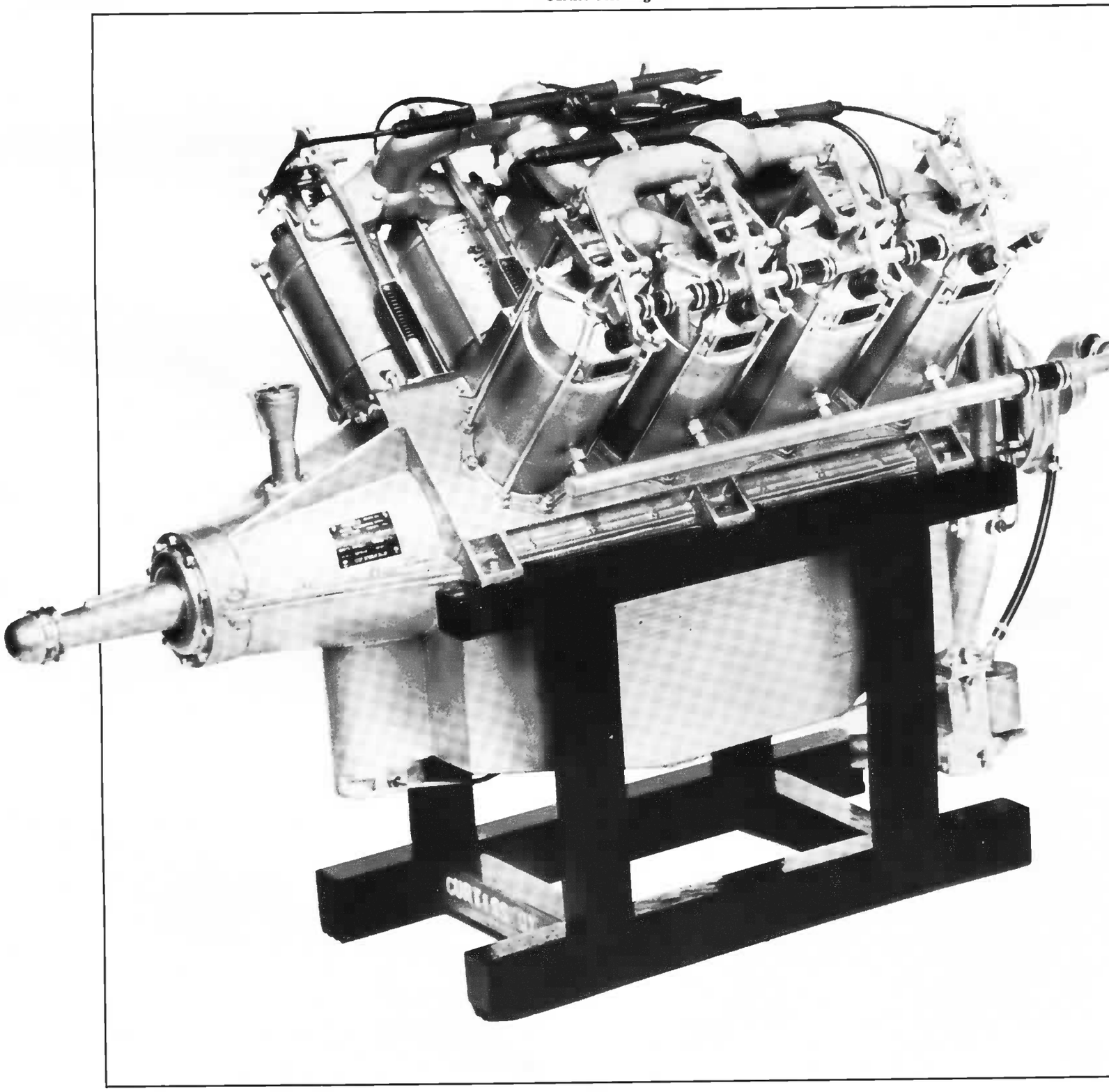
RIGHT: Curtiss two OX5-engined Aeroboat built for Rodman Wanamaker, head of the New York store. Designed to be the first airplane to fly the Atlantic. Christened "America" and test flown June 23, 1914. The problem was how to lift enough fuel off the water (300 gallons, 1900 lbs., plus two pilots) to fly the first 1100 mile leg to the Azores. Painted bright red. Upper wing 72 ft. Hull white cedar.
(Photo from the collection of George Page, Reynoldsburg, Ohio, OX5 and Early Bird Member.)

Jenny on skis. Don't know the pilot. Must have been Red Crown gasoline in Milwaukee. That left wing skid looks a little out of shape!
(Photo owned by George Page).

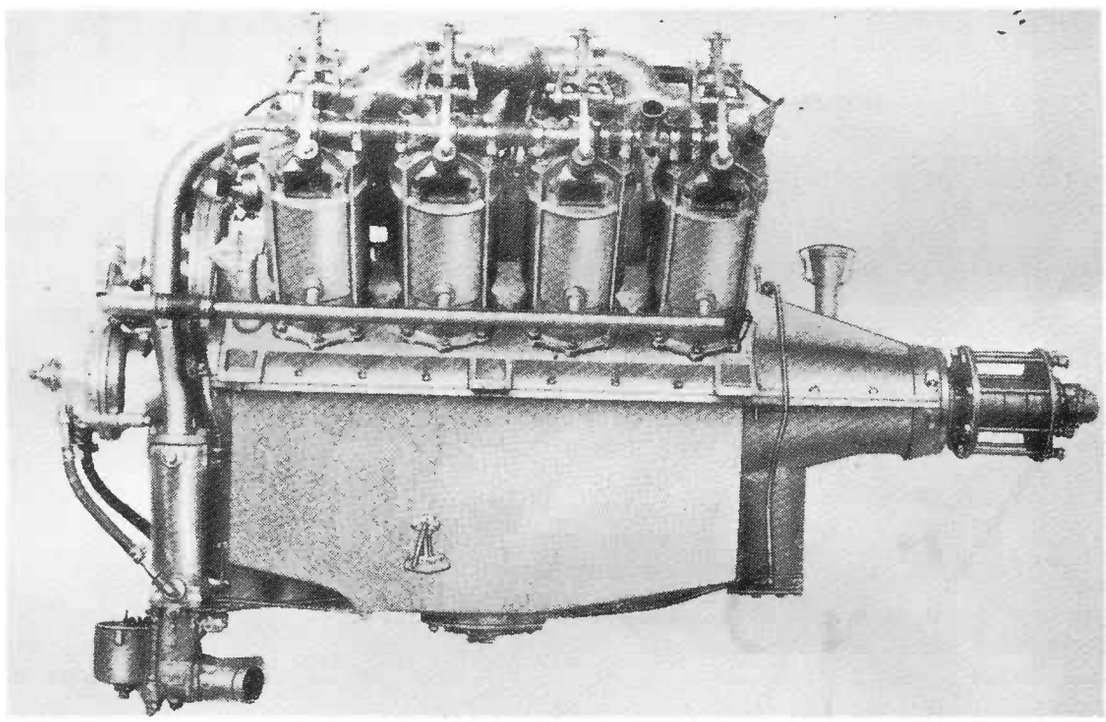
RIGHT: Twin-engine Jenny shown in Dec. 1916 magazine advertisement.



Curtiss OX5 Engine



HISTORY OF THE OX5 ENGINE



THE OX-5 ENGINE

THE CURTISS OX ENGINES

It sometimes happens that a single member of a family becomes so well known that the fine performances of other members become largely overlooked. Such is the case with the family of early Curtiss aviation engines, the best of the North American engines in the pioneer period. In this case, the wide spread use of OX-5 engines in World War I training and in civil use during the post war period has put all its predecessors in the shade.

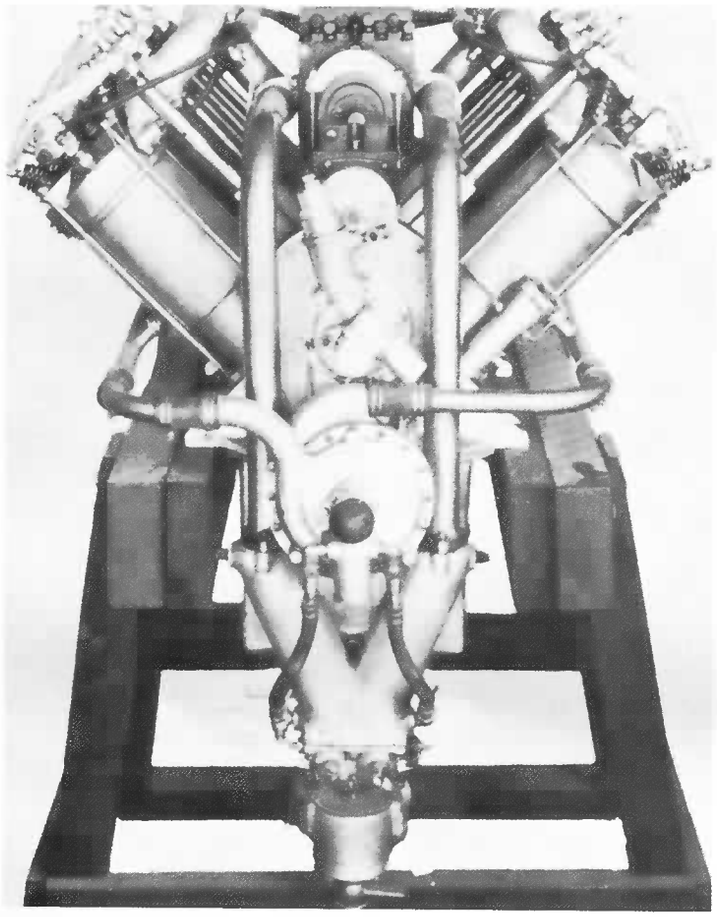
The first Curtiss engines were small air cooled motorcycle engines with which Glenn Curtiss had considerable success in racing and with which he finally won the world's land speed record in 1907. This success, and the quest for light power plants by aeronauts, led to the adoption of the motorcycle engines to early dirigibles.

Dr. Alexander Graham Bell, in seeking a power plant for the tetrhedral kites with which he was experimenting, made his first contact with Curtiss and was supplied with two air cooled engines in 1907. Later in the year, Dr. Bell, aided by the charming Mrs. Bell, persuaded Curtiss to join the Aerial Experiment Association as their engine expert.

The first Curtiss engine to power a heavier-than-air machine was a duplicate of one supplied earlier to Captain T. S. Baldwin for his airship. It was an air-cooled 8-cylinder Vee-type and developed 40 h.p. at 1,800 r.p.m. It was to power the first three aircraft of the A.E.A., however, it was not satisfactory since it overheated quickly and lost power so that flying had to be stopped until it cooled. The longest flight achieved with this engine was with the JUNE BUG on August 29, 1908, which lasted just three minutes and the well publicized Scientific American Trophy flight lasted just 102.5 seconds.

J. A. D. McCurdy of the A.E.A. upon seeing the new water-cooled engine to power a heavier-than-air machine, and the engine - which was built for Capt. Baldwin in 1908 suggested that the A.E.A. adopt the water cooling principle for its fourth machine.

Curtiss then turned out a 3.75 x 4.0 (bore x strike) 90 degree Vee engine which was water cooled to power the SILVER DART, the most successful of the A.E.A. machines. Many flights of up to 20 minutes duration were made - a vast improvement over the earlier JUNE BUG and its engine. It, thus, became the first Curtiss



This photo of rear of OX-5 engine gives best view of arrangement of magneto, water pump and carburetor. (USAF Museum Collection)

water-cooled engine to power a heavier-than-air machine, and the forerunner of a long family series of water-cooled engines which concluding in the OX and OXX series. The later Curtiss engines which followed were of a different family.

Upon dissolution of the A.E.A. in 1909, after achieving the objective of building a practical flying machine, Curtiss entered into a short lived association with Augustus M. Herring. His aircraft were simplified versions of the A.E.A. machines and his engines were developments of the SIVER DART engine.

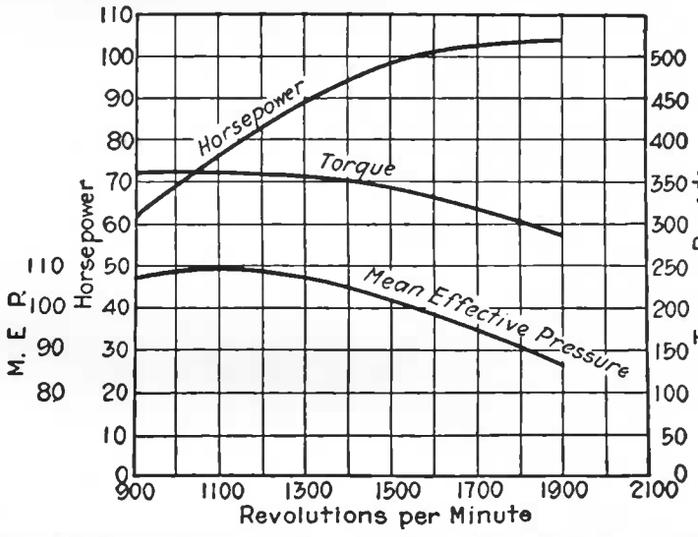
The valve gear was changed on the subsequent engines. The Silver Dart engine had concentric valves; the exhaust valve was operated by a push rod but the intake valve was at first naturally aspirated (but sometime later was push-rod operated). The new valve gear for the engines that followed comprised a single push-pull rod and a single rocker arm to operate both valves, a feature that remained unchanged in principle until the introduction of the Model OX.

The Curtiss engines developed, as did most families of engines, with gradual refinements of details and increases in size until the Model O appeared in the Spring of 1912.[13] In most cases once a new cylinder had been designed, two different engines were marketed - one an 8-cylinder, 90 degree Vee engine and the other a 4 cylinder upright model. Curiously, little is known as to who was responsible for the design and manufacture of these engines. Charles Willard reports that there were no facilities for engine manufacture at Hammondsport in the early days. It is known that Charles Kirkham, in nearby Bath, N.Y., assisted and produced some parts. One is led to believe that Kirkham very probably played a major role in their design and manufacture. Alexander Pfitzner, an Austrian engineer, worked for Curtiss briefly and is understood to have worked on the engines but his contribution is not known. In view of the fact that it was through his engines that Curtiss first entered aviation, and that their continuing good performance was a major - if not the major - factor in the early success of the Curtiss Co. it is surprising that the biographies of Curtiss give so little attention to engine development.

The Model O that came in 1912 was shown in New York at th Grand Central Palace. It was a logical development of the Ve series of engines with a 4 inch bore and 5 inch stroke an developed 75 h.p. at 1,100 r.p.m. It differed from the earlie engines in having a monel water jacket in place of copper bu retained the earlier valve gear. This valve gear, while being simple had the disadvantage of limiting the timing of the valve operatio and consequently preventing the best possible charge of (com bustible mixture) being obtained in the cylinder. It furthe prevented complete scavenging of the exhaust gases. Never theless, the model O was a good engine and was popular wit the early aviators.

The limitations of the valve gear were recognized and a new valv gear developed. It is not clear just who realized the problem an developed the new mechanism. Scharff and Taylor attribute th new design to John H. McNamara, engine superintendant at th Curtiss Company.[14] Struder, in her biography, credits Fran Keckler with its development.[15] Elsewhere one hears Henr Keckler's name mentioned in connection with it but it suspected that McNamara is probably the originator of the desig

The valve gear that was developed was unusual. It featured tw concentric rods operating two rocker arms and remained distinctive part of all the OX and OXX engines. The inner rod wa a push rod, and operated the exhaust valve while the outer ro was a pull rod (or tube) and operated the intake valve.



Performance Curves of Curtiss OX-5 Engine, 90 hp. (Source – Curti A&M)

The improved Model O featuring the new valve gear wa introduced in the Spring of 1913 and, according to Scharff an Taylor, was intended to be called the Model O+ but the "plus" sign became inadvertently turned 45 degrees and the engin became known as the OX. During early testing the OX develope up to 100 h.p. but it was marketed with a rating of 90 h.p. a 1,400 r.p.m. and this rating remained unchanged throughout it life.

The Model OX was developed through four versions - the OX-2 OX-3, OX-4, and OX-5. In all these versions the basic engin remained unchanged; only details were altered and it wa necessary to distinguish between them for the purpose o providing spare parts. Unfortunately, the details which wer changed as the engine developed are not known. Certai deductions can be made which lead to the following conclusion

1. All engines prior to the Fall of 1914 were of the basic Model OX.
2. In latter 1914 supplies of the German Schebler carburetor and Bosche magneto (standard on all early Curtiss engines) were cut off by the Allied blockade of Germany. The U.S. made Zenith duplex carburetor and Beurling magneto were substituted. This is believed to be the main difference between the OX and OX-2 Model introduced at this time.

3 The OX-3 and OX-4 Models are thought to be either experimental engines or produced in small quantities only.
4 The OX-5 engine had a propeller hub with a larger bolt-circle diameter, introduced to prevent loosening of the propeller in service, in the middle of 1917.

The OX engine was popular with the pioneer civilian flyers and the U.S. Army purchased 125 aircraft powered by it prior to 1917. The British bought OX-powered Curtiss JN-3's and JN-4A's and ordered further quantities for use in their own D.H.6. In Canada it was adopted by the RFC-RAF-Canada and was the only engine in use for the entire Canadian training program. In the United States, upon the outbreak of war only two American engines were considered suitable for adoption by the U.S. training program - the Curtiss OX and the Hall-Scott A7A. Troubles with the Hall-Scott led to its abandonment and the entire load of primary training in the United States then fell on the Curtiss OX engine.

In the postwar period, its availability in quantity at low war surplus prices led to its adoption by many U.S. manufacturers for their postwar 2 and 3-place aircraft. The Laird Swallow was probably the first of these designs, followed by a host of others such as the Travel Air 2000, Waco 9 & 10 and American Eagle.

Search of the aviation literature does not reveal any complaints about the OX engines during WWI in the United States and Canada and they seem to have performed well. In fact, Brig.-Gen. C. G. Hoare, in charge of the Canadian training programme wrote on July 17, 1917, to Brig.-Gen. L. E. O. Charleton of the Air Board Office in England as follows - " '- - engines are beyond all praise and most reliable of any type I have experienced." High praise indeed, especially when coming from an official source. In England, however, it is noted in the official history of the war in the air that the Curtiss OX "is not trustworth".[16] The reason for this is not known but it is known that the British fuel at that time was of a higher octane rating than that in use in North America and one wonders if this may have caused some difficulty.

Sir Roy Fedden, in his reminiscences, wrote of modifications to the induction system (to make them more suitable for British fuels?).[17] In addition, his account indicates that the British troubles may have been due to the receipt of early production engines following the hasty expansion of the Curtiss Motor Co. Consequently, the engines seemed to be suffering from the use of unskilled and untrained labor. Fedden wrote:

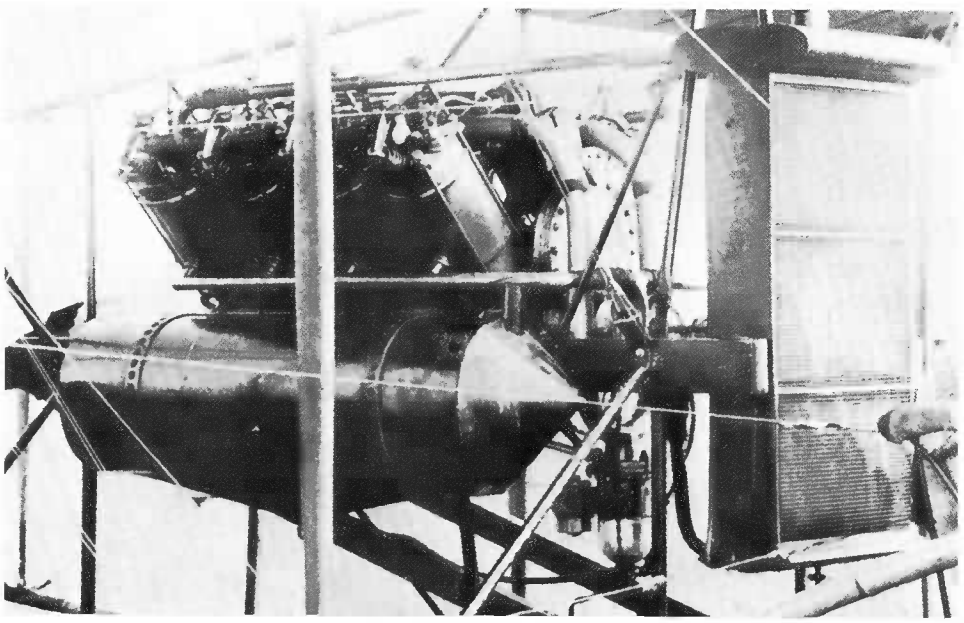
> "Briggs tried me out first by sending us between 300 and 400 American OX5-V8 Curtiss engines which had been shipped to the Admiralty from the USA, and we found that for the most part they were in a frightful state. A number were new in packing cases, some with broken drills still in the oil holes of the crankshafts and others with an unbelieveable amount of rubbish in the crankcases, among which some remarkable souvenirs were found, including a dollar bill. There were others that had flown, some having crashed and some having a variety of failures. This entailed embarking on quite an amount of design, including new oil pumps, induction systems and crankcases as well as carburettor and ignition modifications. Finally, we managed to produce 250 redesigned and modified engines, which gave excellent service and taught us a lot".

All OX engines were built by the Curtiss Motor Co. (after January 13, 1916, the Curtiss Aeroplane & Motor Co.) until after the entry of the United States into WWI when Willys-Morrow and Willys-Overland were brought into the production program to meet the demand. The exact total production of OX engines will probably not be known unless the production records of the manufacturing companies can be found. Gorrell cited the following figures.[18]

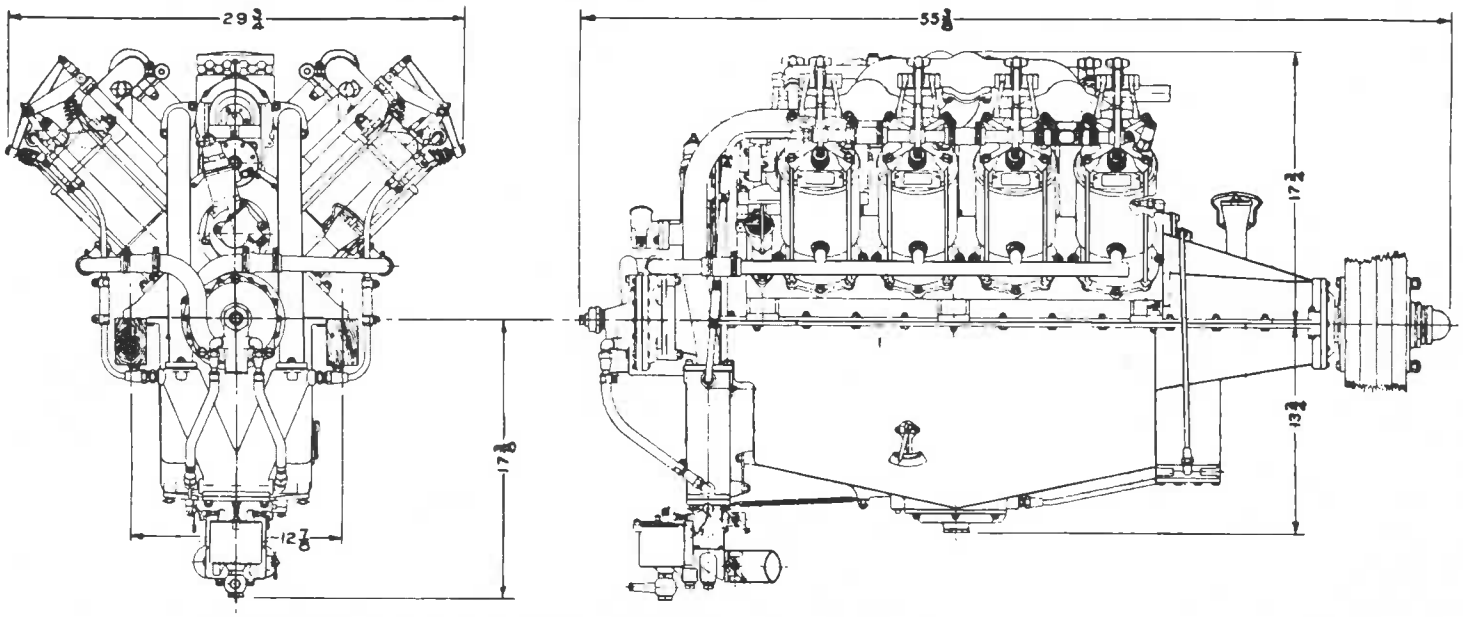
OX-5 engines produced in U.S. to November 11, 1918.

Curtiss A & M Co.	600
British	182
Willys-Morrow	6,136
Willys-Overland	1,000
Canadian	400
	8,318

Crowell gave a total of 8,458 OX-5 engines to November 29, 1918. However, it seems that this listing more correctly includes engines delivered to the U.S. government and not total engines produced by the U.S. industry.[19] There are several reasons for this belief. First, no OX engines were made in Canada or Britain and figures given must include those diverted to the U.S. (from Canadian or British allocations) - probably soon after the U.S. entered the war. If, on the other hand, Gorrell's figures do represent total production, then the inclusion of Canadian and British engines in the list is not understood. Again, if Gorrell's figures do represent total U.S. production, this indicates substantial quantities were diverted to Canada and Britain and the



A Curtiss Model O engine, immediate predecessor of the OX-5, installed in an early Curtiss Pusher. (K.M. Molson Collection)



General Arrangement Drawing – OX-5 Engine, 90 hp. (Source – Curtiss A&M)

remainder would have been a very skimpy supply for the U.S. training program. Finally, the total shown by Gorrell appears approximately correct to power the total U.S. Curtiss JN airplane production and to allow for slightly under 100% spares. This figure seems reasonable and may account for OX engines being available in new condition for years after the war.

Assuming this to be the case, the total OX engine production can be estimated as follows using known aircraft procurement figures plus allowances for spares.

Estimated total Curtiss OX engine Production, 1912-18

To U.S. civil orders 1912-16			150	
To U.S. military orders 1914-16			185	
To Curtiss Aviation School, Toronto 1915-16			24	
To Spain 1915			24	
To RFC/RAF-Canada 1917-18			2,400	x
To Britain for	RFC	1,600		
	RNAS	500	2,100	ø
To U.S. 1917-18	Curtiss	600		
	Willys-Morrow	6,136		
	Willys-Overland	1,000	7,136	
		Total	12,619	

x – 400 of this order diverted to U.S.
ø – 182 of this order diverted to U.S.

Soon after the introduction of the Model OX came a companion engine, the Model OXX with larger bore (4¼ inches); it developed 100 h.p. and had two magnetos. Viewed from above, the OXX engine was easily identified by its two magnetos but from other angles identification was nearly impossible unless one could recognize the larger cylinder diameter of the OXX.

In construction, the OX engines represented the best contemporary practice. Separate cylinders were made of cast iron with brazed monel water jacket. They were mounted in two banks of four set at 90 degrees and the cylinders were offset to permit side-by-side connecting rods on each of the four crank pins. Each cylinder was held in place by four short studs on the mounting flange and four long studs extending to the top of the cylinder where they engaged an X-shaped hold-down bracket.

SPECIFICATIONS – OX- through OX-5

Eight cylinder, 90° vee-type, four-stroke, rated at 90 horsepower at 1,400 rpm.

Bore	4"
Stroke	5"
Length	55-3/8
Width	29-3/4
Width at mount	12-7/8
Bed bolt centers	12-5/32
Compression ratio	5.4-to-1
B.M.E.P.	105.0 lbs/sq. in.
Torque	349 lb. ft.
Weight – dry	385 lbs.
Wt./hp	4.2 lbs.
Wt./cu. in. displacement	0.778 lbs.
Fuel consumption	9 U.S. gallons per hour
Oil consumption	0.035 U.S. gallons per hour

ARTICLE BY K. M. MOLSON
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JOURNAL

AAHS

AMERICAN AVIATION HISTORICAL SOCIETY

P. O. DRAWER 456, CHATSWORTH, CA. 91311

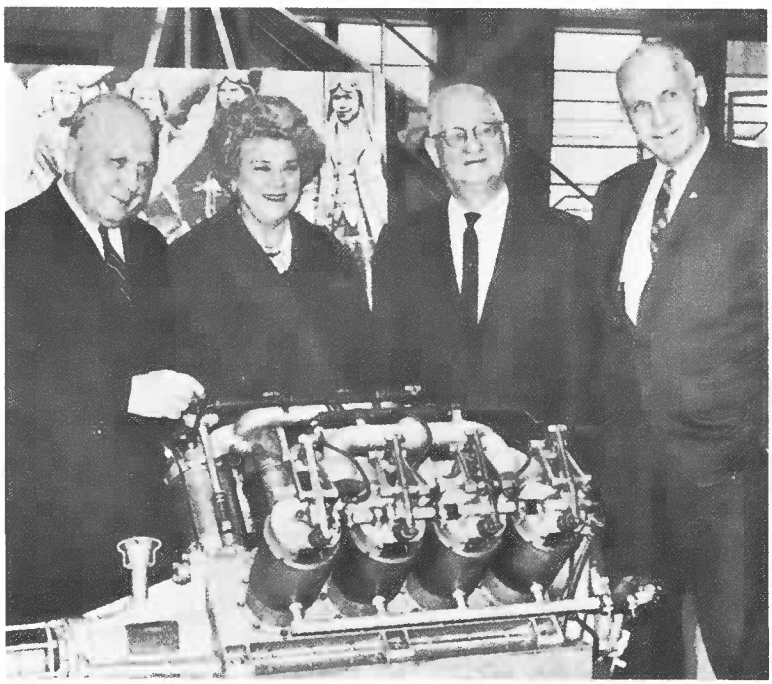
On April 27, 1977, United Airlines paid homage to its humble beginning in the Eastern United States which occurred a half century ago. On April 21, 1927 a local auto dealer and aviation enthusiast, Clifford Ball, started Clifford Ball Airlines at Bettis Field, which he imaginatively called "The Path of the Eagle." Using fabric-covered open-cockpit Waco biplanes, Cliff began to fly mail over the 127 mile route to Cleveland, Ohio, via Youngstown.

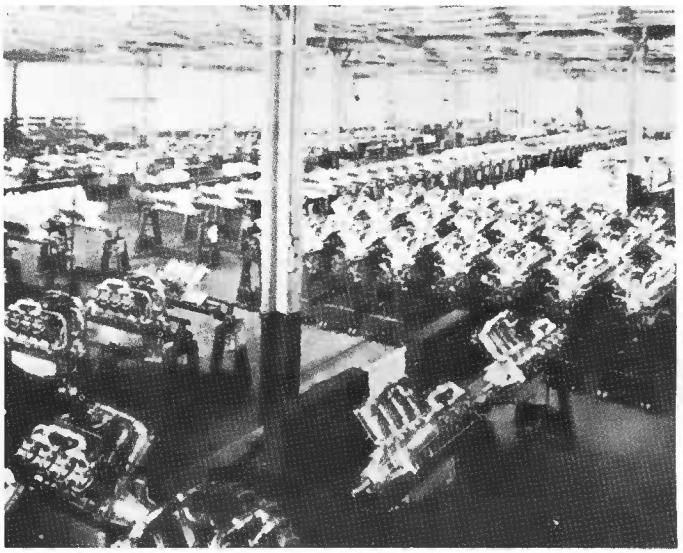
Mr. William E. McGarry, Vice President of United's Great Lakes Region, presented Mrs. Helen Ball, Cliff's widow, with a model of a Boeing 747 in recognition of Cliff's contributions to the development of Aviation and the symbolic growth of the air transportation industry in the past 50 years.

More than two dozen political and civic leaders attended the ceremonies along with aviation pioneer Clayton Bruckner, builder of the original Waco airplane, Cliff's close friend, Johnny Evans, and D. Barr Peat, Jr., son of Barr Peat, an early associate of Cliff's, and many others.

This photo was taken several years ago and shows left to right, Jack Morris, only survivor of the original pilots, Blanche Noyes, widow of Dewey Noyes, one of the original pilots, Cliff Ball and D. Barr Peat.

The photo in the background, taken on the day of the first airmail flight, shows the four original pilots: Kenneth "Curly" Lovejoy, Dewey Noyes, Merle Moltrup, and Jack Morris.



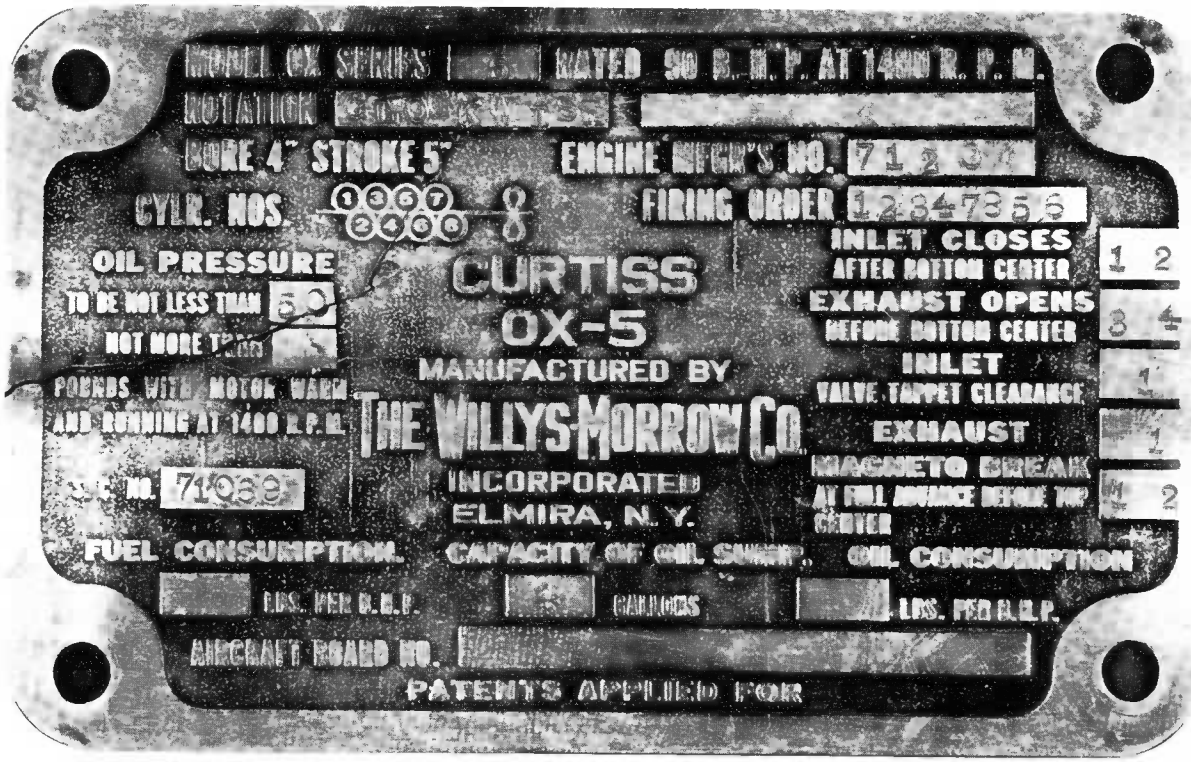


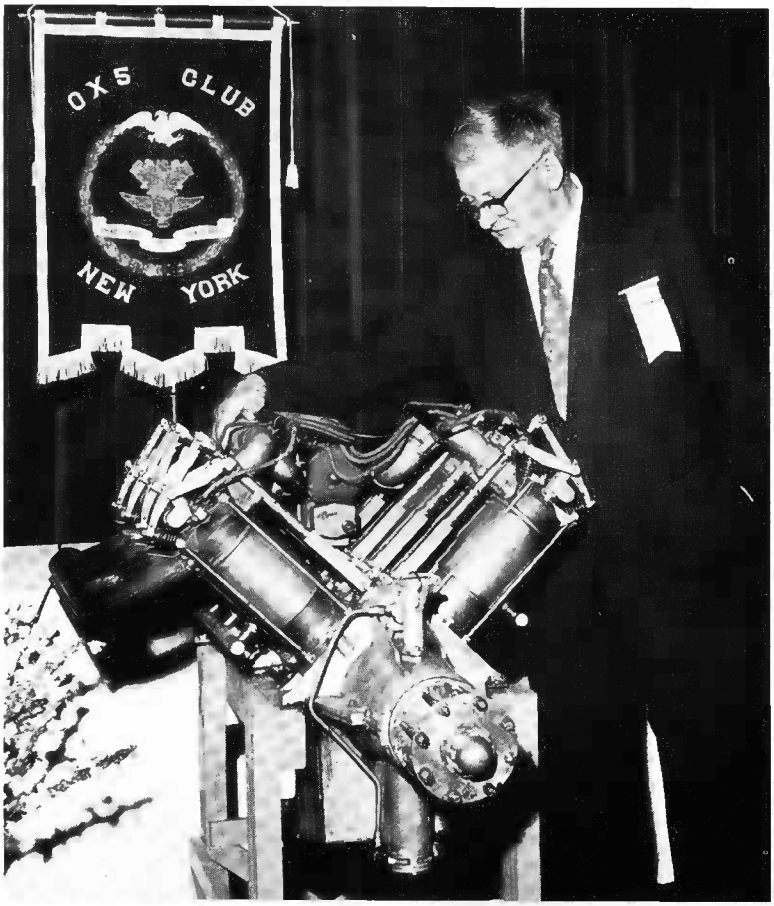
WHEN OX5'S WERE IN BLOOM
Here is a shot of the Willys-Morrow Plant, Elmira, N.Y., who at the height of production, built and shipped more than 50 OX5 engines per day. It is said that more OX5 engines were built in this plant than at any other plant in the world.

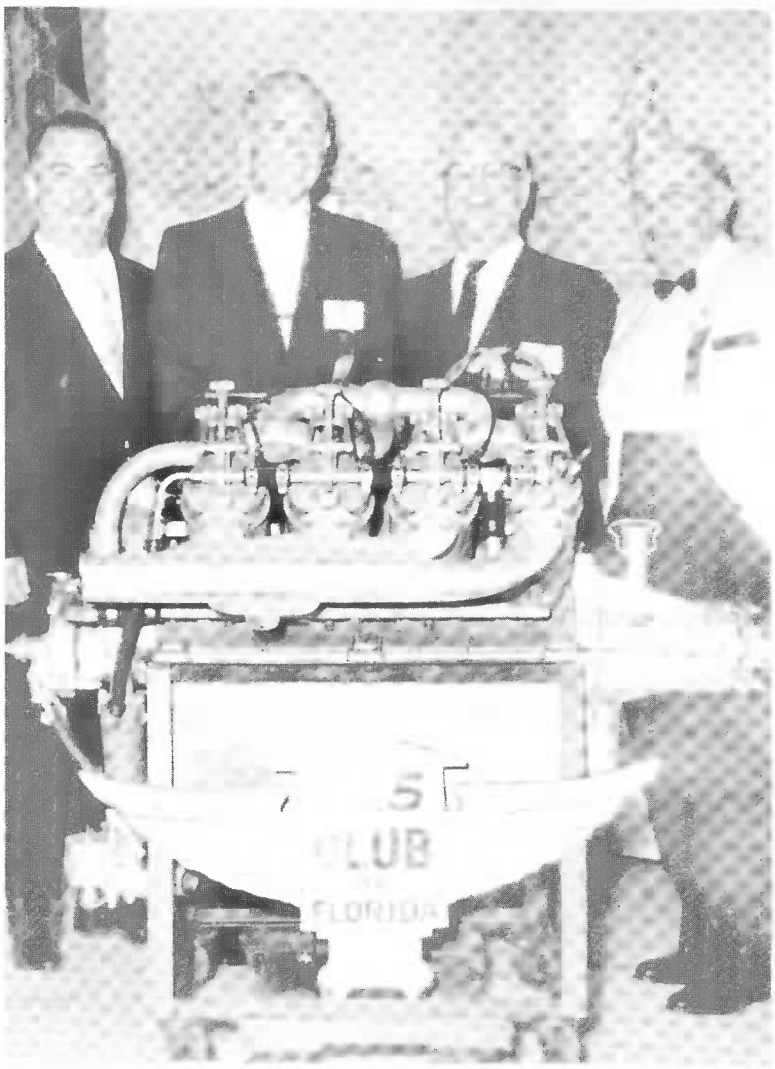
Pix by Courtesy — Dick Kurzenberger

Herbert O. Fisher — Abby Haddaway — Johnny Livingston inspecting an OX5 engine at the New York Wing Meeting, 1957.

OX5 Display — Maryland Wing







CURTISS
Handbook on Setting Up
and Caring for the
Curtiss Aeronautical
Motor
Model OX
Copyright, 1916 by
Curtiss Aeroplane and Motor Corporation

Important Don'ts

1. Don't forget that "A stitch in time saves nine."
2. Don't forget to inspect the motor thoroughly before starting.
3. Don't try to start without oil, water, or gasoline; all three are vital.
4. Don't forget to see that the radiator is full of water.
5. Don't get dirt or water into the oil.
6. Don't get dirt or water into the gasoline.
7. Don't forget to oil all exposed working parts.
8. Don't try to start without retarding the magneto; a serious accident may result.
9. Don't try to start without turning on the switch.
10. Don't start the motor with throttle wide open.
11. Don't run the motor idle too long; it is not only wasteful but harmful.
12. Don't forget to watch the lubrication; it is most essential.
13. Don't forget that the propeller is the business end of the motor; treat it with profound respect — especially when it is in motion.
14. Don't cut off the ignition suddenly when the motor is hot; allow it to idle for a few minutes at low speed before turning off the switch. This insures the forced circulation of the water till the cylinder walls have cooled considerably and also allows the valves to cool, preventing possible warping.
15. Don't fail to study the trouble charts in this book before you molest a thing about the motor, if you have trouble.
16. Don't develop that destructive disease known as tinkeritis; when the motor is working all right, let it alone.
17. Don't forget a daily inspection of all bolts and nuts. Keep them well tightened.
18. Don't fail to stop your motor instantly upon detecting a knock, a grind, or other noise foreign to perfect operation. It may mean the difference between saving or ruining the motor.
19. Don't fail to study this instruction book thoroughly.

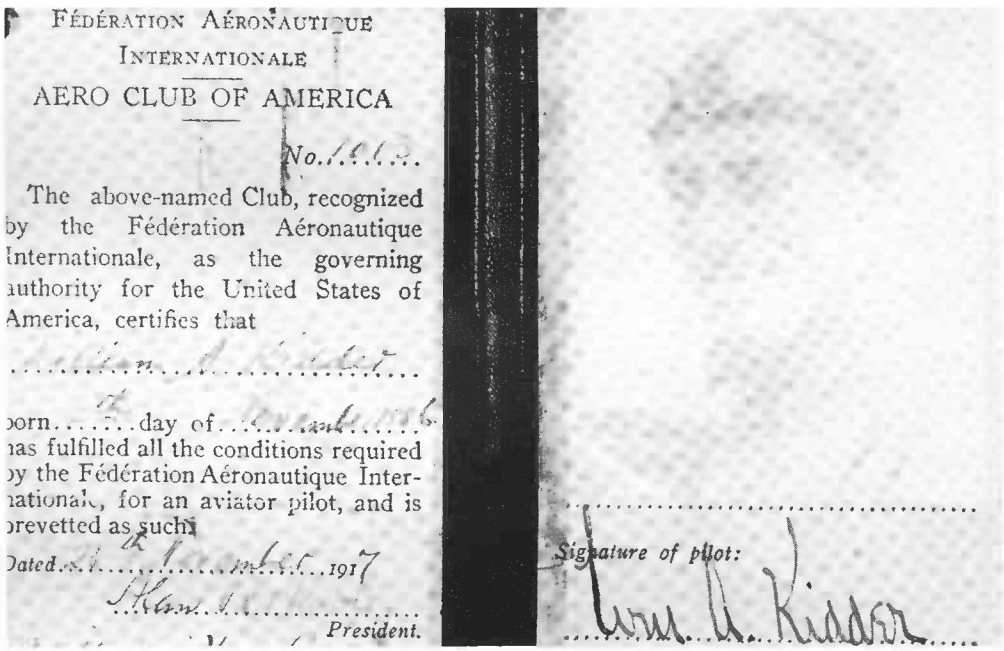
Above Left: Henry Kleckler of Bath, N.Y., shown at an OX5 New York Wing Meeting in 1957, looking over an OX5 engine. He is deceased, but was an early employee of Glenn Curtiss in the development days of the OX5 engine, joining Curtiss in 1907.

AIRCRAFT USING OX5 ENGINES

Aeromarine Klemm
Air King Bi-plane
American Eagle Bi-plane — 3 place
American Eagle — 2 place trainer
American Eagle Monoplane
Berlinger Monoplane
Bird
Butler Blackhawk
Canuck
Challenger
Coffman Monoplane
Command-aire
Crites
Curtiss Robin
Eaglerock
Fisk Triplane
Granville Brothers Bi-plane
Hartman Bi-plane
Hardwick
International — X 17
Jenny — JN-4
Kreider Reisner
Lincoln P. T.
Lincoln Business Sport
Linert — All metal bi-plane
Morton Nightingale
Navy Dirigibles and Blimps
Overcashier
Parks Trainer
Standard
Starling
Stearman
Swallow
Ta-Ho-Ma
Travelair
Thunderbird
Waco

Many home builts and racers used the OX5 engine

ARETZ



FÉDÉRATION AÉRONAUTIQUE
INTERNATIONALE
AERO CLUB OF AMERICA

No. 1...

The above-named Club, recognized by the Fédération Aéronautique Internationale, as the governing authority for the United States of America, certifies that

.....

born.....day of.....
has fulfilled all the conditions required by the Fédération Aéronautique Internationale, for an aviator pilot, and is brevetted as such.

Dated.....1917

.....
President.

.....

Signature of pilot:

Early license — issued to William A. Kidder, in 1917.

Dewey Noyes, early Air Mail Pilot.

O. R. Haueter — Asst. Sales Manager and Test Pilot, Alexander Aircraft Co., Colorado Springs, CO, 1926.

Jack Felger's Farm — 1925 (left auto) Joe Malloy — Charles B. Carroll (rear plane) Carl Strickler and (front plane) Eddie Anderson (standing car top right auto) Jim Waller.

Curtiss Robin OX-5 1929

This is a photo of a plaque, dedicated in 1965, to commemorate the 10th anniversary of the founding of the OX5 Club at Latrobe in 1955. Pictured in the photo are Paul Garber, Smithsonian; Charlie Carroll who was host at the first OX5 meeting, Clifford Ball, then National Secretary and Pete Goff, then National President.

Life members, as the title implies, receive all the rights and privileges of membership as long as they live. They own a life subscription to the OX5 NEWS, and carry a special gold plated Life Membership card, engraved with their name and membership number.

History of the OX5 Aviation Pioneers

In June of 1955, Charles B. Carroll, then operator of the Latrobe, Pennsylvania Airport, appeared before the Aero Club of Pittsburgh. He approached Clifford Ball, then Manager of Greater Pittsburgh Airport and President of the Aero Club of Pittsburgh after the meeting, and suggested they arrange a rally for OX5 pilots.

The purpose of the meeting was to round-up old time Pennsylvania aviation people, and to honor them for the part they played in laying the foundation of the aviation industry as we know it today.

Cliff Ball agreed to spearhead the project, which was, at the time, not expected to be more than of local interest.

Charlie Carroll welcomed the opportunity to host the aviation pioneers and a meeting was arranged at Latrobe Airport on August 27, 1955, with a luncheon, banquet and lodging made available at the Mission Inn.

Word of the rally began to spread. Realizing that there might be a need for a record of those who attended in case another get-together might be desired, Cliff Ball prepared some temporary application forms which were printed in the office before he left for Latrobe.

Temporary officers were selected until a formal election could be held. Russ Brinkley was appointed President, Clifford Ball was appointed Secretary, and Charlie Carroll was appointed Treasurer.

When the affair was over, 87 persons had signed the application forms, and 20 more had signed the forms, and mailed them in to the office, with a total of 107 to form the nucleus of the OX5 Club. At that time the OX5 Club of America came into existence and the parent club became the OX5 Club of Pennsylvania.

Word of the Club began to spread like wildfire. By the end of 1956 the total membership was 990, and by the end of 1957, 3259 more applications were received, bringing the total membership to 4249, the largest growth in any one year of the club's existence. Membership also spread to several foreign countries. To date we have enrolled over 12,800 members.

Wing charters were issued with the District of Columbia receiving charter #1, Virginia charter #2, California charter #3, and Florida charter #4. By the end of 1957, twenty-two wings had been chartered.

On May 15, 1971, the OX5 Aviation Pioneers Hall of Fame was inaugurated. A long-time dream of Johnny Evans of Pennsylvania and one of the founding members, the Hall of Fame was made an important part of the OX5 Aviation Pioneers by then National President Karl E. Voelter of Florida. Since then 202 distinguished aviation people who have contributed significantly to the progress, growth, or safety of aviation on a national scale, have been honored for their exploits. The Hall of Fame has attracted attention throughout the world and has contributed significantly to the prestige and prominence of the OX5 Aviation Pioneers.

In addition, the OX5 Aviation Pioneers conduct an Awards Program which also pays tribute to outstanding contributions of its members to the OX5 Aviation Pioneers and to aviation.

Each year a national reunion of OX5 Aviation Pioneers is hosted by one of the wings of the organization. The reunions attract much attention as many members from all parts of the country gather to renew old acquaintances and relive the golden days of yore.

Photo Below:
Curtiss Field, Miami, Florida, January, 1918

The Curtiss Flying School
Standing, fifth from left, Rodman Wanamaker, sixth from left, Pat Patterson, (instructor). The girl standing, fourth from right, is Nita Snooks, who later, reportedly, instructed Amelia Earhart. Seated, first left, A.J. Chalmers.

History and Purposes

The OX5 organization, which began as a two-man conversation, was founded at Latrobe, Pennsylvania, on August 27, 1955. On August 22, 1956, it was Registered and Enfranchised in the Commonwealth of Pennsylvania as the OX5 Club of America. The name has since been changed to OX5 Aviation Pioneers. It currently has enthusiastic groups of members in each of the 50 states and other parts of the world. Satellite clubs have been or are being established in each state, for the convenience of members. As a member of OX5 you will be entitled to both National and State organization affiliation. Annual dues cover, in addition to the initiation fee, a subscription to the OX5 NEWS.

The OX5 Aviation Pioneers is organized exclusively for the following educational and scientific purposes:

(1) To compile and record in detail the historical and educational history of the development of air transportation.

(2) To perpetuate the memory of pioneer airmen and their great sacrifices, their accomplishments and contributions to the development of civil aviation and to do honor to all who pioneered in aviation, especially to (i) the thousands of pilots who learned to fly and operationally flew aircraft powered by the OX5 engine and (ii) persons who owned, were associated with, or who participated in the design, construction, repair and maintenance of OX5 powered aircraft prior to December 31, 1940.

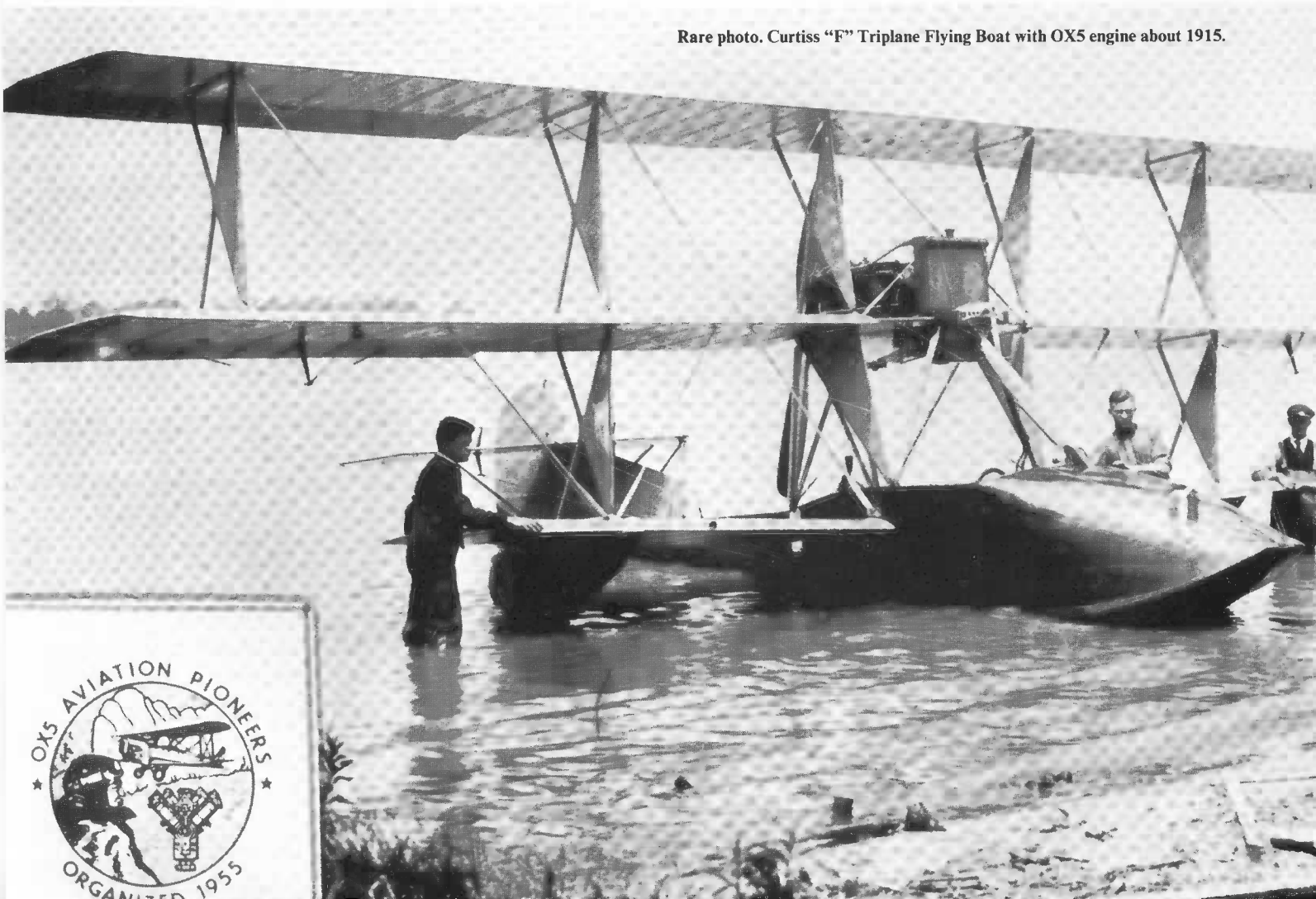
(3) To support projects and programs designed to increase safety and efficiency in use of aircraft.

(4) To publish historical resumes and other information consistent with the educational objective.

(5) To encourage the establishment and operation of aviation museums and the collection of aviation memorabilia, particularly of the 1920-1940 era.

(6) To establish and maintain suitable ways of recognizing and honoring the names and achievements of aviation pioneers.

Rare photo. Curtiss "F" Triplane Flying Boat with OX5 engine about 1915.



OX5 AVIATION PIONEERS — WHO ARE YOU? — Originally Written by Robert P. McComb

First, the typical OX5 member had to be born with the curiosity of Magellan, Columbus, and DeSoto. He had to have the physical and mental dexterity of Harry Houdini. He learned at a tender age to earn a day's wages.

He had to be a master mechanician, which meant he had to be able to cure malfunctions before they occurred. He had to be a weather forecaster and analyst. He had to know crops at all stages of growth, texture of the soil, lest he nose over in soft terrain. He had to be a plumber to prevent leaks in his cooling system. He had to know the best fuel obtainable for good combustion and maximum power without detonation, and he had to know the best lubricants to better smooth the pores of bearing surfaces to lessen friction and aid cooling. A master rigger who could sight-in such things as wash-in and wash-out, so the forces would balance out in flight. He determined proper tensions of brace wires and cables by strumming, making adjustments and strumming some more. He was a welder and sheet-metal worker.

He had a willingness to adjust himself to the techniques of a seamstress — which enabled him to apply new fabric to his machine or simply sew shut a fabric tear by baseball stitching.

He was willing to cause himself extra toil as he cut holes in his fabric to inspect important structural members and, satisfied, sew them up again, long before the days of inspection plates and quick fasteners. He knew wood; what kind to use, texture, grain and moisture content. He knew woodworking techniques similar to that of the finest cabinetmakers and was capable of making a safe splice to a spar or longeron in the pasture or stubblefield. Some learned how to repair farm fences. Some learned *that* voluntary gesture reaching for hip-pocket billfold to pay the farmer for damaged grain before it was taken out of hide. He had to keep the farmer on his side because, without such cooperation, there would have been no base of operation.

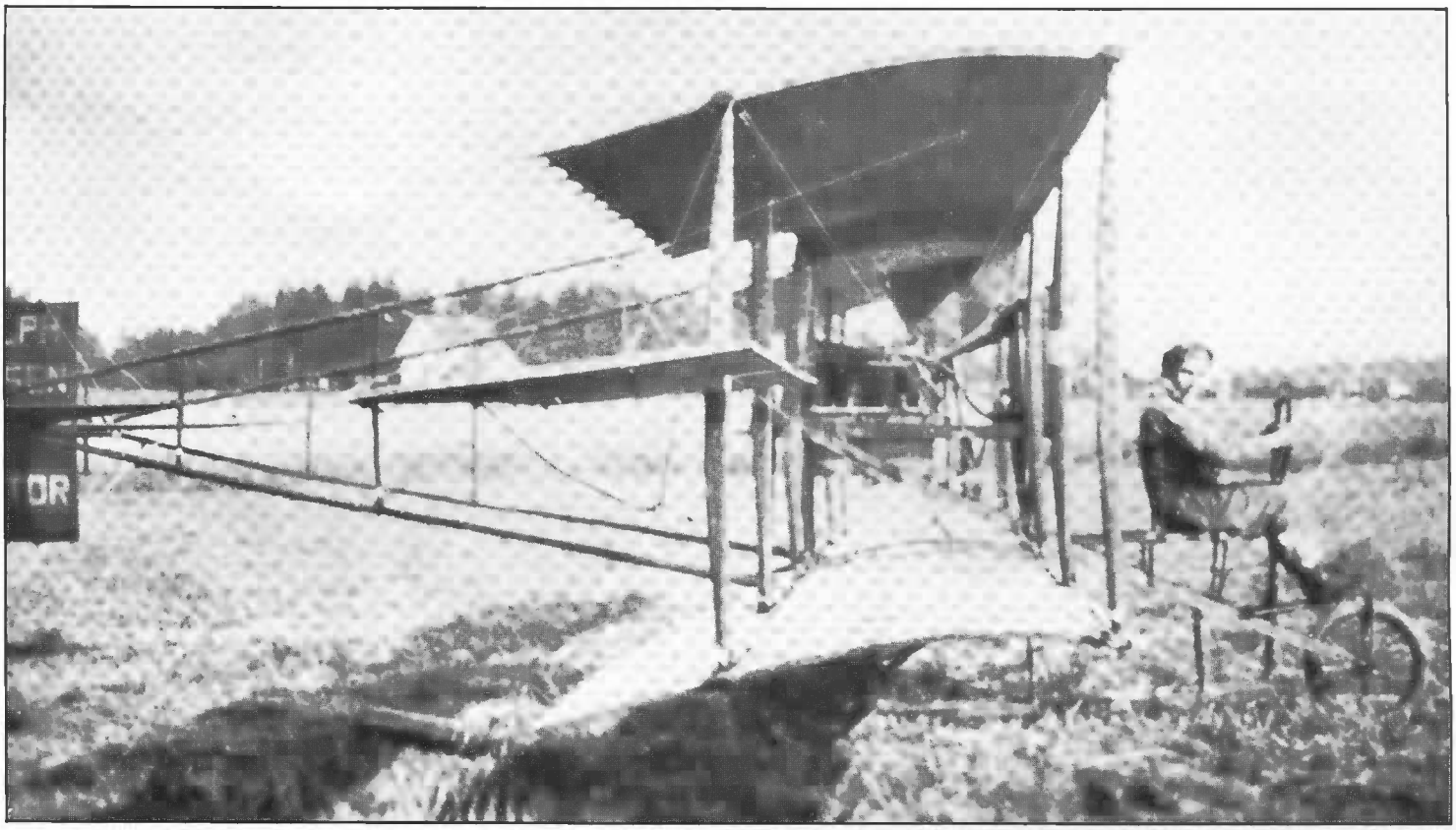
The OX5er was a painter, whether by spray gun or brush, to keep his fabric airtight, waterproofed, smooth and taut for ultimate performance. He kept his physique in good trim by swinging the tail around by hand to point the nose toward open country. Also by cranking his more-often-than-not, stubborn, Curtiss OX5 engine.

The typical OX5er came to know the importance of bringing into phase all components of power output at peak level at all times. This, he knew, he started with a good power section to deliver good compression, followed by good carburetion, ignition, valve-action, cooling, lubrication, and keeping his prop tracked and balanced, all working together in perfect accord so the engine would deliver enough thrust. Philosophically, this gave him a keen insight into the power of organization of men, and caused him to become a leader instead of a follower. He had to have some knowledge of drafting, geometry, physics and chemistry. He had to be an excellent navigator even before the days of fairly accurate charts. He worked with mathematics and English constantly, and some times his work called for knowledge of foreign languages. He was a businessman as he kept finances in balance by good sales practices while keeping expenses under control. He had to be a ham actor at times to outsell the barnstormer next to him. Some were excellent showmen promoting their wares. He was a practical psychologist imparting knowledge to others so they, too, might ply the trade and expand the industry.

His safety mindedness came to have wide influence in industry — even on the production lines — and found its way into all modes of transportation. He trained his eye to see everything far and wide as well as close at hand — never missing a thing incidental to doing his chosen work splendidly. He was one who had humble appreciation for his vantage point which relatively few men had for seeing all of God's creation. He became rugged in spirit because of undue hardship, and he took on never-ending patience toward circumstance and his fellowman because of it. He was always the patriot ready to answer the call to the service of his country if, when and how needed and it is from this hardy stock that came many volunteers to fight wars, skirmishes, and border incidents, after the airplane came into its own — militarily.

The typical OX5er knew, by virtue of having learned the rights and wrongs of his many-sided professional techniques and dealings, the right from wrong sides of political, spiritual and moral struggles; a man quick to tell the world what he thought in accordance with human law as handed down. And in his acute sense of common decency, he tried to do and say what he thought was right.

He learned his art by his own hand and at his own expense, to qualify at no training cost to Uncle Sam, to train a mammoth Air Force. Without him, there would have been too few ready-qualified instructors to have trained pilots as fast as needed to win both great wars. He maintained his flying proficiency before World War I, and between both great wars, because of sheer love of flying — trying to make his living this way — sometimes against great odds — being hungry and cold and too proud of his profession and himself to ask for h elp. It was with grit, courage and determination that he held on through the trying years, because he knew through vision and foresight that the day would come for air transportation to soar to heights of unbelievable development within his lifetime.



Somehow surviving the depression years, and with the buildup of unrest in Europe leading to World War II, many OX5ers, with mechanics' certificates in hand, entered our fighter, bomber, and other defense plants. They fanned out to all kinds of jobs ranging from executive to less glamorous mission-support duty — however needed in the interest of winning the war as soon as possible. Many OX5ers went into combat. Many lost their lives too early to have joined this organization after its founding.

OX5ers plied above the waters of the North Atlantic in all kinds of weather to deliver our bombers quickly, as they came off the assembly lines. OX5ers trained our bombadiers and followed them into combat to see for themselves that their training techniques were correct. Many OX5ers helped lubricate our war machinery — especially our fighters, bombers, and training planes. Some whipped our pilot training program into frenzied gear-ratio heretofore unknown to man — training 200,000 pilots. Other OX5ers directed the program for Civil Pilot Training (CPT), and War Training Service (WTS), at the local college level. And even women trained other women to fly vital Air Force mission-support objectives.

OX5ers PIONEERED today's journeys to the moon and to those space exploits soon to come — so far reaching — such vast distances to challenge the imagination of any man. It has not always been jets and rockets! Many OX5ers blaze the trail. Somewhere after the dawn of civilization, someone had to crawl before others could walk. Some had to walk before others could run. Someone had to discover camel, elephant or horseflesh and harness them, before others could ride. Someone had to invent the steam engine so we could sail by steamship or travel overland by train. Someone had to devise an internal combustion engine and couple it to framework complete with running-gear, steering apparatus, braking action and seats, to give us the automobile.

Many had a hand in building on the concept that a heavier-than-air machine might one day fly. Someone had to make the first start into the air before others could do sustained flight. Following experiments with curved flight, someone proved that sustained flight along the straightaway course was practical for world navigation and that it could be done safely and profitably to better the circumstance of man.

The OX5 Aviation Pioneers embrace a great number of men and women who spent many years in the development of this industry — across those lean, depression years — showing progress through the free enterprise system at times when it was nearly impossible to sell the American public, and absolutely impossible to sell to successive administrations in Washington.

During the time of this writing, and for years, as a matter of fact, the question still arises as to how the OX5 Aviation Pioneers might be perpetuated, what organization of younger men and women might take over the reins as we depart this life.

Year after year it has been indelibly inscribed in the minutes of our national meetings that the OX5 Aviation Pioneers shall exist only through its last member. Yet, the matter may turn about, when and if a more logical conclusion can be found. It hasn't been — yet.

We do know, however, that there still are many previous OX5 pilots and mechanics who should be on our membership rolls, and to this group we say — come and join us. We have a great organization, which continually brings honors to its members, and always great respect, especially from those who wish they could be one of us.

Surely, you will want to join — if you qualify. If so, we welcome you aboard.

National Board of Governors member, Mr. Gerald Francis of Lansing, Michigan, designed this beautiful and meaningful OX5 Aviation Pioneers Plaque.

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(OX5 AVIATION PIONEERS)

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Hubert H. Stark (W.Va.)

Founded in 1955 — the organization had temporary officers the first year consisting of Russ Brinkley, President — Clifford Ball, Secretary — Charles B. Carroll, Treasurer.

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Corrected to February 25, 1985

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William K. Kaiser (L), Curator, hands George C. Dade, Director of new Cradle of Aviation Museum on Long Island, the New York State OX5 plate which was recently assigned to him by the Motor Vehicle Bureau. In the background is Lindbergh's restored "Jenny" which was his first plane and the one in which he made his first solo flight. It was purchased for $500 at Souther Field, Americus, Georgia, in 1923. The "Jenny" was restored by the Long Island Early Fliers Club in Dade's basement while he was president 1973-1976. (See OX-5 News, February 1976)

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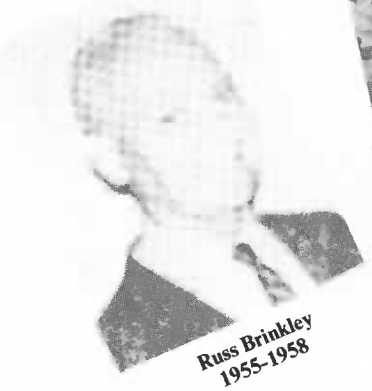
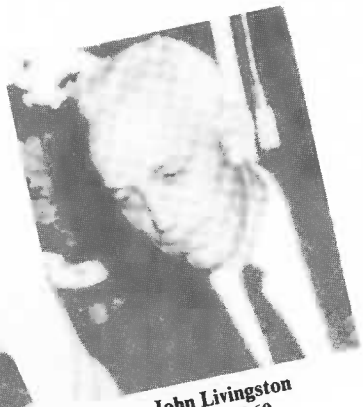
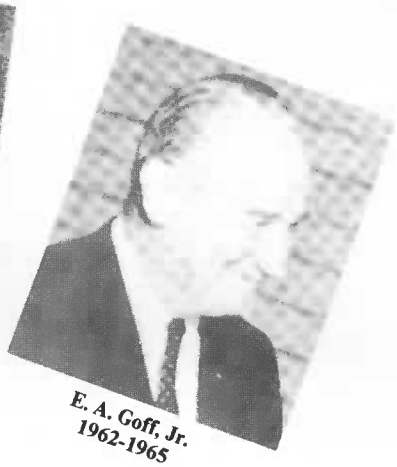


Russ Brinkley
1955-1958



John Livingston
1959-1960

Jimmie Mattern
1961



E. A. Goff, Jr.
1962-1965

William Atwood
1966

Art Goebel
1967-1968

John P. Morris
1969-1970

Karl Voelter
1971-1972

Buril Barclay
1973-1974

Oliver Phillips
1975-1976

Nick Rezich
1977

Foster Lane
1978

Wilson Mills
1979-1980

Jim Richter
1981-1982

Paul McCully
1983-1984

Robert F. Lang
1985

* — Deceased

OX5-ers First

WOMAN ATTEMPTS FIRST FLIGHT ACROSS NORTH ATLANTIC
1927

RUTH ELDER
1904-
United States

CAPT. GEORGE HALDEMAN
1898-
United States

RUTH ELDER, accompanied by CAPT. GEORGE HALDEMAN, pilot, in October, 1927, was the first woman to attempt a flight from the United States to Europe. They took off from Roosevelt Field for Paris, France. Over the North Atlantic they encountered severe storms. Their plane was driven from its course. For 28 hours they battled against raging elements during which time Miss Elder spent 9 hours at the controls. Finally a forced landing was made on the ocean about 360 miles northeast of the Azores after a flight of 2,623 sea miles. Miss Elder and Capt. Haldeman were rescued by a Dutch oil tanker. In hoisting their plane to the deck of the ship, it caught fire and was totally destroyed (including all airmail carried on the plane).

FIRST CIVILIAN AERONAUTICAL ENGINEER IN UNITED STATES ARMY
1915

GROVER LOENING
1888-
United States

GROVER LOENING born September 12, 1888, learned to fly in 1911 and thereafter became one of the outstanding consulting aeronautical engineers in America. Throughout his career he has done much to bring the United States to the forefront in aviation. In 1913, he was assistant engineer to Orville Wright and in 1915 became the first civilian aeronautical engineer of the U.S. Army Signal Corps. During 1918, he established the Loening Aeronautical Engineering Company of which he was president. As a builder of airplanes and seaplanes he became well known all over the world. Five Loening amphibions with Liberty, 400 h.p., engines made a 34,770-kilometer flight, under Maj. W.A. Dargue's leadership, December 21, 1926 to May 2, 1927, flying from San Antonio to Buenos Aires and back to Washington, D.C. He wrote: "Monoplanes and Biplanes" (published, 1910), "Military Airplanes" (1917), "Our Wings Grow Faster" (1935).

WINS FAMOUS DOLE AIR DERBY TO HAWAII
1927

ARTHUR (ART) C. GOEBEL
1893-
United States

ARTHUR (ART) C. GOEBEL, piloted the "Woolaroc" plane with Lt. W.V. Davis, United States Navy, as navigator, successfully across 2,400 miles from San Francisco to Honolulu and won first prize in the notable Dole Race, Aug. 16, 1927. This was one of the three American flying teams to complete the trip and won for them a prize of $25,000. They covered the distance in 26 hrs., 17 min., 33 sec. Before and during this race, 10 fliers were killed; two planes were lost. The second prize was won by Jensen and Schluter. On Sept. 13, 1928, "Art" Goebel with H. Tucker, in their plane, "Yankee Doodle," were the winners of the first transcontinental nonstop air race from New York to Los Angeles, Calif.

ATTEMPTED ROUND-THE-WORLD FLIGHT
1932-1933

JAMES MATTERN
1906-
United States

LIEUT. BENNETT GRIFFIN
1895-
United States

JAMES MATTERN and LIEUT. BENNETT GRIFFIN took off from Floyd Bennett Field, July 5, 1932, in an attempt to beat the world record held by Post and Gatty. They landed in Berlin on the first leg of the flight, after flying 29 hours, 31 minutes via Harbour Grace. This was the first nonstop flight from New York to Berlin — a distance of 4,106 miles. They reached Minsk but crashed on the take-off to Siberia and the flight was abandoned. On June 3, 1933, James Mattern attempted a solo flight around the world. He flew nonstop to Jomfruland, Norway, in record time. His next stop was Moscow. Later he crashed near Anadyr, Siberia.

*** OX5-ers First ***

RECORD-BREAKING BARNSTORMING PILOT WINS IMPORTANT AIR RACES
1924

BASIL LEE ROWE
1896-
United States

BASIL LEE ROWE, born in Shandaken, N.Y., February 10, 1896, a noted barnstormer and exhibition pilot who won several important air races held from 1924 to 1926. He learned to fly at Hempstead, N.Y., in 1916-18, and became a barnstormer-exhibition flier in the United States, Mexico, West Indies, and Central America, operating the Rowe Flyers from 1919 to 1927. Captain Rowe was winner of the Town and Country Club Trophy, International Air Races, Dayton, Ohio; Allen Hinkle Trophy; and Glenn Curtiss Trophy. He established the first airmail and passenger service in the West Indies, also West Indian Aerial Express, 1927-28. Since 1928, he has been a captain in Pan American Airways System, Miami, Fla.

ESTABLISHES WOMEN'S FIRST SOLO ENDURANCE RECORD FLIGHT
1927

VIOLA GENTRY
1900-
United States

VIOLA GENTRY was born in Gentry, N.C., June 13, 1900. She first learned to fly at Roosevelt Field, L.I., N.Y., in 1925 receiving private pilot certificate No. 1822. In 1927, she became distinguished through establishing the first official solo endurance record for women. She did much valuable work in organizing women's interests in aviation and inspired many young American girls to enter that field. Viola Gentry was a charter member of the Ninety-Niners, and also a member of the Women Flyers of America. She was Vice-President of the Women's National Association of Aeronautics and acted as observer of international world records at Roosevelt and Floyd Bennett Fields.

ANGLO-AMERICAN CORONATION FLIGHT
1937

HENRY T. (DICK) MERRILL
1897-
United States

JACK LAMBIE
1909-
United States

DICK MERRILL, and JACK LAMBIE, co-pilot, made the first fully successful round-trip crossing of the North Atlantic by Lockheed Electra monoplane, with a Pratt and Whitney SH-1 engine, May 8-14, 1937. This flight was known as the Anglo-American Good Will Coronation Flight. It was made in honor of the coronation of King George VI and Queen Elizabeth of England. The American fliers took off from Floyd Bennett Field and made the crossing in the record time of 20 hours, 27 minutes, and 45 seconds. They attended the coronation in London and took off from South Beach, Liverpool and made the return flight to New York City in 24 hours, 22 minutes, and 25 seconds, which included a 22-minute stop at Squantum, Mass., to check their fuel supply.

RECORD BREAKING NONSTOP TRANSOCEANIC FLIGHT, UNITED STATES TO SPAIN
1929

ROGER QUINCY WILLIAMS
1894-
United States

CAPT. LEWIS A. YANCEY
1895-1939
United States

ROGER QUINCY WILLIAMS, born in Brooklyn, N.Y., on April 30, 1894, broke the world's record for over-water flying on July 10, 1929, when, accompanied by LEWIS YANCEY, co-pilot and navigator, he made a nonstop trans-atlantic flight from Old Orchard, Maine, to Santander, Spain. They used a Bellanca monoplane "Pathfinder" and were in the air for 31 hours and 30 minutes on a 3,400-mile course. After minor repairs, they continued to Rome, Italy. Roger Quincy Williams learned to fly in 1914. On June 29-30, 1930, he made a nonstop flight from New York City to Bermuda and return with Boyd and Connor. Captain Yancey, who died in 1939, was not only an expert pilot but a well-known navigator. He flew to Bermuda in 1930 and made a 50,000-mile trip in an autogiro in 1933.

*** OX5-ers First ***

NEW YORK-NORWAY AMPHIBION FLIGHT
1935

THOR SOLBERG
Norway-U.S.A.

THOR SOLBERG, a skillful Norwegian pilot, planned in 1932 to be the first man to fly from the United States to his native country, Norway. He made his first attempt in a Bellanca plane on Aug. 31, 1932, and was accompanied by Carl Peterson. Unfortunately, in Newfoundland, his plane crashed and the attempt failed. Undaunted by this catastrophe, he started careful planning for a second flight. On Aug. 8, 1935, he took off from New York for Bergen, Norway, via Greenland using an amphibion plane, "Leiv Eiriksson." He flew in easy stages, taking one month to complete the flight. His flying boat, which he called an air-yacht, was luxuriously equipped. On arrival in Bergen, Norway, from Reykjavik, Iceland, the Norway government used a special large roller cancellation on the mail carried bearing the inscription "Solberg's Flight, 1935, U.S.A. — Norge via Liev Eiriksson."

RECORD TRANSCONTINENTAL FLIGHT
1931

JAMES H. DOOLITTLE
1896-
United States

JAMES H. DOOLITTLE, Lieut
General, U.S. Army Air Forces, was bor
in Alameda, California, on Dec. 14, 1896
He made a record transcontinental flight
Sept. 4, 1931, during the National Ai
Races. He flew from Burbank, Californi
to Newark, New Jersey in 11 hours an
15 minutes, beating the Hawks record b
1 hour, 10 minutes and 3 seconds. Genera
Doolittle learned to fly in 1917-18. I
1925, he won the Schneider Trophy Rac
and was awarded the Mackay Trophy. O
Sept. 24, 1929, he was the first pilot t
take-off and land an airplane when flyin
blind under a cockpit hood with the aid o
instruments. The Harmon Trophy wa
awarded to him in 1929. He set a world'
land plane speed record of 296 m.p.h., o
Sept. 3, 1932. Doolittle returned to activ
service in the Army before the attack o
Pearl Harbor. Later he organized an
trained a group of pilots to take-off wit
twin-engined Mitchell bombers from
carrier. In April, 1942, he led this grou
from the carrier *Hornet* in a surprise a
tack on the Japanese mainland and received the Congressiona
Medal of Honor. In North Africa, he commanded the Strategi
Air Force, and was awarded the Silver Star and Distinguishe
Service Medal.

FIRST NONSTOP NEW YORK-PARIS FLIGHT
1927

CHARLES AUGUSTUS LINDBERGH
1902-
United States

CHARLES AUGUSTUS LINDBERGH, born in Detroit, Mich., on Feb. 4, 1902, startled the world on May 20, 1927, when he made the first nonstop transatlantic flight from New York to Paris in 33½ hrs., a distance of 3,600 miles. He flew solo in the "Spirit of St. Louis," a Ryan monoplane with a Wright-Whirlwind engine, from Roosevelt Field, N.Y., to Le Bourget, Paris. On May 10, 1927, he had established a coast-to-coast record from San Diego, California, to New York City of 21 hrs., 20 min. After his return to America, Charles A. Lindbergh made a nonstop flight from Washington, D.C. to Mexico City in 27 hrs., 10 min. He also made an air tour of 75 cities in the United States and goodwill flights to Mexico, Central America and the West Indies. The United States and many other countries issued special stamps commemorating his flight. He learned to fly at Lincoln, Nebraska, during 1922, and was an airmail pilot during 1926. Alone and with his wife, Anne Morrow Lindbergh, he made many notable surveys and trail-blazing flights in 1930 and 1933. He is the author of the book "We." He has received many high awards and honors.

TRANSCONTINENTAL-RECORD SPEED PILOT
1929

ROSCOE TURNER
1895-
United States

ROSCOE TURNER, born in Corint
Miss., September 29, 1895, learned
fly during World War I, in 1917, ar
has logged over 10,000 hours. He wo
recognition as a sensational transco
tinental speed pilot in 1929, carryin
passengers from New York City to L
Angeles in 20 hrs., 20 min. and retur
ing in 18 hrs., 30 min. In successiv
years 1932, 1933, 1934, he establishe
new continental speed records. Rosc
Turner was three times winner of th
Thompson Trophy, and was secon
(with Clyde Pangborn) in the Spe
Division of the MacRobertson Intern
tional Air Race, London-Melbourn
1934. In 1939, he set a world's reco
for a closed course, 299 m.p.h. He ow
ed and operated the first large-si
Sikorsky Transport Plane. Many of th
high awards for air achievements have been received by him.

*** OX5-ers First ***

PIONEER AMERICAN AVIATOR-INSTRUCTOR
1913

CHARLES S. "CASEY" JONES
1894-
United States

CHARLES S. "CASEY" JONES is widely known and respected figure in American aviation. He started his flying career in 1913 and was an officer and instructor in charge of flying in World War I, during which he saw service with the French Escadrille. In 1919 he joined the Glenn H. Curtiss organization and ran aviation fairs, barn-stormed, taught flying, and was a pioneer test pilot. He was especially successful during the '20s as a racing pilot and still holds Commercial Pilot's License No. 13, with more than 6,000 flying hours to his credit. In 1932 he founded the Casey Jones School of Aeronautics, and in 1940 he established the Academy of Aeronautics. He and his partners in these schools have directed the training of thousands of men for the United States Army Air Forces and the aviation industry.

NOTED CURTISS EXHIBITION PILOT
1911

BECKWITH HAVENS
1890-
United States

BECKWITH HAVENS, born in New York City, May 29, 1890 was among the first of the famous exhibition pilots of the Curtiss School. He learned to fly under instruction from Glenn H. Curtiss at Hammondsport, N.Y., in 1911. From 1911 to 1913 he flew as an exhibition pilot for the Curtiss Exhibition Company. Beckwith Havens, in 1911, made a spectacular flight over Havana, Cuba. He also made the first long-distance flight in a hydroplane from Chicago to New York, flying over the Great Lakes. Havens is credited with being the first to fly up the Hudson River, and in 1928, made the first transcontinental amphibion flight from New York to San Diego, California. During World War I, he was an aviator in the United States Navy. He has done much to advance American aviation and has received awards of merit for his outstanding contributions.

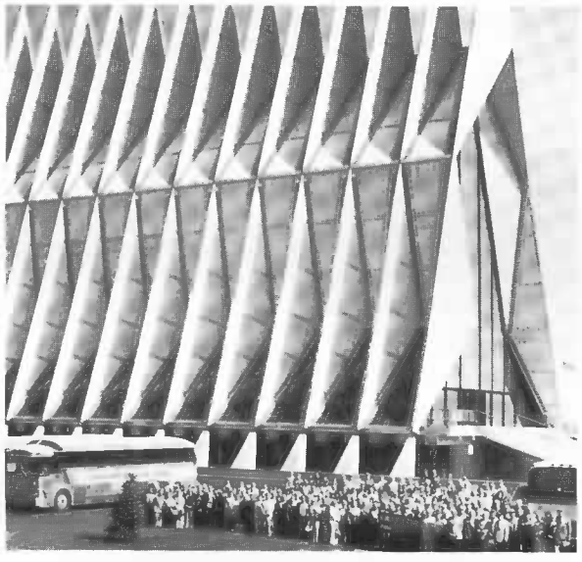
AMERICA'S "ACE OF ACES"
1918

EDWARD VERNON RICKENBACKER
1890-
United States

EDWARD VERNON RICKENBACKER, was born in Columbus, Ohio, Oct. 8, 1890. He learned to fly in France in World War I and was credited with downing 26 enemy aircraft for which he won the title of America's "Ace of Aces." Before joining the Air Corps he was a staff driver for General Pershing with the rank of sergeant. In the Air Corps, Rickenbacker started as a lieutenant and rose to captain of the 94th Aero Squadron in 1918. He was honorably discharged with the rank of major and was awarded the Croix de Guerre with four palms, Legion of Honor Medal, Distinguished Service Cross with nine oak leaves, and Congressional Medal of Honor. In 1934, he broke the transcontinental transport plane record, carrying two pilots and passengers, in 12 hrs. 3 min. 50 sec. He is now President of Eastern Airlines Inc., New York City. In World War II he has visited every combat theater, flying on special missions for Secretary of War Stimson. His bomber was lost over the Pacific and he and his companions floated on two rubber rafts for 22 days before being sighted by a Navy pilot and rescued.

Top Left: Bennett Griffin.
Top Right: George Haldeman
Middle Left: James Mattern
Middle Right: Dick Merrill
Bottom Left: Roger Q. Williams

OX5ers at the Registration Desk, 1973 National Reunion, Dearborn, MI. L-R: Paul McCully, Lloyd Yost, Buril Barclay then President; Johnny Evans, Treasurer; Karl Voelter, Secretary.



OX5ers tour the Air Force Academy facilities at Colorado Springs during the National Reunion, 1978.

National Governors at work at the National Reunion, Seattle, WA, 1979.

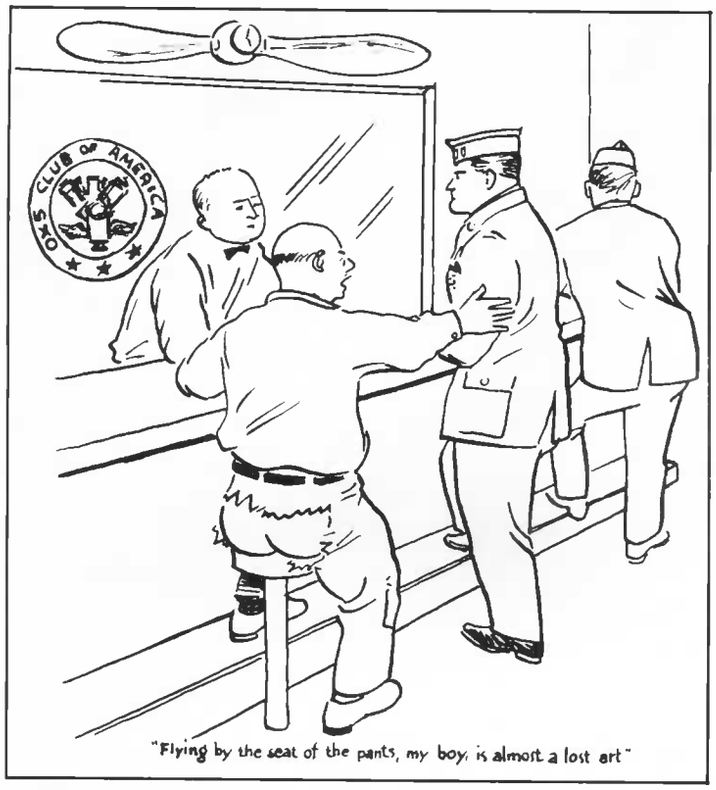
Viola Gentry greets C. R. Sinnie Sinclair and Tex Marshall, both former National Governors, at the 196 Reunion, Fort Worth, TX.

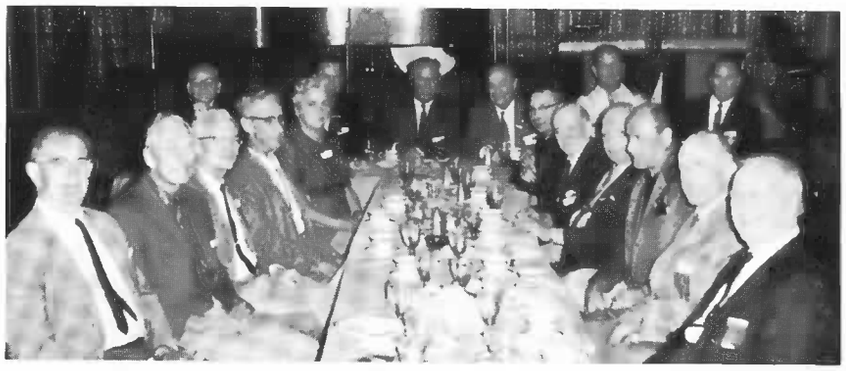
1974 National Reunion, Charleton, SC. A few of the ladies who graced the banquet, L to R: Viola Gentry, Louise Thaden, Tiny Broadwick, Melba Beard, Edna Gardner Whyte Blanche Noyes, Mary Rankin and Jessie Woods.

Some of the gals at the 1976 Awards Banquet, National Reunion, San Diego.

Part of the entertainment at Fun Night — 1965 National Reunion, Chicago.

1975 National Reunion — OX5ers touring the Alamo, San Antonio, 1975. L/R: Bob Bryant, Nall Behr, Mr. and Mrs. Dexter Martin, Howard Behr and Jessie Woods.





National Board Luncheon — National Reunion, Birmingham, AL, 1967.

Art Goebel, Karl Voelter, Pete Goff, and Roger Don Rae at the 1966 National Reunion, St. Louis, MO.

1959 National Reunion, William Penn Hotel, Pittsburgh, PA.

Olga Peiffer, Mr. and Mrs. Chester Danielson, Mr. and Mrs. Gustav Crawford, Mr. and Mrs. Jack Irwin at the dessert cookout, during the Phoenix Arizona National Reunion, 1971.

Clyde Ice, Spearfish, S.D. received his Hall of Fame certificate from National Secretary Oliver V. Phillips (rear) as his three proud sons look on.

National Awards Banquet, St. Louis, MO, 1966, St. Louis Gateway Hotel.

Russ Haldeman, Jimmie [illegible], Johnny Livingston and Tiny Broadwell inspect an OX5 engine at the 1961 National Reunion displayed in the lobby of the Allis Hotel, Wichita, Ks.

Some of the group at the General Assembly meeting, National Reunion, San Diego, CA, 1976, Royal Inn at the Wharf.

OX5er Martin Jenson and other OX5ers enjoy a visit in the cockpit of a C-5A at Kelly Air Force Base during the 1981 Reunion at San Antonio, TX 1981.

OX5 Aviation's Pioneers Hall of Fame

1971

*BERNT BALCHEN
*CLIFFORD BALL
MELBA BEARD
*SAMUEL BIGONY
*ADM. RICHARD BYRD
EDWARD P. CURTIS
*GEN. BENJAMIN FOULOIS
*ARTHUR GODFREY
*ARTHUR C. GOEBEL
*GEORGE HALDEMAN
*ERNEST C. HALL
*B. R. J. "FISH" HASSELL
*V. L. "CASEY" JONES
*OTTO P. KOHL
*JOHN H. LIVINGSTON
*HENRY T. "DICK" MERRILL
*JOHN P. MORRIS
HAROLD E. NEUMANN
*BLANCHE NOYES
*WILLIAM T. PIPER, SR.
ROGER DON RAE
C. R. SINCLAIR
*BURRILL TIBBS
*ROSCOE TURNER
*KARL E. VOELTER
*WALDO D. WATERMAN
MARION WEARTH
*ROGER Q. WILLIAMS
*CLARENCE YOUNG

1972

*WALTER H. BEECH
*WALTER R. BULLOCK
*ARTHUR J. DAVIS
*DOUGLAS H. DAVIS
*WILLIAM C. DIEHL
JAMES H. DOOLITTLE
*AMELIA EARHART
*JOHN J. FRISBIE
*RUSSELL F. HOLDERMAN
*GROVER LOENING
*A. B. McMULLEN
*GEORGE A. PAGE, JR.
*EDWARD V. RICKENBACKER
*WILLIAM B. ROBERTSON
*BASIL ROWE
*ELLIOTT WHITE SPRINGS
CHARLES I. STANTON
*STANLEY I. VAUGHN
*JAMES R. WEDELL
*CHARLES F. WILLARD
*LLOYD O. YOST

1973

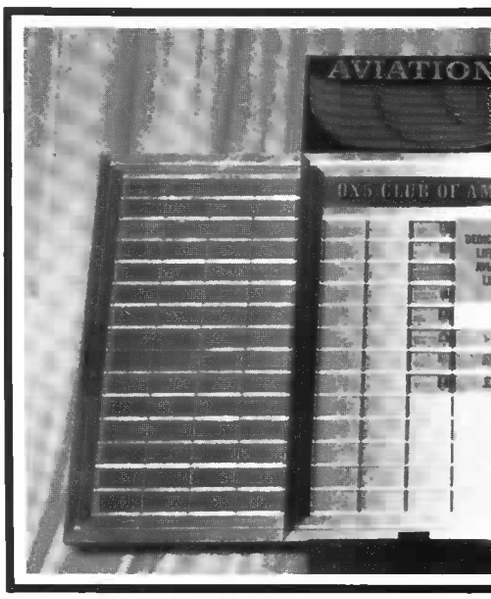
TALBERT "TED" ABRAMS
*ALEXANDER GRAHAM BELL
ANTHONY A. BITETTI
*CLYDE V. CESSNA
*HARRY D. COPLAND
*PARKER D. CRAMER
*DAN GRECCO
*BENNETT H. GRIFFIN
*CLIFFORD W. HENDERSON
*BEVERLY "BEVO" E. HOWARD
*HOWARD R. HUGHES
*EDWIN A. LINK
LESLIE C. MILLER
*MICHAEL C. "MIKE" MURPHY
*LEONARD J. POVEY
*LLOYD C. STEARMAN
*NOEL WIEN

1974

*EDWARD A. BELLANDE
*COL. CLARE W. BUNCH
*CLARENCE D. CHAMBERLIN
*ROBERT T. GRANT FOWLER
PAUL E. GARBER
*EDWARD B. HEATH
*CHARLES W. "SPEED" HOLMAN
*BEN O. HOWARD
*JOHN F. IRWIN
*EMIL MATTHEW LAIRD
TONY LEVIER
*ALLEN H. MEYERS
*CALBRAITH PERRY RODGERS
*LOUISE THADEN
SYLVESTER J. WITTMAN

1975

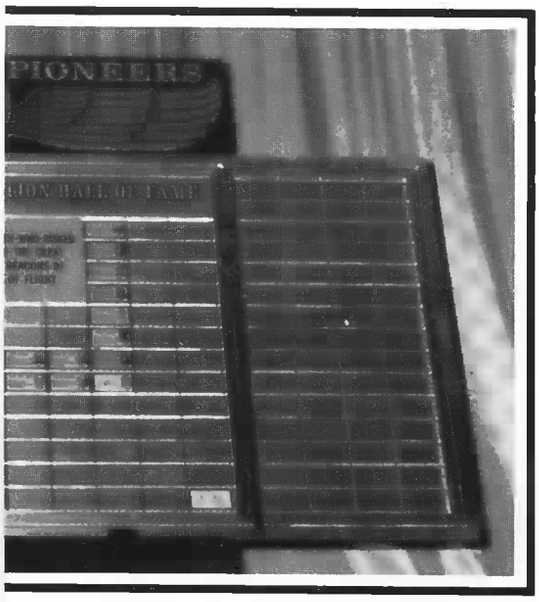
*THOMAS B. BOURNE
*VANCE BREESE
*CLAYTON J. BRUKNER
*WALTER J. CARR
*JOHN E. CROWELL
*SANFORD E. GREENWALD
GEORGE E. HADDAWAY
*GORDON ISRAEL
MARTIN JENSEN
GLENN E. MESSER
*WILLIAM A. ONG
*ROBERT C. REEVE
*T. CLAUDE RYAN
CLAYTON L. SCOTT
EDNA GARDNER WHYTE



PROCEDURE FOR SELECTING HALL OF FAM CANDIDATES

Selection for induction into the O Aviation Pioneers Hall of Fame is possi through a process of nomination fr within one of the OX5 Wing organi tions, or by being named as a nomi from outside an organized Wing. The ter would be possible if an appointee named by the National OX5 President represent his particular area for this p

PART OF THE FIRST GROUP OF OX5 HALL O E INDUCTEES 1971. L to R: Clifford Ba "Sinnie" Sinclair, Edward P. Curtiss, Ernie Hall, Noyes, B. R. J. "Fish" Hassell, Karl E. Voe



pose, where a formalized Wing organization is non-existent. Organized Wings have allocated to them Hall of Fame nominating authority to the extent of one nominee for each one hundred paid-up members. The Wing organizations select their own nominees, by whatever method they determine most appropriate. Using forms furnished them for this purpose, they forward their nominees to the named Chairman of a Screening Committee appointed for this purpose.

1976

*GEORGE "TINY" BROADWICK
WILLIAM H. CONRAD
*FRANK MAYO FAIRCHILD
HERBERT O. FISHER
*GLEN A. GILBERT
*CHARLES W. KERWOOD
*THOMAS H. KINKADE
*JAMES L. KINNEY
*CHRIS LAMPLE
*CHARLES A. LINDBERGH
*FRED E. MACHESNEY
*DEXTER CHARLES MARTIN
*GLENN L. MARTIN
*GEORGE C. POMEROY
LLOYD C. SANTMYER
*EDWARD A. STINSON
*WILBUR WRIGHT
*ORVILLE WRIGHT

1977

*HARRY A. BRUNO
*ERNEST E. DRYER
*JACK FRYE
JOSEPH B. HARTRANFT, JR.
*WILLIAM A. KENNEDY
*NICK B. MAMER
*R. C. "TEX" MARSHALL
AL MOONEY
*WILL D. "BILLY" PARKER
*JOHN G. "TEX" RANKIN
*WILLIAM M. ROBERTSON
*J. EARL SCHAEFER
*MERLE K. SMITH
*WILLIAM B. STOUT
*RAYMOND M. WILSON

1978

WALTER J. ADDEMS
W. BURIL BARCLAY
*GIUSEPPE BELLANCA
ELREY B. JEPPESEN
*WILLIAM P. LEAR
A. ELLIOTT MERRILL
*ARTHUR NUTT
*JACK R. PECK
PAUL H. POBEREZNY
KIMBALL J. SCRIBNER
*NOAH D. SHOWALTER
ALBERT A. VOLLMECKE
DWANE L. WALLACE

1979

*RUTH ROWLAND NICHOLS
JOHN KNUDSEN NORTHROP
*CLYDE E. PANGBORN
LEOPOLDO LOPEZ TALAMANTES
C. G. TAYLOR
*ALFORD J. WILLIAMS, JR.
LEIGHTON H. COLLINS
*DONALD W. DOUGLAS
VIOLA GENTRY
*FRANK M. HAWKS
*CHARLES B. KIRKHAM
*RALPH A. O'NEILL
*JOHN C. SEAL
DOROTHY HESTER STENZEL

1981

FRED L. AUSTIN
*VERN C. GORST
O. R. HAUETER
A. L. JOHNSON
*DR. THEODORE VON KARMAN
RAYMOND I. PETERSEN
*WILEY HARDEMAN POST
C. R. SMITH
ELINOR SMITH
*HOWARD VERNON WOODALL

1982

*L. MORTON BACH
ELDON W. CESSNA
*JOE E. CROSSON
THOMAS H. DAVIS
OLE FAHLIN
*ZANTFORD D. GRANVILLE
HAROLD D. HOEKSTRA
CLYDE W. ICE
JACK B. JAYNES
JEROME F. LEDERER
JOHN C. RAY
P. H. SPENCER

1983

*FRANCES L. BARR
*DONALD C. BEATTY
*WILLIAM H. BOWLUS
KAY A. BRICK
JACK R. CRAM
*RAY PAUL HYLAN
HENRY H. OGDEN
CLARENCE E. PAGE
REGINALD L. ROBBINS
*ANTHONY STADLMAN
JEROME E. WOOD
FORREST E. WYSONG

1984

REX ANGER
*MAXWELL W. BALFOUR
WALTER R. BALLARD
JOHN P. BECKER
*MILO BURCHAM
HOWARD LEE
COL. JAMES J. MATTERN
CLOYCE J. TIPPETT
BOBBI TROUT
REGINALD SINCLAIRE
EVELYN WALDREN

...Beard, Bernt Balche... George Haldeman, Marion Wearth, Otto Kohl, Harold Neumann, and John P. Morris. Roger Don Rae. Ha...eondsport, N.Y.

Left: Eleanor Smith — holder of two world records for women in solo endurance — 13½ hrs., Jan. 1929 — 26½ hrs., April 1929. Refueling endurance 42½ hrs. with Bobbi Trout, Nov. 1929.

Top Left: Doris Langler — Participated in 18 powder puff derbys and has worked many years as a flight simulator. Logged 11,500 hrs. of flight time, held airline transport certificate with commercial privileges.

Top Right: Evelyn Waldren — Barnstormer aerobatic pilot and instructor. Established record solo non-stop, Vancouver, B.C. to Tijuana, Mexico, 1941.

Above:

First Birdwoman to Parachute

ISS PEARL WHITE, 21, WAVING OFF A PLANE FOR HER FIRST 1,500-FOOT 'CHUTE JU

Miss White over Richmond, Va., as she started 100,000 Junior Birdmen and Junior Birdwo

This is a group picture of some of the contestants in the first Powder Puff Derby taken August 19th, 1929, after landing at San Bernadino, Calif., the first overnig stop in the race from Santa Monica, Calif., to the National Air Races at Cleveland, Ohio.
Front Row, Left to Right: Vera Dawn Walker, Louise Thaden, winner of race "The first woman's transcontinental race in the history of aviation" Chubby Keit Miller, Ruth Elder and Edith Foltz. From Left in Back: Thea Rasche, Margaret Manzer and Neva Parris.
There were eleven other contestants not shown on this picture, including Amelia Earhart.

Photo Above, L. to R.: Tiny Broadwick, Glenn L. Martin and ?.

Photo at Right: Tiny Broadwick, first person to try a free fall from a plane, 1913, under observation of the U.S. Army Signal Corps. Pilot was Glenn Martin.

This photo was taken at the Annette Gibson Pylon Air Race. The Race was sponsored by the I. J. Fox Furrier of New York, on Roosevelt Field, Long Island in 1933. Winner of the race was Edna Gardner Whyte.
Standing: #1 Amelia Earhart — #2 Johana Buzzy — #6 Edna Gardner Whyte — #9 Teddy Kenyon — #10 Edith Descomb, #11 Ruth Nichols, #12 — Mrs. I. J. Fox.
Kneeling: #1 Helen Richey — #4 Arline Davis — #5 Annette Gibson.

Alhambra Airport, 1932
Reception honoring Amelia Earhart
L to R: Florence Lowe "Pancho" Barnes
Mrs. Ulysses Grant McQueen (of the Women's International Aeronautic Assoc).
Amelia Earhart — president of the 99's
Clema Granger
Elizabeth Lowood
Gladys O'Donnell
Unknown, but one of the bunch (99 also)
Mildred Morgan
Elliotte Roberts. (all were 99's excepting Mrs. McQueen and Pancho, Clema, Elizabeth, Gladys are OX5's.)

In cockpit of the Gypsy Moth is Lady Heath, the famous British Aviatrix, at Emporia City Airport, KS, June 1928. Standing, L. to R.: Lee Pointer, Owner and President of Emporia School of Aeronautics, and Don Ballew, Chief Pilot. Don escorted Lady Heath into their field from Kansas City, MO. He was flying a Kinner powered Eaglerock.

Bobbi Trout — Established world solo endurance record for women. First woman to fly all night woman's altitude refueling endurance record — 1929 — with Eleanor Smith.

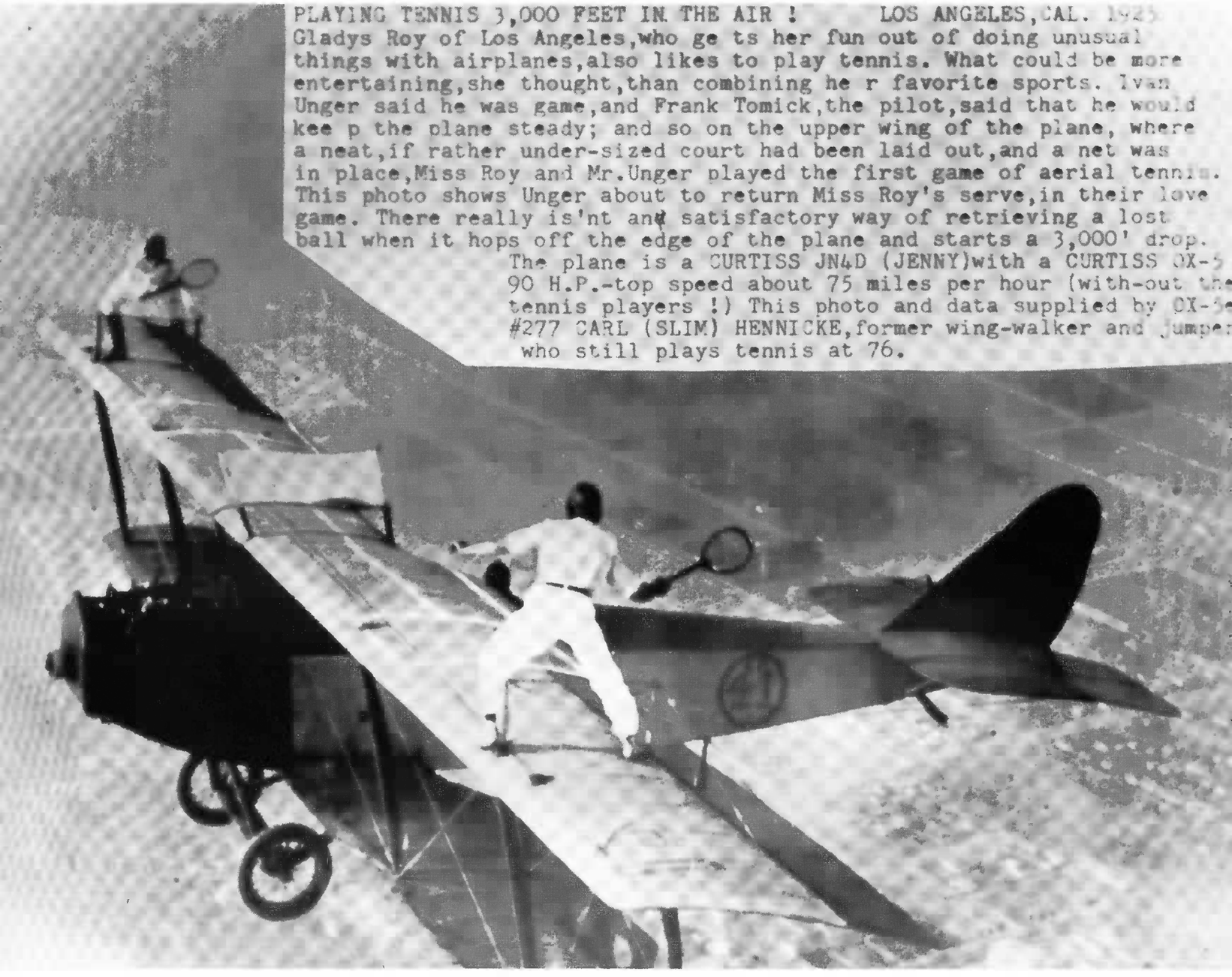
Lillian Boyer Werner — Outstanding aerial sensationalist, performing in 41 different states and Canada with highlights as — 143 auto to plane changes — 50 parachute jumps (13 into Lake Ontario) — 250 air shows plus 97 free exhibitions — 15 plane to plane changes.

The aircraft is an Otto Timm production with a 90-hp OX2 formerly belonging to Ruth Law. It was supposed to represent a Curtiss pusher of 1910 vintage. The aviatrix is Amelia Earhart, then little known beyond the airfields of Los Angeles. (Archie Dunning, photographer)

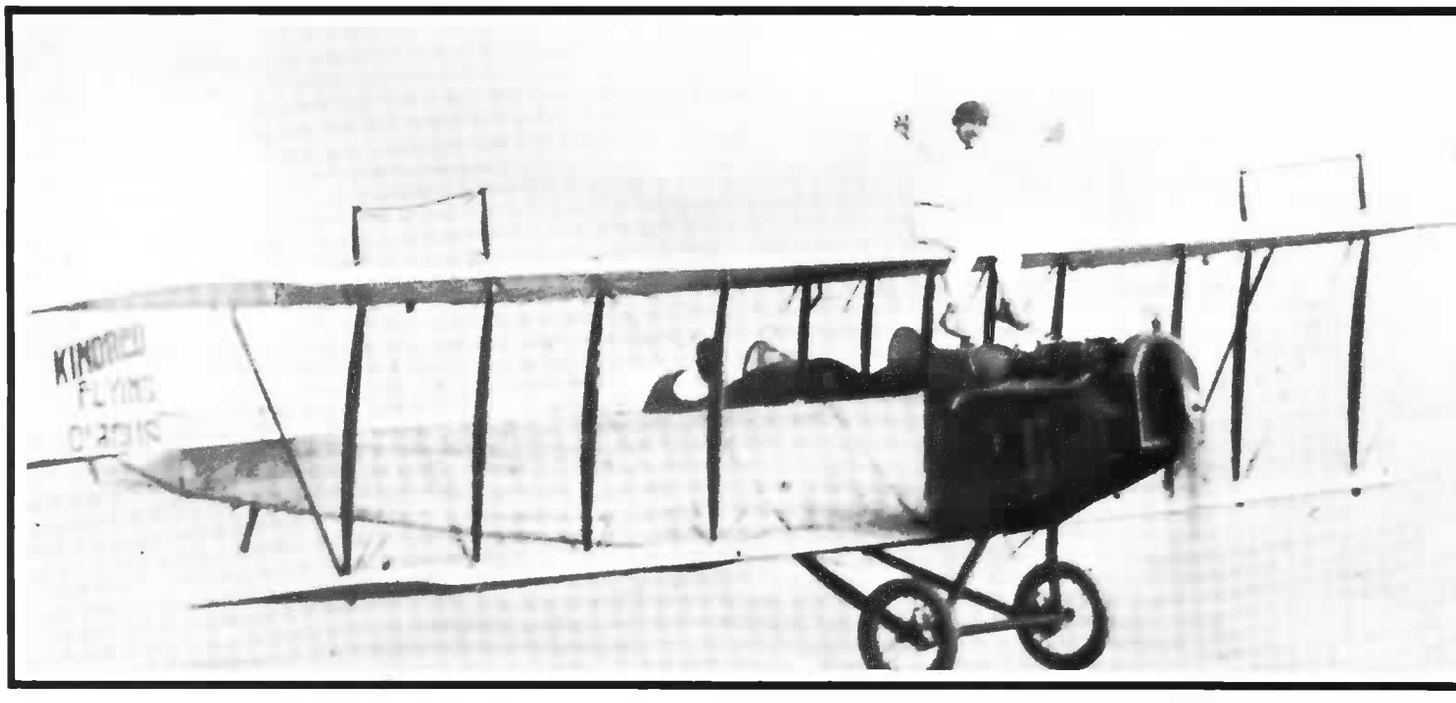
Louise Thaden, famous racing pilot, who with Blanche Noyes won the Bendix Trophy in 1936, New York to Los Angeles, beating out several male pilots. Also set an endurance record with Frances Marsalis — staying aloft 8 days in Aug. 1932.

?, ?, Gladys O'Donnell, Thea Rache, Phoebe Omilie, Louise Thaden, Amelia Earhart, ?, Ruth Elder (?), Vera Dawn Walker (?).

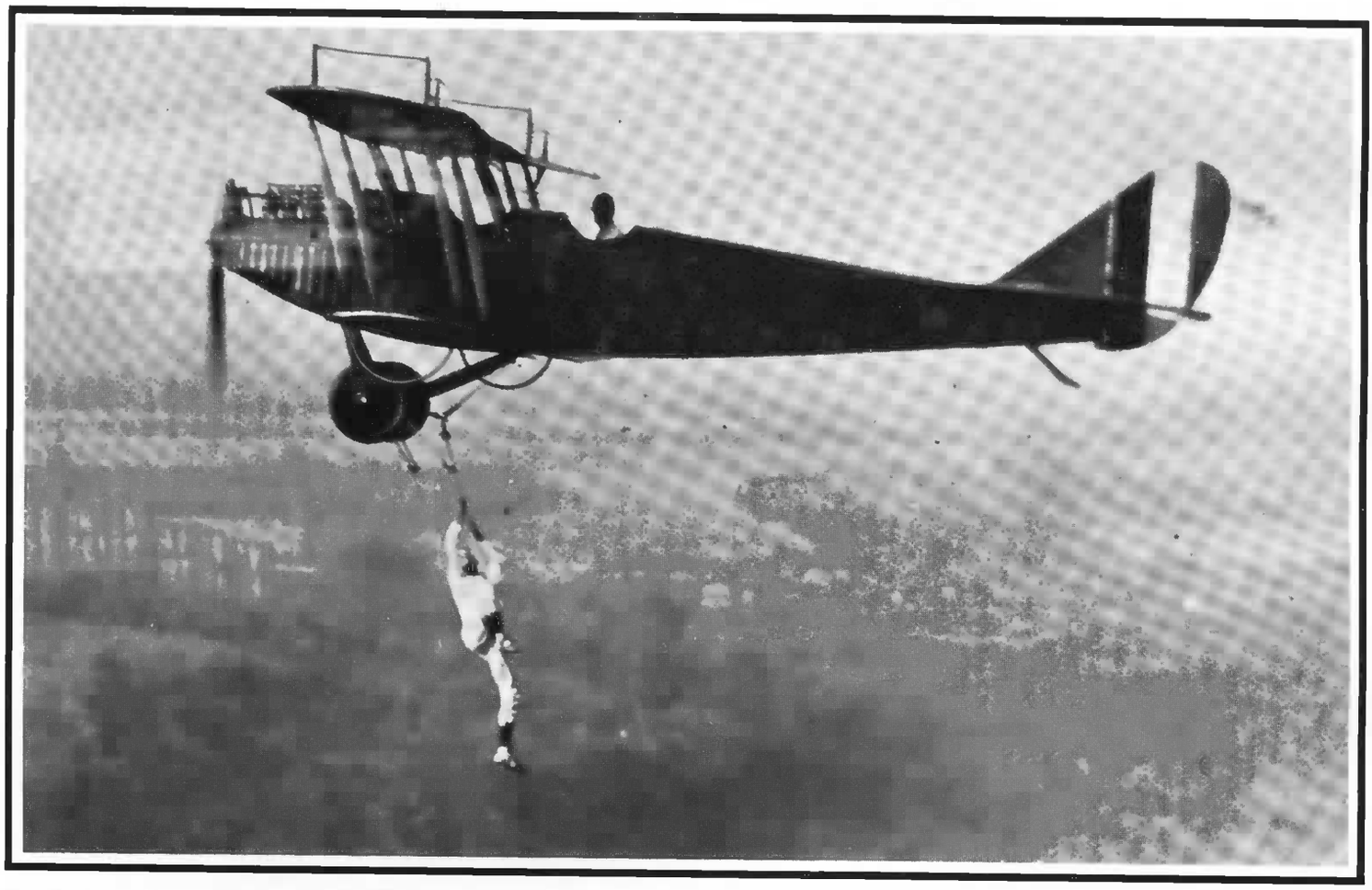
Ruth Law, famous aviatrix flew on Staten Island at the Oakwood meet 1912. She was the 4th woman to receive a pilots license.



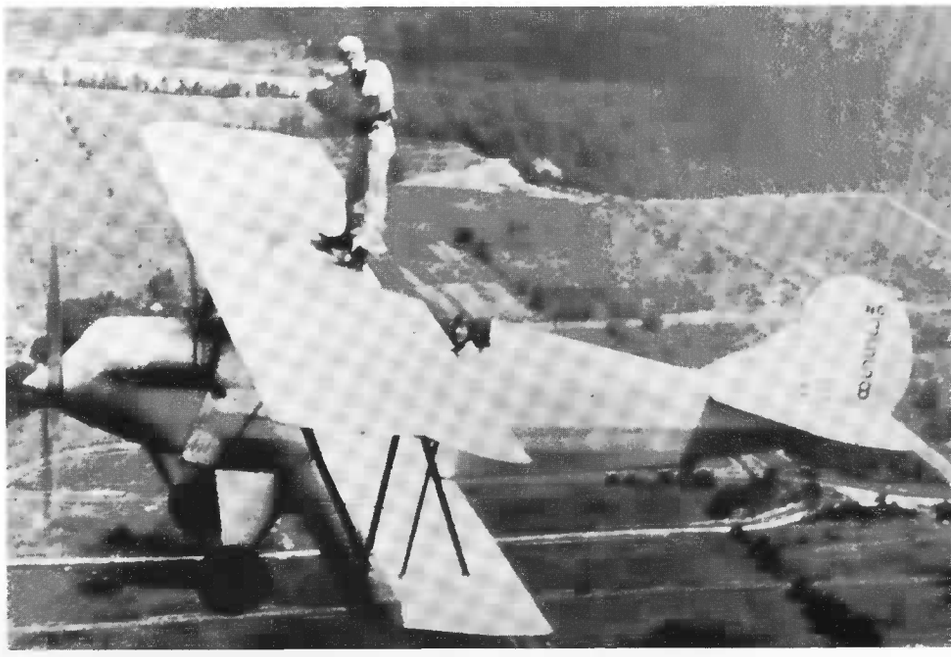
PLAYING TENNIS 3,000 FEET IN THE AIR ! LOS ANGELES,CAL. 1925
Gladys Roy of Los Angeles,who ge ts her fun out of doing unusual things with airplanes,also likes to play tennis. What could be more entertaining,she thought,than combining he r favorite sports. Ivan Unger said he was game,and Frank Tomick,the pilot,said that he would kee p the plane steady; and so on the upper wing of the plane, where a neat,if rather under-sized court had been laid out,and a net was in place,Miss Roy and Mr.Unger played the first game of aerial tennis. This photo shows Unger about to return Miss Roy's serve,in their love game. There really is'nt any satisfactory way of retrieving a lost ball when it hops off the edge of the plane and starts a 3,000' drop.
The plane is a CURTISS JN4D (JENNY)with a CURTISS OX-5 90 H.P.-top speed about 75 miles per hour (with-out the tennis players !) This photo and data supplied by OX-5 #277 CARL (SLIM) HENNICKE,former wing-walker and jumper who still plays tennis at 76.



Stunt Flyers and the OX5



Tex Rankin, Aerobatic Ace

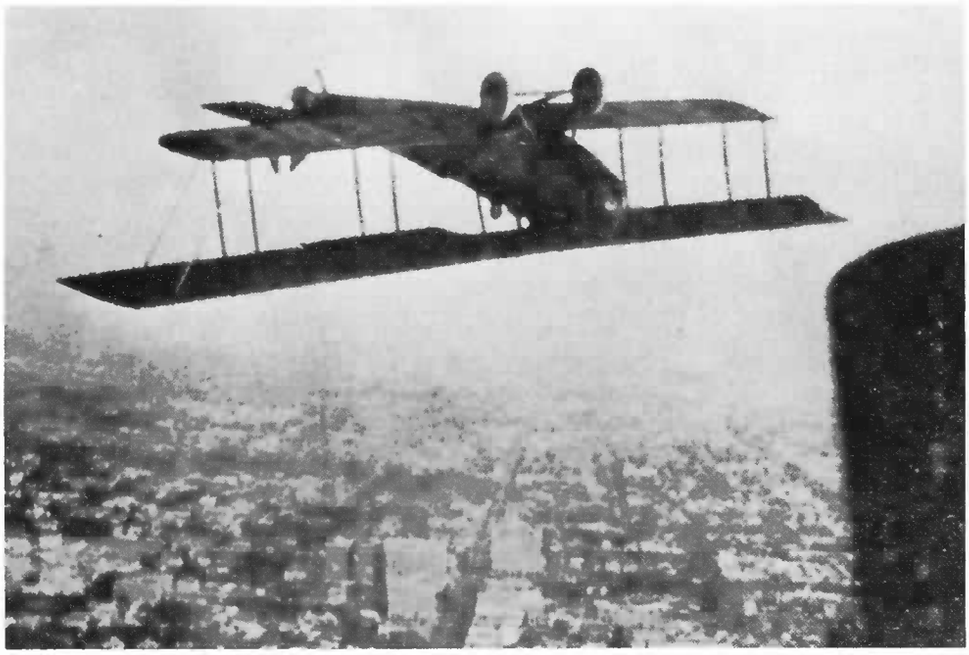


On wing Frank Kevetco, Homestead, FL Pilot, late Edgar Standring. Photo owned by past Ohio Preside
Arlo Mather, Avon, Ohio. The airplane, an OX5 Travel Air of course. Everything went all right until they d
a tight bank and Frank's knees buckled. He fell into the front cockpit. (Air Races, Cleveland).

Jim Nissen flying the Jenny — Al Silver sky-diver, 2005th jump for OX5 Air Show at Meadowlark Field, Livermore, California.

Cliff Henderson of Palm Desert, CA well known for conceiving and managing the National Air Races
Cleveland, 1928 thru 1939. He founded and was first manager of the Los Angeles Airport; creator of the B
dix and Thompson Trophies, and the Women's Powder Puff Derby.

George C. Dade, age 16, first solo student of
Roosevelt Aviation School.



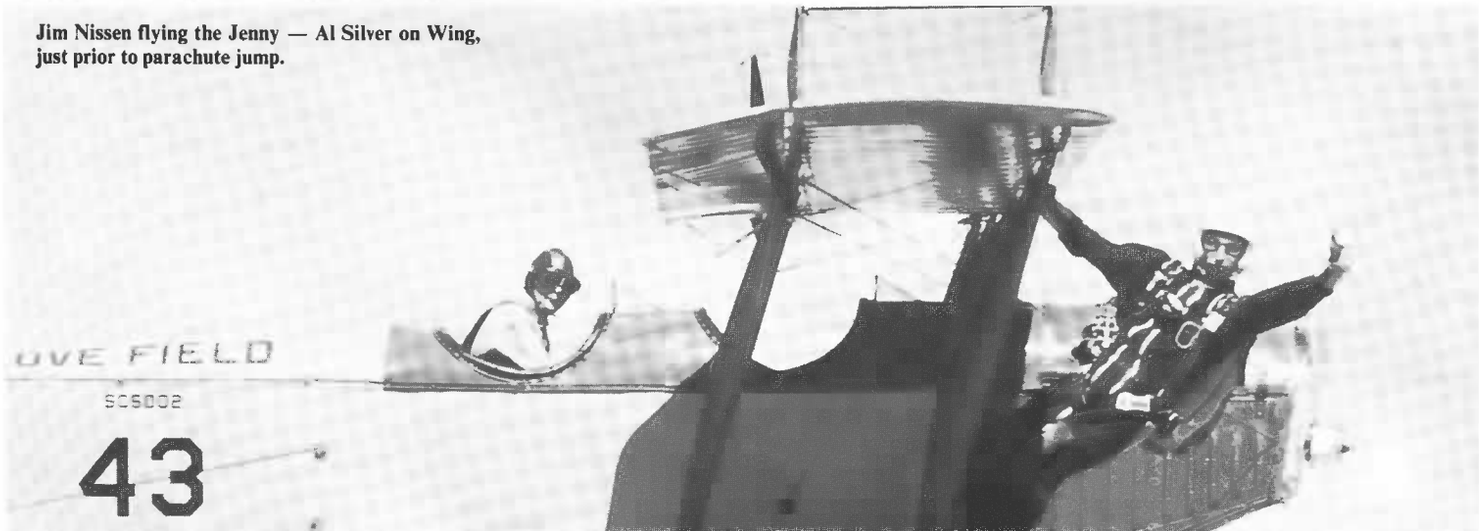
Art Goebel of Los Angeles, flying upside-down. This pilot has broken a number of records for upside-down flight. Looking down on Hollywood Boulevard, Hollywood, California in 1924.

Mr. and Mrs. Dewey Noyes (Blanche)

Leonard J. Povey, former head of the Cuban Air Force. In 1934, after an impromptu air show in Miami, he was approached by Col. Fulgencio Batista about going to Cuba to inspect facilities and train pilots. Povey was the head of the Cuban Air Force from 1934 to 36. Povey taught himself much about flying, but his official introduction came in 1922 when he enlisted in the Army Air Service and became one of the first enlisted pilots. The Cuban Eight maneuver, now a standard in air shows, was originated by Povey at the 1937 Miami Air show where Jimmy Doolittle was the judge.

Art Goebel (1914) and his home built short coupled Indian racer (twin), equipped with Savannah high lift racing cams. Goebel won many Div. and track races.

Jim Nissen flying the Jenny — Al Silver on Wing, just prior to parachute jump.



Dayton Flying Club, 1926, plane is a Jenny. L to R: Rigney (pilot), Scotty Tres; Graham (made Red Bar Batteries — flying member); Steck — (mechanic — flyi
member); Schaffer (flying member).

Tony Strom advertising for Swift Meat Co. around country — 1922-23.