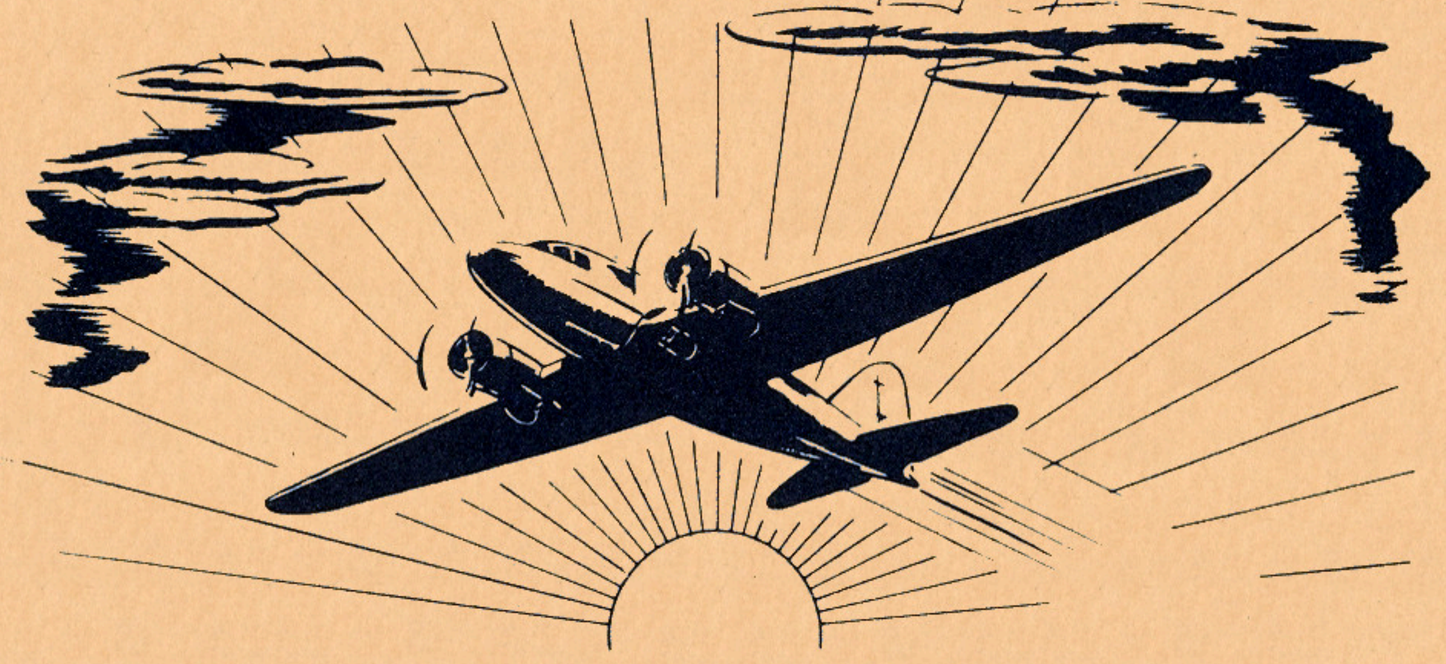
TYDOL FLYING A

STAMP ALBUM

OF

AMERICAN AVIATION



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AMERICA ALOFT

Compiled and edited by

STANLEY WASHBURN, Jr.

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Illustrated with 48 poster stamps

created by Edward A. Wilson

Titusville, Pennsylvania, August 1859 . . . Colonel E. L. Drake approaches a crazy pyramid of timbers . . . A pump is started . . . Drake is wild with excitement as a rich golden green liquid flows from the pump . . . For the first time, man has drawn crude petroleum from the earth!

Kitty Hawk, North Carolina, December 1903 . . . Orville Wright opens the throttle of a 12-horsepower gasoline engine attached to a biplane . . . Two crude propellers whirr at full speed . . . The machine lurches forward, rises, and stays aloft for 12 seconds . . . For the first time, man has flown a powered airplane!

These two events, seemingly unrelated, are indelibly linked together as two of the most important milestones in world history . . . They gave to America *both* the honor of *first* bringing petroleum from the bowels of the earth . . . and the honor of *first* harnessing petroleum so man could fly above the earth.

Little did Colonel Drake dream that the crude petroleum he discovered would revolutionize transportation and create an industry that each year builds millions of motor cars . . . Even the Wright Brothers could not have foreseen that through the power of petroleum America would develop giant airplanes that span the continent in a few short hours . . . that carry as many passengers as a railroad car . . . that keep America first in the field of aviation.

In presenting to you this dramatic story of American Aviation, its sponsors take pardonable pride in the part they have played in the progress of the petroleum industry. The first crude oil pipe line from the original Pennsylvania fields to the sea coast was built by the pioneers who founded Tide Water Associated Oil Company. That same pipe line still carries the "liquid gold" that is refined into Veedol . . . the motor oil used by millions of motorists here and abroad.

Tide Water has served the American public with quality petroleum products for over 60 years . . . grease for wagon wheels . . . paraffin for candles . . . lubrication for industry . . . power for planes . . . And when new petroleum needs arise, Tide Water will be ready and waiting . . . with the product to meet the problem.

THE PIONEERS

WHEN man attempts what no one else has done before, he is considered by his fellows to be either fool or genius. For centuries, men who dreamed of human flight were ridiculed; their experiments hindered by mocking crowds. Even the wind, with its sudden gusts and fickle changes, seemed to plot against those who dared to fly.

But in every field of endeavor, the burdens of progress are borne by a few creative spirits enduring endless labor to bring accomplishment from the indifference of nature and the indolence of man. No pioneers in history deserve greater credit than those honored men who taught the world to fly: da Vinci, Lilienthal, Langley, the Wrights, and the host of others who risked lives and fortunes to solve the problems of human flight.

When we sit in the reclining chair of a Flagship speeding at three miles a minute, flying seems simple enough. But just think, not so long ago, when Bleriot hopped 25 miles across the English Channel, the Frenchman probably took by far a greater chance than do trans-Atlantic flyers of today. Likewise when Wilbur Wright demonstrated his first plane to the Army by flying around a parade ground, the great pioneer was probably taking a greater risk than a modern pilot who streaks earthward at 600 m.p.h., test-diving the newest all-metal fighter.

Throughout the experimental years of aviation, certain men and machines are outstanding in their influence on later development. Ten of these pioneer types are described and illustrated in this book, where we see the evolution from piano wire, bamboo and fabric, to rivets, stainless steel and dural. But we must not overlook the hundreds of unmentioned pioneers whose experiments carried forward the art of flight throughout the decades.

Da Vinci introduced the idea of mechanical flight in the sixteenth Century. Two centuries later—the Montgolfier Brothers sent a hot-air balloon aloft

over Paris, an experiment resulting in the first successful flight of man-carrying balloons. From that day until the beginning of the 20th Century, lighter-than-air craft continued to hold first place in the conquest of the air.

In England during the first decade of the 19th Century, Sir George Cayley experimented with heavier-than-air machines. Many inventors, both French and English, followed his example; but no great success was achieved with airplanes until 1896 when the American scientist, Dr. Samuel P. Langley, built a power-driven model which flew nearly a mile—the first time in history a motor-driven plane accomplished sustained flight! Six years later in the U. S., the first man-carrying, powered airplane took off and flew, bringing the laurels for the solution of a problem centuries old to those immortal American pioneers of flight, Wilbur and Orville Wright.

"There shall be wings. If the accomplishment be not for me, 'tis for others," so said the master Italian scientist, painter of the famous picture "The Last Supper." His notebooks prove that over 400 years ago Leonardo da Vinci sketched detailed drawings of wing structures, parachutes, and flying machines. Against Leonardo's orders, a shop assistant attempted to fly an experimental ship, resulting in probably the first fatal aircraft accident in the history of aviation.

The German scientist, Otto Lilienthal, in 1892 developed the first really successful gliders, controlling his craft by body movements. He made over 2,000 flights, but fatally crashed the day before he planned to fly his first powered glider. The Wright Brothers carefully studied Lilienthal's experiments and applied the German's experiments to the construction and flying of their own gliders, which they built and flew for 2 years before attempting to fly a power-driven airplane.

THE PIONEERS

Four years before the Wright Brothers began their gliding experiments, Dr. Samuel P. Langley, American scientist, built a steam-driven airplane model which successfully flew nearly a mile. Seven years later, the U. S. Army appropriated Langley $50,000 to develop a man-carrying machine. Faulty launching gear wrecked this "Aerodrome" on its only two test flights, conducted from a houseboat on the Potomac River. Langley's research proved invaluable to later builders.

Santos-Dumont, wealthy young Brazilian coffee planter, developed the first practical controlled lighter-than-air ship. The envelopes or bags of his small hydrogen-filled airships were made of varnished silk. They were propelled by a 3½ h.p. air-cooled tricycle engine converted to drive a crude propeller. Dumont thrilled Paris for years by his spectacular low altitude flights up and down the gay boulevards in his baby airships, circling the Eiffel Tower and mooring to balconies.

A gusty 27-mile wind sifted over the sand dunes at Kitty Hawk, N. C. on that cold December morning. Orville Wright, lying prone in the biplane, carefully opened the throttle of the 12-h.p. gasoline engine. With the two crude propellers whirring full-speed, he tripped the releasing gear. The machine lurched forward along the launching rail, lifted clear, soared for 12 seconds. An epic of aviation history was made that day—the honor of powered airplane flight went to America.

As dawn was breaking near Calais, France, over thirty years ago, a middle-aged Frenchman limped toward the pasture airport behind his frail monoplane. Bleriot, badly injured from a recent accident, shouted above the clatter of his little engine, "If I cannot walk, I'll show the world I can fly!" So saying, he took off and crossed the English Channel—25 miles in 30 minutes—a feat which caused a world-wide sensation and inspired more men to learn to fly.

TYDOL FLYING A STAMPS OF AMERICAN AVIATION

Eugene Ely first demonstrated the practicability of naval aircraft by flying his Curtiss biplane from shore to a small platform on the deck of the cruiser "Pennsylvania." The arresting gear improvised to stop the plane, once it landed on the platform, consisted of a row of sandbags connected by ropes athwartship which were picked up by a drag hook attached to the airplane. After his successful landing before high-ranking Naval obervers, Ely took off and flew back to shore.

In the early twenties commercial aviation was born in America—thanks to the gypsy flyers, the war-trained Army pilots who were making a living barnstorming in their Jennies, the famous war-time Curtiss training planes. These hardy pilots, flying their under-powered biplanes from cow-pastures, sold aviation to the American public—gave thousands of people their first airplane ride, thus stimulating the growth of American aviation industry and the scheduled airlines.

During the last months of the World War, the Navy Department ordered the construction of flying boats capable of crossing the Atlantic. Although the Armistice was signed before the ships were completed, a pioneering flight was attempted. In May, three NC-type 4-engine flying boats took off from New York. Only the NC-4, commanded by Lt. Commander Albert Read, completed the entire trip, via Trespassey Bay, N. F., the Azores, and Lisbon to Plymouth.

The Ford Motor Company was still turning out its famous Model "T" car when the vision and progressiveness of this great organization gave air travel one of its greatest boosts—the production of the first commercially practical, all-metal airliner. The corrugated-metal Ford trimotors, designed by William Stout, were nicknamed "Tin Geese" and used on the early transcontinental air-rail routes. They cruised at about 105 miles per hour, and flew only by day.

TRAIL BLAZERS OF THE AIR

SINCE the dawn of history, certain restless men of daring and vision have ventured forth into the unknown to win or die—pioneering paths others later followed. These are the heroes who keep aflame the spirit of adventure, stimulate progress and sway the hide-bound thought of a public ever slow to accept the new.

When such trail blazers of the air as an Earhart, Post, or Hughes taxi toward police lines at the end of a record-breaking flight, the layman never suspects the incredible ordeal masked by a light-hearted smile and tired wave of the arm. "Had a lot of fog," or "Ran into bad ice a couple of times," are typical laconic comments of these great fliers, concerning their spectacular long-distance hops. These pilots, however, can rarely express what such flights do to their minds and bodies—what sensations they experience during those interminable hours when every minute defies catastrophy; the sting of weary bloodshot eyes fixed on flickering instruments; the numb, leaden feeling of muscles cramped by hours in the cockpit; the monotonous droning engine roar boring into every fiber; the irritating prickle of static in radio headphones; the desperate fight against sleep alone in a dark, cell-like cabin of an airplane hurtling through space over an ocean or wilderness hundreds of miles from land or airport; the sudden pound of the heart and clammy perspiration which follow the miss of the cylinders when a fuel tank runs dry, or when the oil pressure wavers; the brutal bone-jarring bumps of thunderstorms. After the flight, such little details—indelibly seared into a pilot's memory during those flying hours of destiny—are seldom mentioned unless in conversation with another pilot who understands.

The next time you take a long automobile trip, imagine that you can't leave the wheel. You have no one to talk to. You can't rest or stretch at the next filling station. Your only refreshment is a quick swallow from a

thermos bottle—a bite from a sandwich. Hour after hour you must drive on without stopping. All day. All night. Half the next day. For 33 hours—the time it took Lindbergh to fly from New York to Paris. Imagine continuing such a grind for 7 days, with only the briefest snatches of food and sleep, as Wiley Post did when he circled the globe! Then you will have some small idea why the trail blazers of the air are great people—why the honor due these pioneer fliers will never wane in a rising tide of the commonplace which is overtaking our modern life.

Inspiring examples of history-making flights are described in this book. In the future, other aviators will fly these same paths—but never again will anyone fly them for the first time.

In the spring of 1924, the U. S. Army authorized a flight to circumnavigate the world by airplane. Eight air corps officers flying 4 single-motored, Liberty-powered Douglas biplanes left Seattle, Washington, and headed westward. Changing from wheels to pontoons, they battled unaccountable odds across Japan, China, India, Arabia, the Balkans, across Europe, and the Atlantic via Iceland and Greenland. Two of the original ships and four pilots completed the entire trip.

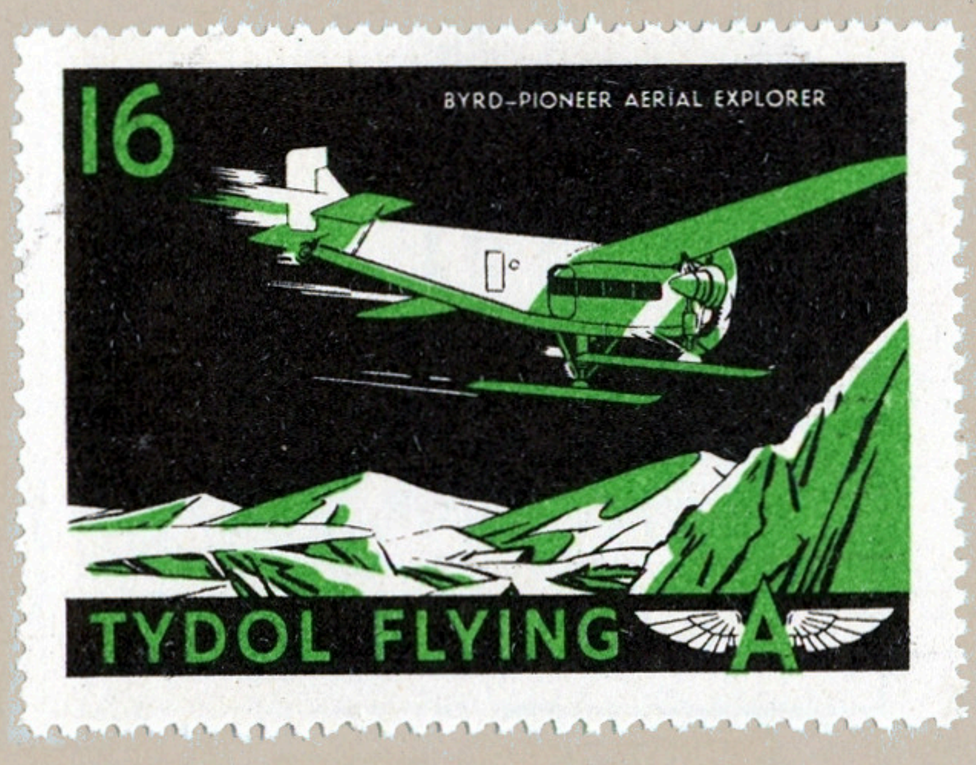
With five years of flying experience as a barnstormer with the Army air corps, and later as a night mail pilot, Lindbergh secured the backing of St. Louis businessmen to outfit a special Ryan monoplane for an ocean solo flight. He flew "The Spirit of St. Louis," powered with a 200-h.p. Wright Whirlwind engine, from Roosevelt Field to Paris, 3600 miles in 33½ hours—a flight which inspired the world, and provided the stimulus for an epoch-making boom in U. S. Aviation.

TRAIL BLAZERS OF THE AIR

No aircraft in history holds a more distinguished record than the German airship "Graf Zeppelin." When new, in 1929, the "Graf" made a spectacular round-the-world flight commanded by Dr. Hugo Eckener from Lakehurst, N. J., to Friedrichshafen, Tokio, Los Angeles back to Lakehurst—in 21 days, 5 hours and 54 minutes. Since then the airship has made more than 41 crossings of the South Atlantic, carrying mail, passengers, and freight.

Capt. Charles Kingsford-Smith, a plucky Australian with a crew of three, took off from San Francisco on a May morning in 1928 for Australia, via Honolulu and the Fiji Islands. Their Fokker tri-motored monoplane, "The Southern Cross," was often forced low by pelting tropical rains and wind, but they reached Brisbane in 8 days, covering 7,300 miles. Smith and his crew had made the longest all-water hop by air. Smith and his gallant crew were lost during a later trans-ocean flight.

Amelia Earhart might rightfully be called the "First Lady of the Air." Her place in aviation history is assured because of the tremendous impression her exploits made on the public's attitude toward flying. Before she was tragically lost in the South Pacific during an attempted globe circling flight, Miss Earhart flew the Atlantic alone, set a speed record from Mexico City to New York, and flew solo from Hawaii to California, in her single-engine land plane.



On Thanksgiving Day, 1929, in spite of 70°-below-zero cold, Commander Richard E. Byrd and a crew of three took off from "Little America" on the Bay of Wales for a 1600-mile round-trip dash to the South Pole. Flying their Ford tri-motor between icy canyons and over a mile-high glacial plateau, they successfully reached the Pole. The expedition photographed thousands of miles of uncharted wastes, thereby strengthening the U. S. claims to Antarctica.

TYDOL FLYING A STAMPS OF AMERICAN AVIATION

Most amazing flight in aviation history is Wiley Post's round-the-world solo trip. In his single-engine Lockheed monoplane, "Winnie Mae," this Oklahoma Indian, ex-farm boy, garage mechanic, and parachute jumper, handicapped by the loss of one eye, flew 15,596 miles from New York to Berlin, across Siberia to Alaska, across the U. S., back to New York in 7 days and 18 hours. In spite of horrible weather conditions, Post navigated with miraculous precision.

At night, in the Black Hills of South Dakota, a corps of specially trained men unfolded an acre of rubberized fabric. Helium gas hissed through pipe lines. Toward sunrise the "Explorer II," a mammoth orange colored balloon, higher than a 20-story office building, rose majestically into the still November morning. By noon the three scientists in their airtight gondola observed the purple darkness of the stratosphere, thirteen miles above the earth!

Howard Hughes established himself as an outstanding scientist by his world flight, With infinite care he equipped his plane with the latest aids to flight. With a radio engineer, engine expert, navigator and relief pilot, Hughes took off from New York for Paris on the first leg of the 15,000 mile dash. Cruising their Lockheed plane at an average speed of 208 miles per hour, the fliers girdled the globe in the record time of 3 days, 19 hours and 17 minutes.

To convince the public that lightplanes are practical for long distance travel, Johnny Jones, now an American Airlines First Officer, undertook a Los Angeles-New York non-stop hop in a 50-hp Aeronca. To avoid mountains, Jones followed the American Airlines' Southern Transcontinental route via Tucson, Dallas and Nashville. Jones landed at Roosevelt Field after flying the 2,785 miles averaging 91 m.p.h. The gas and oil used for this trip cost $30.91.

UNCLE SAM'S AIR SERVICE

THE scepter of foreign air power looms ominously when we read of the awe-inspiring numbers of deadly-swift European warplanes and the hosts of military pilots ready to fly them. But quietly and without much public notice, Uncle Sam's air services have been built up to become the most efficient, and, if need should arise, the most deadly fighting arm of any air service in the world.

In actual combat on foreign fronts, U. S.-built warplanes have demonstrated their superiority. Our bombers have more range; our fighters better performance; our engines greater reliability than foreign machines, mass-produced under stress of war. But more important even than the airplanes are the men who fly them, and U. S. military pilots have no peers.

Under government pressure, foreign aircraft factories claim an ability to turn out 2500 military airplanes per month, 30,000 per year—a remarkable production job, if true. But consider the problem of training pilots to fly these planes efficiently at an equal rate of production! Man is not a machine. Regardless of the pressure applied, a person cannot be taught to take shorthand or operate a typewriter expertly in a single day, week or even a month. Nor can people learn such activities as playing golf, reading music or swimming, without weeks, months or even years of practice. Military flying, with its necessity for split-second radio communication, aerial navigation, gunnery technique and thorough knowledge of tactics is vastly more difficult to learn than typewriting or an outdoor sport.

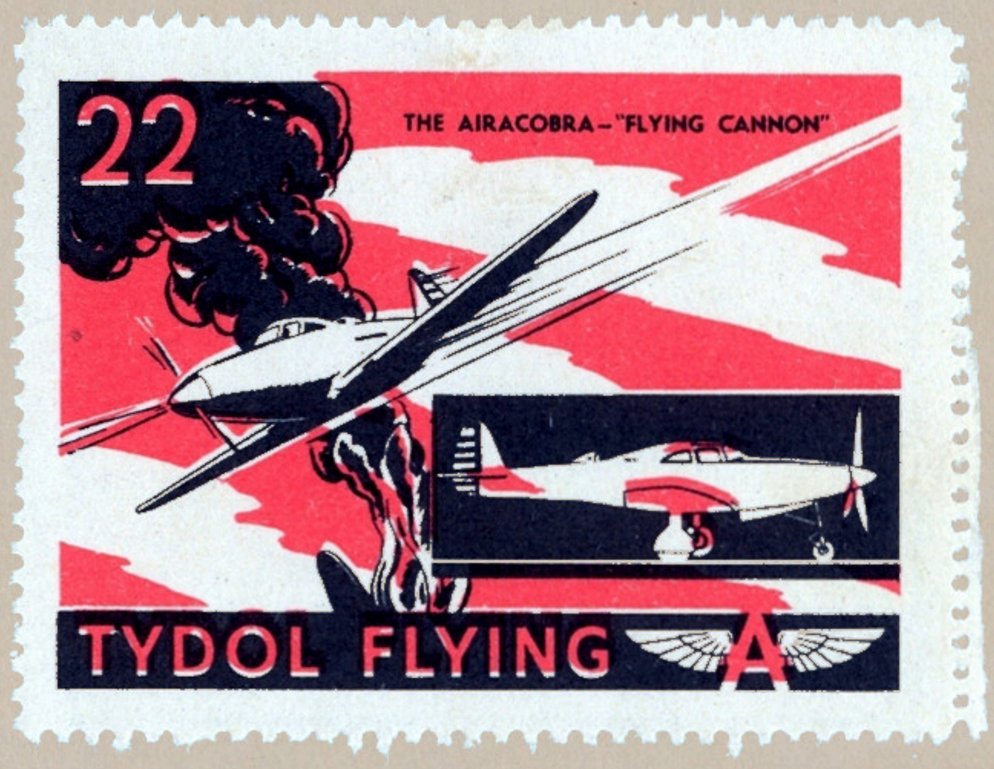
Our Navy, Marine and Coast Guard aviators are picked college graduates, each man receiving a year's intensive training at the Navy's famous Pensacola, Florida, flying school before being assigned to duty with the Fleet or ashore. Even with this superior background of education and flight training, our Naval aviators are not considered useful for military missions until they have had at least a year or

more of active duty with the Navy's operating squadrons. In spite of the fact that every effort is being made to increase its flying personnel, the Navy has never yet been able to push more than 600 pilots through its training course in a single year. Incredible as it seems, hardly enough young men can be found who are qualified to start the course.

Our Army pilots must have at least two years of college education before qualifying for the flight training course given at Randolph Field, Texas. They also serve a year or more of active duty after graduating from flying school, during which time they learn to adapt their flying ability to specialized military missions such as photography, bombing or gunnery.

Thus it can be seen that the men who fly the service airplanes described in this book must be an entirely different stamp of aviator and infinitely more effective as a military pilot than those mass-produced warplane pilots abroad.

This all-metal high-speed attack plane is used by the Army for low-altitude ground straffing and bombing. The pilot and gunner are seated in tandem. The third member of the crew, the bombardier, rides in a rear compartment provided with a retractable gun platform in the bottom of the fuselage. Here he can protect the ship from rear attack while his shipmates operate four heavy-caliber machine guns forward.

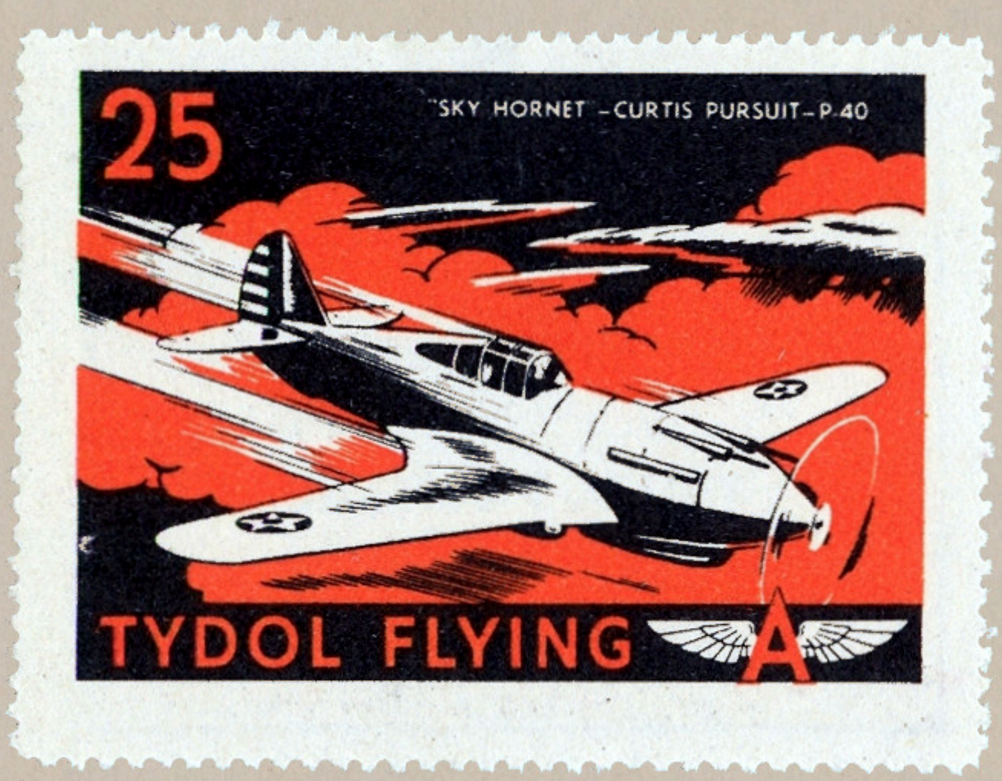


The most deadly warplane today is believed to be the Army's newest pursuit ship with the tricycle landing gear, the Airacobra. Its sleek nose houses a 37 mm. cannon which fires high explosive shells. The muzzles of 4 machine guns sprout from its stubby wings. The 1000 h.p. liquid-cooled engine behind the pilot's seat will drive the ship over 400 m.p.h. to a height of 7 miles above the earth. Such a ship has no foreign equal.

UNCLE SAM'S AIR SERVICE

Smoke screens are laid to blind the enemy, and thus mar the effectiveness of artillery fire on land or sea. The smoke screen is laid by ejecting a chemical from a fast plane flying at low altitude. The chemical volatilizes rapidly and picks up moisture from the air, thus forming a dense white fog behind which movements of troops on land or naval vessels at sea can be made unobserved. Smoke screens are effective for five or ten minutes, depending on the wind's force and direction.

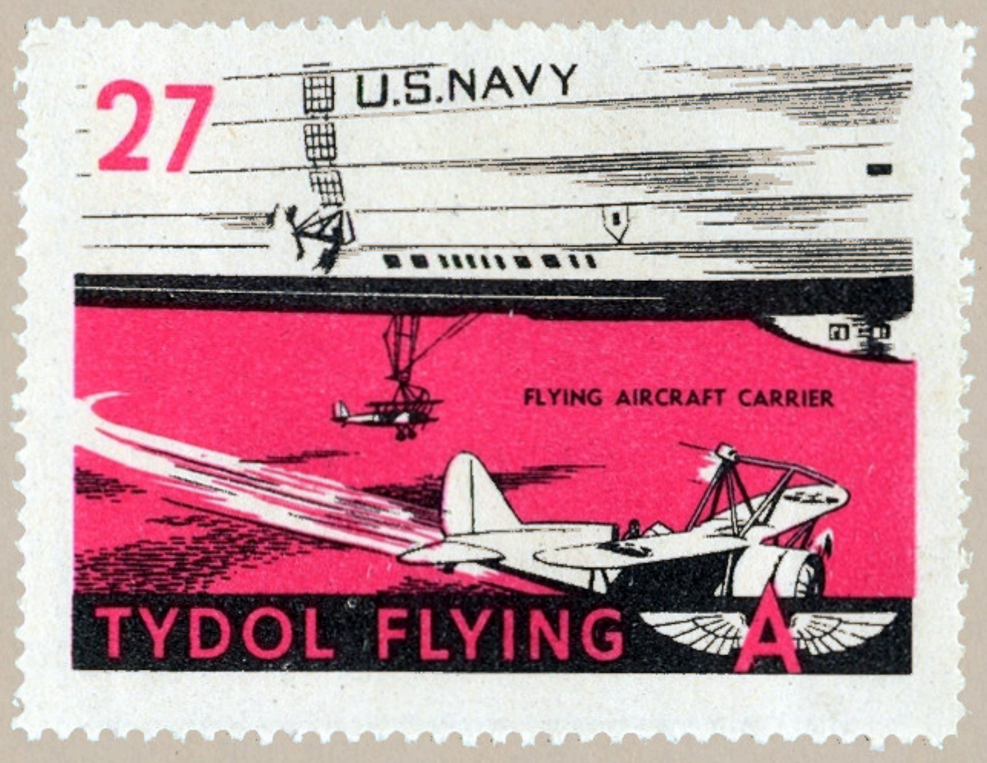
"Wheels down. Flaps down," the Colonel ordered. The leader of the seven Flying Fortresses wheeled toward Buenos Aires Airport. The Army's seven giant 22-ton, 3000-mile-range Boeing Bombers had flown non-stop 4 miles high from Lima, Peru, over the Andes to honor the new President of Argentine. The flight was dramatic proof of America's power to combat hostile influences which might threaten our South American neighbors, and our intention of helping when needed.



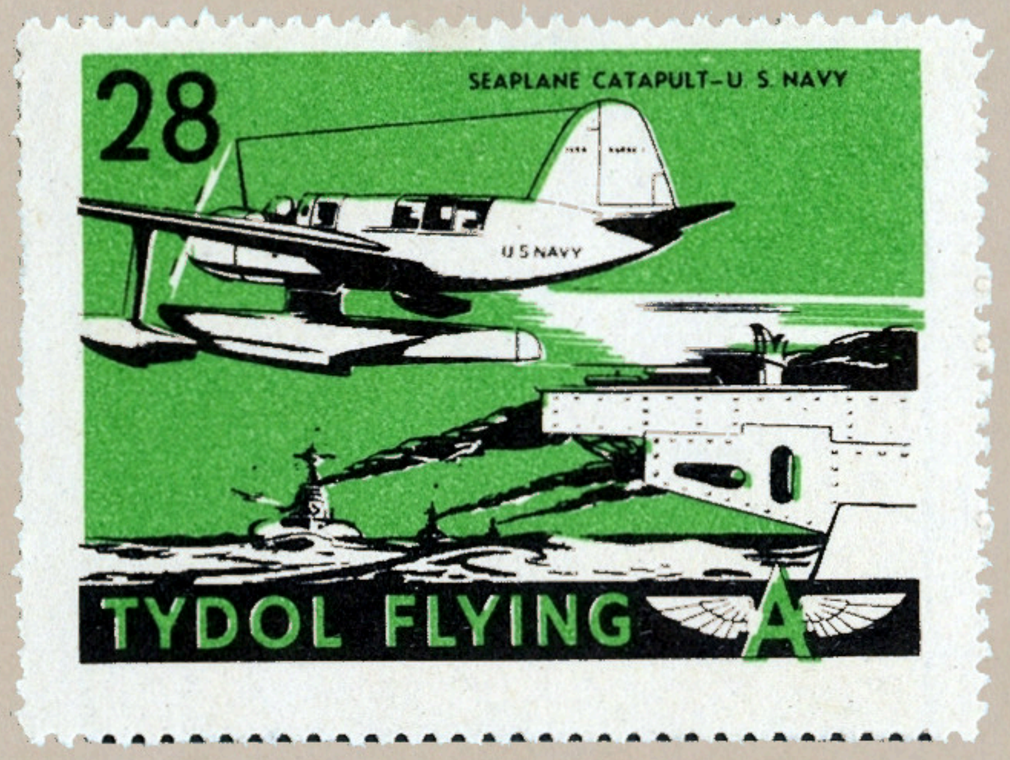
At the outbreak of World War II, American Aviation experts waited anxiously for reports on U. S. combat planes versus the deadly power of Germany's then mysterious Messerschmitt fighter. The answer was not long coming—the Curtiss Pursuits were more maneuverable, could turn sharper and climb faster than the German ships. Our Army has since developed an even hotter pursuit plane, an all-metal monoplane fighter with a speed over 400 m.p.h.

Carrier Fighters must take off from crowded flight decks with a run of only 150 feet. All of such powerful little Navy fighters are landplanes. In case of engine failure far at sea, each is equipped with emergency "flotation gear" or large rubber bags packed into the wings. When the pilot has made his forced landing in the water, he turns a valve. In a few seconds, the flotation bags are inflated by gas from a hi-pressure cylinder and the airplane remains afloat until help arrives.

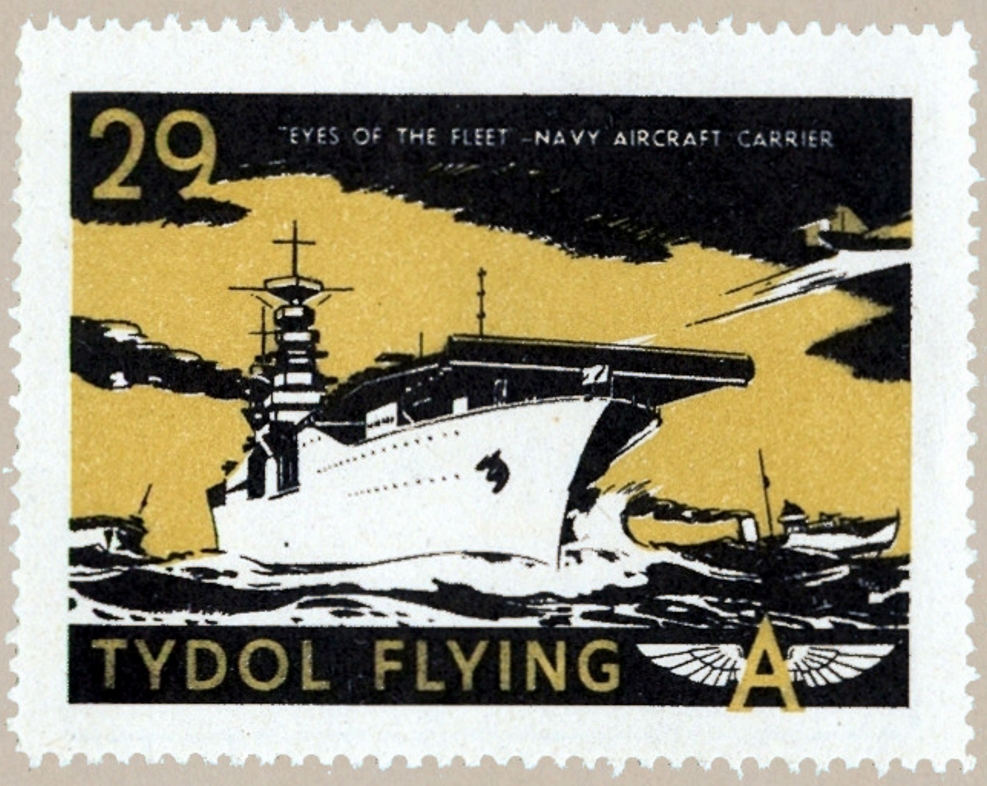
TYDOL FLYING A STAMPS OF AMERICAN AVIATION



Before America's airship program was curtailed, the Navy developed the airplane hook-on technique to a high degree of efficiency. In 1935, the Airship Macon carried five speedy airplanes within her huge hull. Such an airship, helium-filled and fireproof, equipped with scouting airplanes, operates as a high-speed aircraft carrier, with the added advantage of being invulnerable to mines, torpedoes, attacks from submarines, battleships and other hazards.



U. S. cruisers and capital ships carry seaplanes to scout the enemy and direct the fire of the big guns. As seaplanes cannot safely take off from the rough water of the open ocean, our Navy developed the launching catapult. The seaplane's float rests in a cradle on wheels. The pilot opens the throttle, gives a signal and the airplane is shot along the track reaching full flying speed in only 60 feet. The seaplanes sometimes drop alarmingly, but seldom touch the water.



The tremendous drive of their 180,000 h.p., geared electric turbine engines give the sister aircraft carriers Lexington and Saratoga a speed of over 30 knots. When a carrier is steaming into a 20 knot head wind at full speed, a fighting plane can land on its flight deck almost standing still. Highly trained deck crews stow 120 planes in hangars below decks by lowering them from the flight deck on huge elevators. Our latest shipboard planes have folding wings to save space.

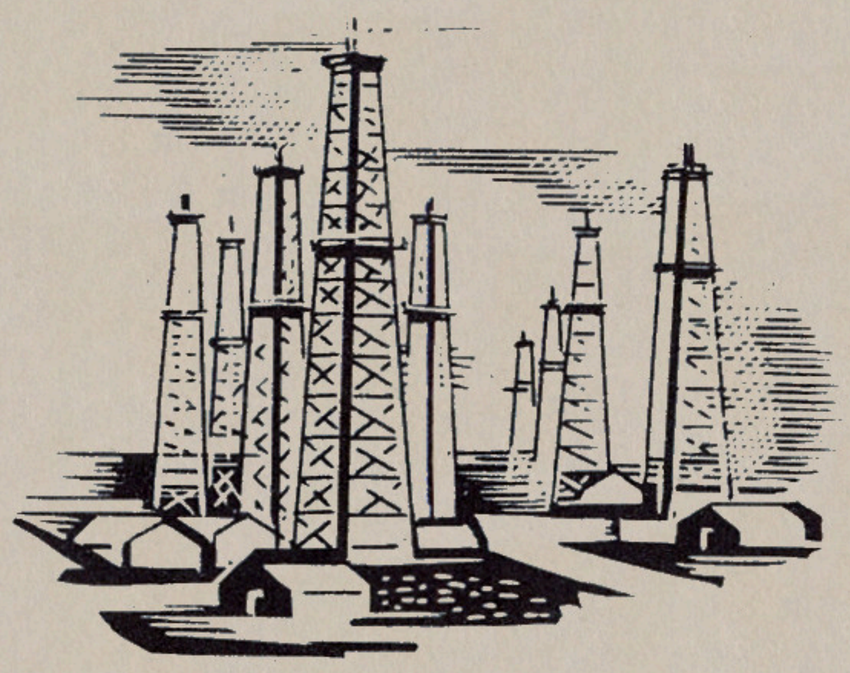
During recent Caribbean Fleet maneuvers, one of our Navy's consolidated flying boats is said to have remained in the air for three days continuously—a feat which might enable the same ship to fly across the Atlantic four times without refueling! The speed of the PBY is largely due to the elimination of wind resistance by retracting the wing-tip floats into the wing, once the ship has left the water. Such flying boats are seaworthy and take amazing poundings without damage.

UNCLE SAM'S AIR SERVICE

A freighter, miles at sea, flashes the Coast Guard base by radio . . . "Sailor has blood poisoning . . . dying . . . need immediate surgical aid." Like firemen answering an alarm, the Coast Guard aviators rush their big patrol plane down the ramp, roar out to sea. Regardless of weather, navigating by radio bearings, they spot the freighter—land amid brain-stunning crashes of spray—transfer the sick man—fly him to the hospital. Another life saved!

The pilot of a dive bomber spots his target from high altitude—rolls his ship over on its back. With engine snarling a high-pitched whine—air shrieking through struts, he hurtles straight down toward the target. At an altitude barely high enough to level off, he releases his bombs and pulls out of the terrific dive. Navy pilots know they cannot strain a sturdy dive bomber by pulling out too abruptly, as the pilot would become unconscious before he could "overload" the wings.

"LIQUID GOLD" FOR YOUR MOTOR CAR



EIGHTY-ONE years have elapsed since Colonel Drake discovered the "Liquid Gold" of western Pennsylvania. But up to now, throughout the entire world, no one has found as rich an oil as this precious Bradford-Pennsylvania crude.

Today, that *same* crude oil *makes possible* the Veedol Motor Oil which safeguards millions of America's finest motor cars. This crude oil is carried direct from the Pennsylvania fields through the original pioneer pipe line to the great Tide Water refinery at Bayonne, New Jersey. There it is processed into Veedol, the motor oil with the famous "Film of Protection." This oil film brings to your modern high-speed motor lubrication that offers fluidity *plus* clinging qualities . . . heat resistance *plus* low consumption. And *those* are the characteristics you should demand of your oil.

WINGS TODAY AND TOMORROW

DURING the past few years, the amazingly rapid growth of aviation has attracted the youth of the nation toward this fascinating new industry. In stores, offices, factories, schools and colleges in every part of the country, boys and girls are aspiring to careers in aeronautics—a field which demands the utmost of man's ingenuity in applying modern sciences to the mastery of the elements.

These enthusiasts soon realize, however, that aviation today has no place for people without education. Those with foresight plan their careers at an early age, beginning by building model airplanes, collecting pictures and reading aviation magazines. The result is that the average youngster of today has more detailed information about the latest military and civil airplanes than most parents know about the family car. In school, these future airmen take a new interest in geography, mathematics, physics, and chemistry, knowing that these courses are needed for aerial navigation, an understanding of aircraft structures, engines, instruments and the weather. Later they enroll for special aviation courses—learn sheet-metal working, welding and engine overhaul; all the while saving up to learn to fly.

Although approximately nine out of ten jobs in aviation today are on the ground and not in the cockpit, practically everyone connected with the industry cherishes an ambition to learn to fly. There are several approaches to the problem of winning wings. A student with the necessary financial resources can buy a lightplane and receive flying instruction in his new ship—a free service now offered by many airplane dealers—or else he may enroll in a good commercial flying school. Each year, also, a limited number of college students are now eligible for the Civil Aeronautics Authority (CAA) flight training course. By this plan the undergraduate receives enough instruction and solo flying experience at government expense, to qualify as a full-fledged private pilot.

But for young men determined to become the finest pilots, instruction and modern aviation facilities can produce, the Reserve training now offered by the Army, Navy and Marine Corps

presents a priceless opportunity to those physically and scholastically qualified. Pilots who win their wings in these famous training schools and complete a tour of active duty after graduation, have little trouble finding career jobs with the airlines as co-pilots and later as captains of the great commercial airliners.

The future in aviation holds an ever increasing speed—that priceless commodity which makes air travel valuable. Multi-engine ships carrying hundreds of passengers at 600 m.p.h. in the substratosphere, far above fog, ice and storms — routine instrument-controlled landings independent of bad weather — such accomplishments are but a few years away. But even before speed comes safety. Everyone interested in aviation should remember a statement made by C. R. Smith, President of American Airlines—a reflection guiding the operating principles of this great airline which has established an amazing all-time record for safe flying—"Aviation is not unsafe, but, like the sea, it is terribly unforgiving of any carelessness or neglect."

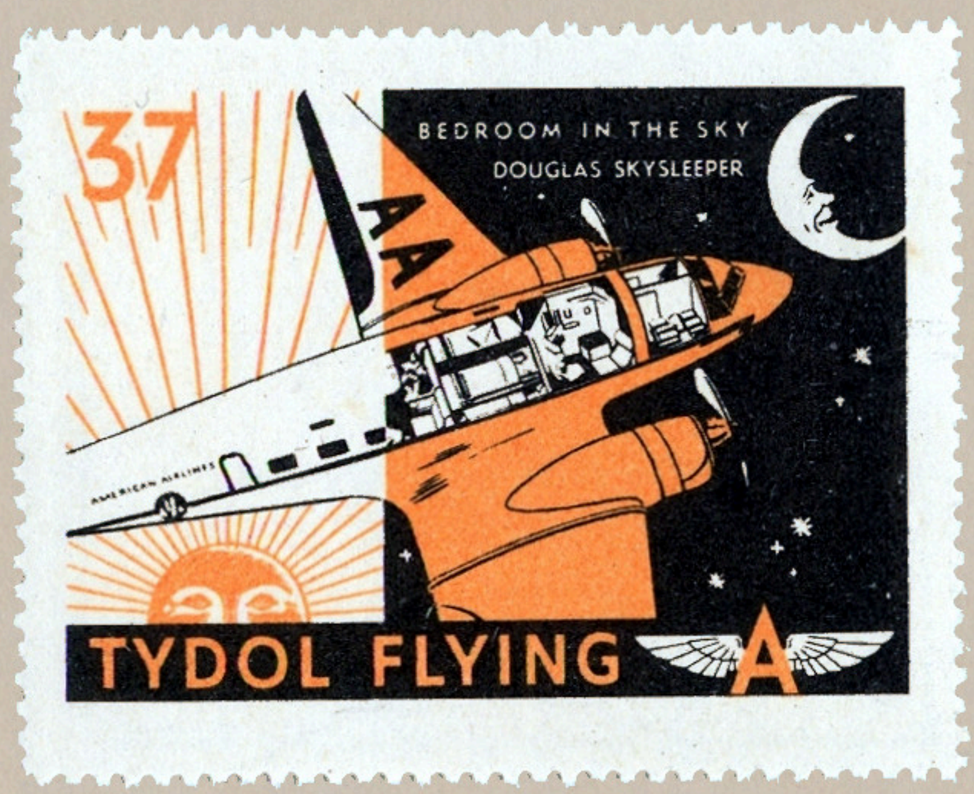
Movies, newspapers and magazines have erroneously pictured the test pilot as a cold-blooded fatalist who flirts with death for a fee. Jimmie Taylor of New York, famous professional test pilot, is a careful engineer whose job is to fly expensive first models, observe their performance and "bring them back alive." Taylor has test flown airplanes for the last 20 years, has never been hurt, has never had to use a 'chute. Taylor's good luck is due to careful preliminary study of each aircraft he tests.

An intriguing job open to girls today is that of air stewardess of a 200-mile-an-hour Flagship. Hazel Brooks, 26, flew the airline for four years before she became chief stewardess of American Airlines. Now she picks and trains the new stewardesses. Besides being attractive and intelligent, applicants must be registered trained nurses between 21 and 26 years old, under 120 pounds and not taller than 5 feet 5 inches. Miss Brooks is the perfect example of a stewardess.

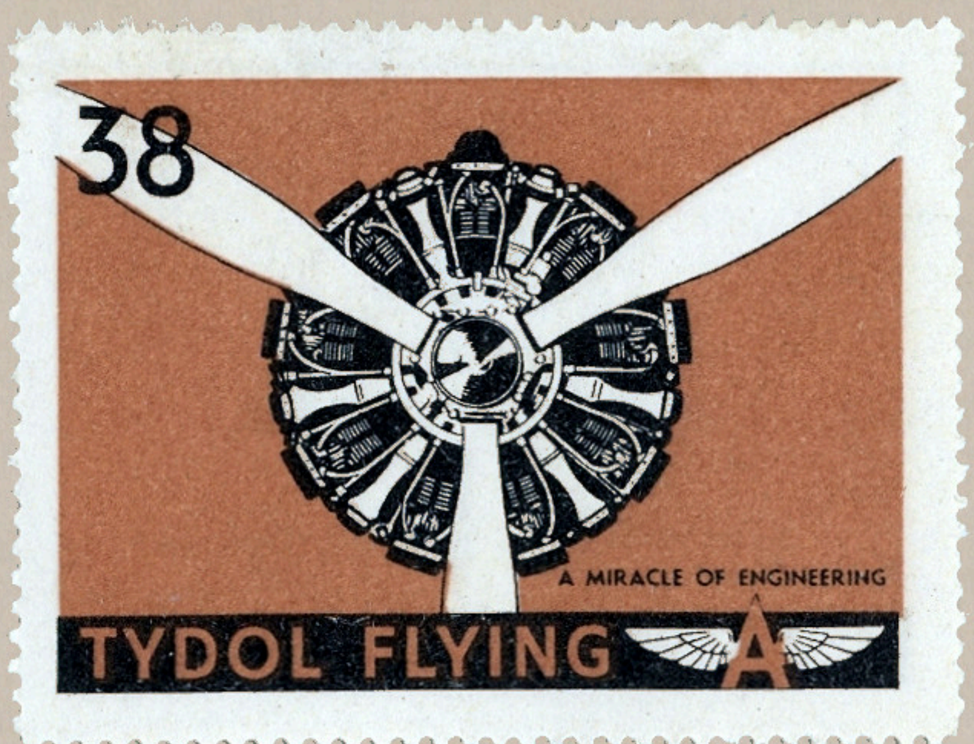
TYDOL FLYING A STAMPS OF AMERICAN AVIATION

No profession requires a more exacting education and hard earned experience than the job of being an American Airlines Flagship Captain. Joe Glass, million miler skipper of American's famous transcontinental "Mercury," is a good example of a first class airline pilot. Glass grew up with aviation, gaining his experience before joining American Airlines by barnstorming, flying the mail, as an officer in the Army Air Corps and operating a flying school.

Largest airplane in the world is the 41½-ton Boeing Clipper now being operated on the long ocean hops across the Atlantic and Pacific. The Clipper has flown to Europe in 24 hours with a ten man crew, 40 passengers, and 2½ tons of cargo. The wing span of the Clipper is nearly half a city block long, and mechanics can service any of the four 1500 h.p. engines in flight, by passing through a walkway or corridor inside the wing, extending as far out as the outboard motors.

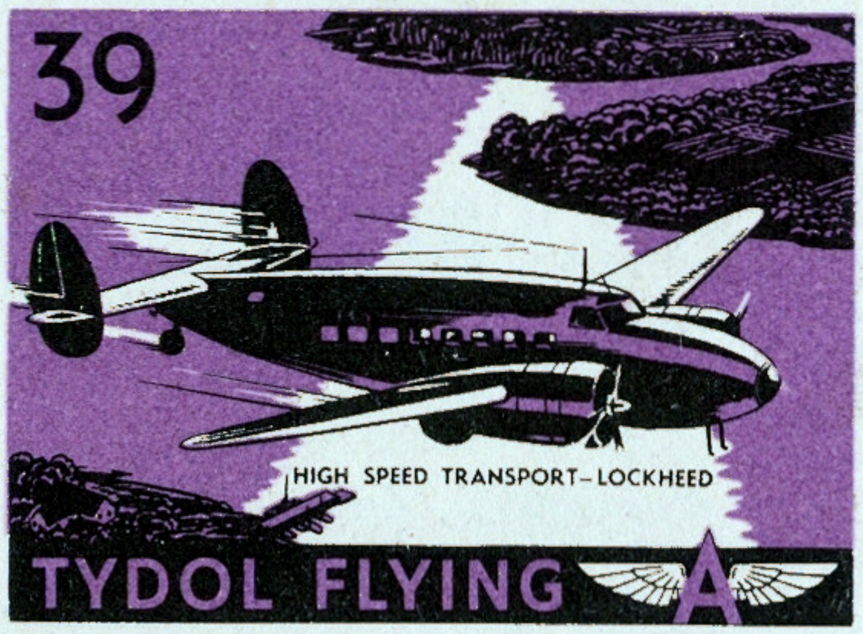


The three-mile-a-minute Flagship Skysleeper planes used by American Airlines for overnight transcontinental flights are the last word in travel luxury. The cabins, which accommodate 28 passengers by day, sleep fourteen in upper and lower berths at night, are air-conditioned and steam heated. Floors are carpeted, windows neatly curtained. At meal time, trim stewardesses serve passengers piping hot dinners from a special galley located aft of the pilot's compartment.



When you drive a car 45 m.p.h., the engine turns at about 3,000 revolutions per minute. A Flagship's engines at cruising speed, however, turn only 1,800 rpms, or nearly half as fast. Great power at low crankshaft speed is one reason why modern aircraft engines rarely fail in spite of light construction. Compare the Wright Brothers' 16 pounds per horsepower engine, to the one pound per horsepower Curtiss-Wright "Cyclone" engines which drive the Flagships.

WINGS TODAY AND TOMORROW



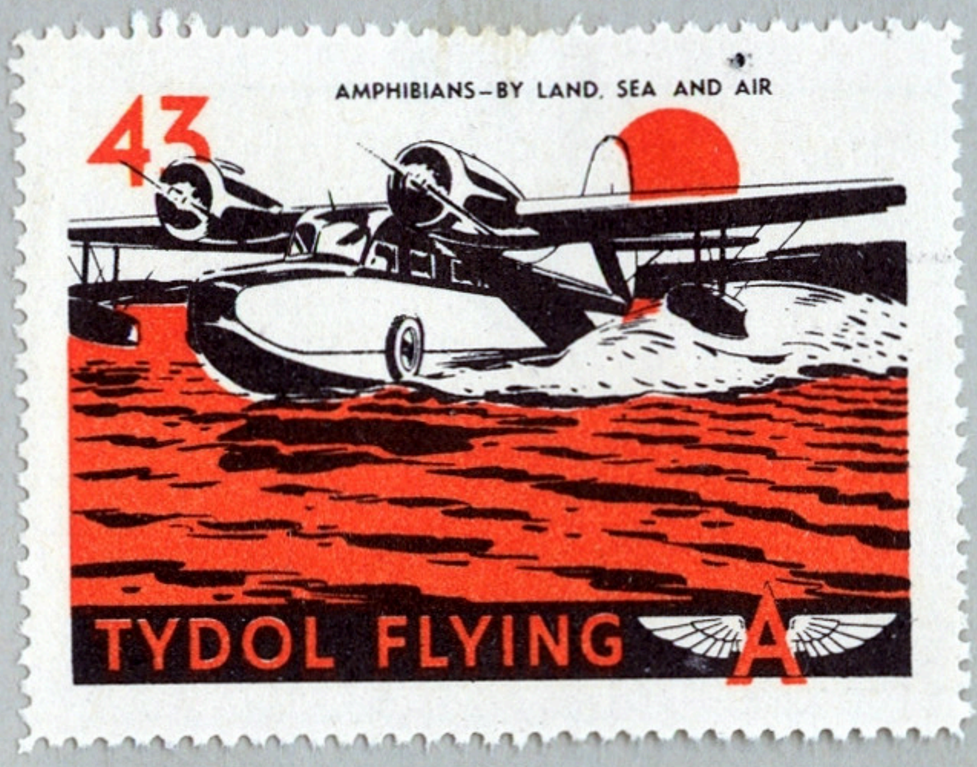
Probably the fastest commercial transports in the world today are the two motor, American-built Lockheed planes. These ships are used extensively by airlines in the Far East, Australia, Canada, Europe, and by some smaller airlines in the U. S. Lockheeds are recognizable by their squat fuselage and twin rudders. With slight modification this airplane has been adapted to the needs of the British Air Ministry as a high speed reconnaissance bomber.

Soaring aircraft are launched from hilltops or level ground by man power, or by a "winch" which reels in a long tow cable attached to the sailplane. As the craft gains air-speed, it rises at the end of its tow cable like a giant kite. The pilot then "cuts loose" and sails away, gaining additional altitude by maneuvering in currents of rising air found beneath cumulous clouds, along ridges, hills or sand dunes. Soaring in the U. S. is conducted by the American Soaring Society.

"Bail out!" Pull the ripcord. The handkerchief-size pilot chute pops open—catches the air. In less than 5 seconds a 28-foot canopy of silk billows out and slows you from a free fall of about 118 m.p.h. to a descent of 16 feet per second. The landing shock is equivalent to a jump from a twelve-foot platform. Airmen saved by parachutes qualify for membership in the "Caterpillar Club," and are eligible to wear a gold caterpillar insignia symbolic of the silk worm.

The beam, a pathway of sound by which a pilot can fly straight to the airport of destination, consists of radio signals fanning away from an airport into four narrow paths of sound. If the pilot is flying on one side of the airway, he hears the code letter "A"; on the opposite side, he hears "N." When he hears the blending of "A"s and "N"s, he knows he is on course. Directly over the station there is a signal fade-out called the "Cone of Silence."

TYDOL FLYING A STAMPS OF AMERICAN AVIATION



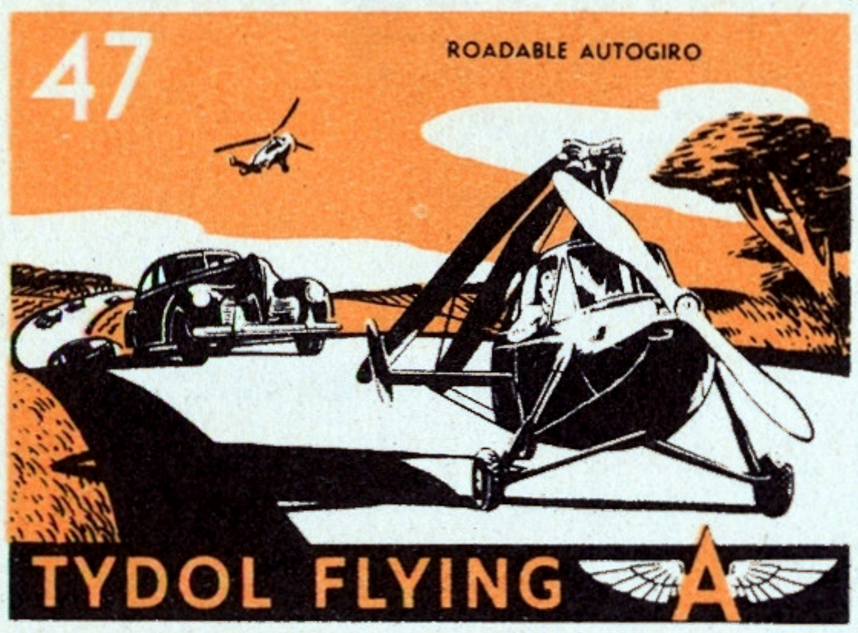
An aircraft able to land on either water or land, has a distinct advantage. Modern high performance amphibians such as the "Grumman-21," used by the Coast Guard and private owners, are a combination of the fuselage of an airplane and the seagoing hull of a flying boat equipped with retractable landing wheels. The engines are placed high on the wing to keep the propellers clear of spray when maneuvering on water. Amphibians perform well as either land or seaplanes.

The "lightplanes"—small, 2-place cabin monoplanes powered by 50-h.p. engines, are America's most popular aircraft. Several airplanes of this type are priced between $1,000 and $2,000 new. Such little ships are extremely stable; cruise around 80 m.p.h.; and cost less to operate than the average car—from 1½ to 2c per mile. Any good automobile driver with normal vision should be able to fly a lightplane solo after eight hours of instruction. Lessons cost about $10 an hour.

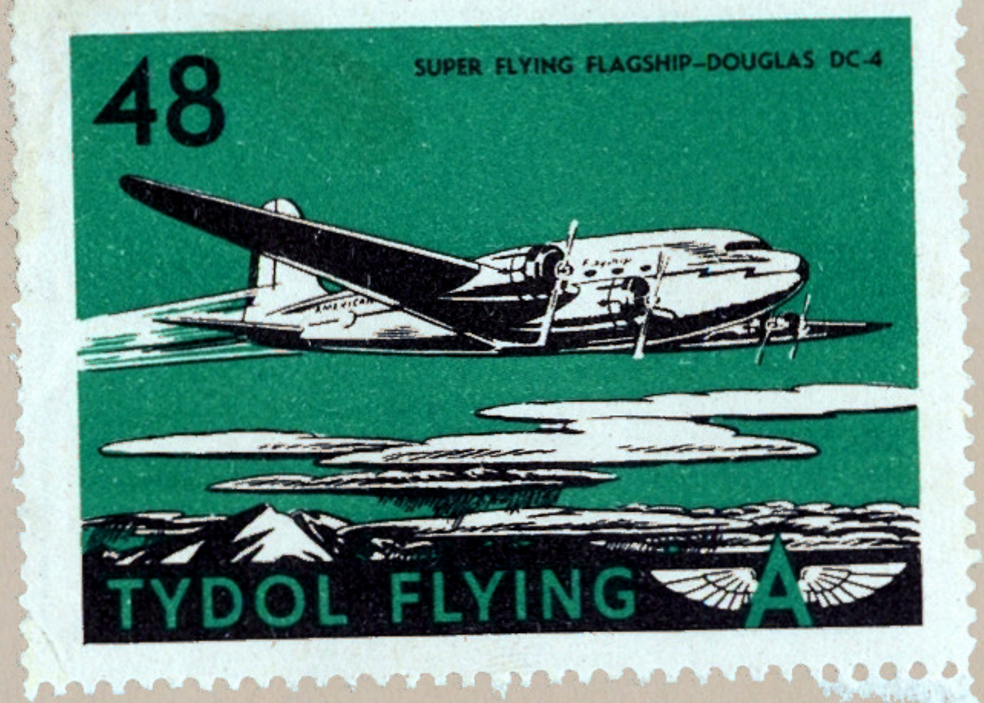
A fast diminishing speck of smoking fury vanishes into the clouds with a thundering roar—the departure of a long range radio-controlled rocket ship. This scene might well be enacted daily on U. S. airports within our lifetime. The power and speed of a rocket ship depends upon the principle of "jet propulsion," the recoil created by exploding gases. Scientists believe that the harnessing of atomic energy will make commercial rockets practical.

Most landplanes can be converted into seaplanes by substituting pontoons or floats for the usual wheel landing gear. Until 1939, when a German pilot flew 469 m.p.h. in a Messerschmitt landplane, high speed records were held by seaplanes, as the hazards of landing a very high speed airplane are greatly reduced if the pilot can let down on a body of water miles long rather than on limited runways. Now retractable landing gears make land planes the fastest.

WINGS TODAY AND TOMORROW



Three years ago the government sponsored the development of an experimental "Roadable Autogiro," a unique aircraft designed to meet the flying limitations of the average man. The engine is connected to the landing gear by a transmission, so that when the autogiro rotor is folded back the little machine can travel on the highway with automobile traffic. The experimental machine flies at 90 m.p.h. takes off in 40 feet, and can land vertically in confined spaces.



Due to the tremendous increase in the public's acceptance of air travel, American, the largest domestic airline, has ordered the construction of a fleet of fifteen giant 4-motored, 42 passenger airplanes, larger, faster, more luxurious than any land air transports ever seen. These new giant Flagships, now being built by the Douglas Aircraft Corporation, are equipped with air-tight cabins which insure normal atmospheric pressure even when flying 5 miles high.

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