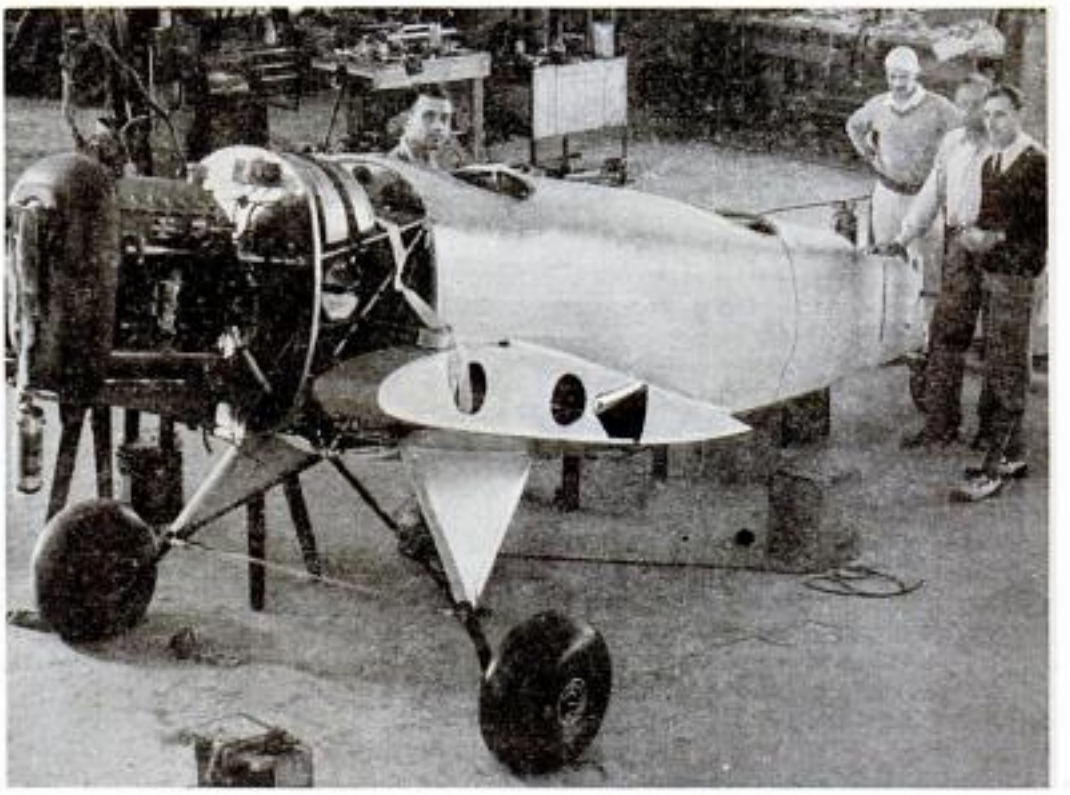
A New Cornelius Self-Stable Plane



The Cornelius plane in the shop showing the method of connecting the variable wings to the body stubs. The entire outer wing moves—there are no ailerons.

A NEW departure in airplane wing construction has been introduced to Southern California flyers by G. Wilbur Cornelius after eighteen years of research. Called the "Fre-Wing," the new low-wing monoplane has been successfully flown in a series of demonstrations and will soon be manufactured in a Los Angeles factory.

Due to its unorthodox construction, the inventor claims that the new wing construction makes the plane virtually "foolproof." He backs his claim with a demonstration of "hands off" flight, climbing out of the cockpit and sitting astride the fuselage while the ship flies itself.

Instead of being stationary, the wings move on an axis situated at the exact center of lift which is approximately one-third of the distance from the leading edge to the trailing edge of the wings. The entire wing surface is moved at the pilot's will from the cockpit, no ailerons being used, as the wings themselves serve in this capacity.

Floating as free units, the free wings operate in unison with the tail surfaces on the present ship. Some of the advantages given, according to designer Cornelius, are freedom from stalls, tail spins and elimination of shock to passengers and pilot while in bumpy air. Wing flaps on the trailing edges aid in restoring the craft to level flight when the center of lift is moved by uneven air.

Greater strength is claimed due to the stress being placed on the center of lift when the craft levels off after a steep dive, this eliminating torsional stresses.

Landing speed is reduced from 10 to 15 miles per hour over conventional types of planes due to wing flaps. The current model cruises at 125 m.p.h., lands at 45 and has a top speed of 147 m.p.h. It consumes seven gallons of gas an hour at cruising speeds and has a seven-hour gasoline capacity.

The ship will be built in quantity at Metropolitan airport, Los Angeles, by Cornelius and his associates.

(*Concluded on page* 413)

The Cornelius monoplane assembled and ready for flight. Notice that the outer wing is depressed below the stub, thus doing away with the necessity for ailerons.

Cornelius

(Continued from page 360)

The improved design is modeled after a seagull, with the wings attached to the fuselage like a Douglas bomber. It will be almost entirely automatic in flight, leaving only take offs and landings for the pilot to concentrate on. To remove the mental hazards of flying a ship with similar speeds, Cornelius has included a stub wing which is in the front of the assembly and gives the ship a somewhat conventional appearance while on the ground.

However, in the air this wing is seen to be the front of the ship. The front wing tends to keep the nose in the air while landing and thus reduces hazards of landing to a minimum. This is an automatic result achieved by design and is a high safety factor.

In case of acute emergencies while in the air, a plane parachute is provided. It is released from the cockpit and the method of suspension of the ship from the chute prevents the ship from oscillating while descending, heretofore a serious drawback in plane chutes. The variable wings permit change of direction of the air moving into the chute as the plane descends, thus permitting the spilling of air from either side of the chute and controlling landing at a desired spot.

Releasing the chute automatically cuts out the propellor, preventing a panicky pilot from opening his plane chute with the motor full on.

Another automatic feature is the pilot's ability to set the free wings so that they will hold a course at a given altitude and given motor speed. Advantage has been taken of known barometric pressures at certain altitudes and the automatic device works on this principle. While it is possible to land the ship with this device on, set we will say, for a course at 5,000 feet with a motor revolution speed of 3,500, if the device is not changed immediately on taking off again, it will put the ship back at the 5,000-foot level and keep it there.

No stabilizer is used, as there is no tail section. Automatic lateral stability is secured with the wing flaps which act similar to the usual stabilizer. The free wing design permits the ship to act like a swimmer going through the surf. The ordinary plane with fixed wings bounces over the waves of air and down into the troughs while the free wing slides through the peaks and depressions like a swimmer diving through oncoming waves, Cornelius says.

The wings may be removed in from five to seven minutes. This permits parking of the wings only in hangar space at the flying field. The fuselage then may be driven to the owner's home like an automobile.

To facilitate driving, the motor has two transmission systems. One is geared to the propellor on a shaft drive for air work, the other to the two landing wheels under the main wing for road work. A third wheel under the stub wing prevents nosing over when landing and steers the plane on the ground. The rudders are of semaphore type, located under each wing tip and horizontal to the line of flight. They drop down from the wing only when in use.

While two speeds are provided in the two transmission systems either one may be cut out. The gears are always in mesh and the shifting is controlled by the pilot. Use of the second gear in the air on the propeller drive gives a 75 per cent increase in power.

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