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NAVY'S FLAPJACK MYSTERY PLANE  
It Hovers Like a Helicopter! Will It  
Fly Faster Than the Speed of Sound?  
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**THE MAN WHO MAKES MONSTERS  
BUILD A SOAP-BOX DERBY WINNER SEE PAGE 112**



# The Flying Flapjack

BY GILBERT PAUST



Photos by Rudy Arnold

**It looks like an aviator's nightmare, but this Navy job is the fastest - and slowest - plane in the air.**

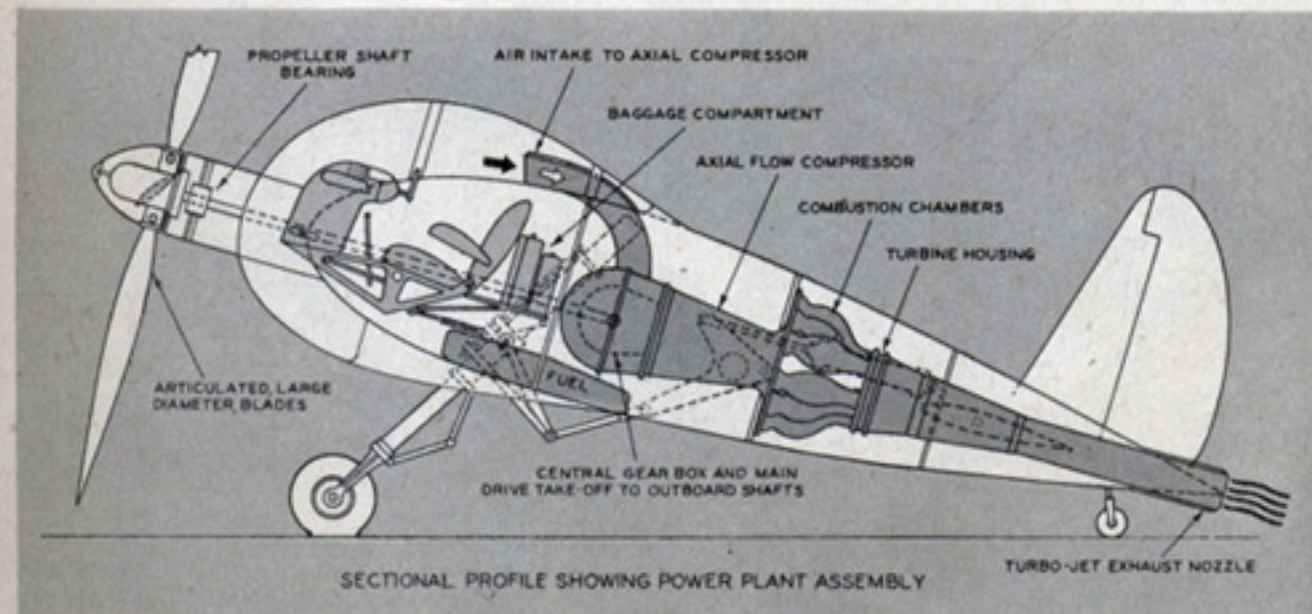
**T**HE Navy has a flying Flapjack, and brother—it can fly!

It all began on a day in November, 1942, when the doors of the Vought hangar opened and test engineers trundled out a queer, saucer-shaped object on two long, stilted legs—and claimed it was an airplane. The V-173, they called it, and gave credit for its design to an aeronautical engineer who had been active in NACA research and had recently joined the staff of Chance Vought: Charles H. Zimmerman.

The test pilot, Boone Guyton, climbed the ladder that led to the small door under the nose, and entered the pilot's nacelle. The two huge, three-bladed propellers, protruding from the sides and looking more like helicopter rotors mounted vertically than conventional "props," started turning. With its nose pointing into the sky at a steep angle, the Flapjack flew.

Not much has been told about that first flight. The plane's first performance did not cause a great sensation among the

Tomorrow's Flapjack will be equipped with a gas turbine and jet assist, making higher speeds possible.







The V-173 is entered through a hatch below the pilot's cabin. Excellent visibility is provided through nose.

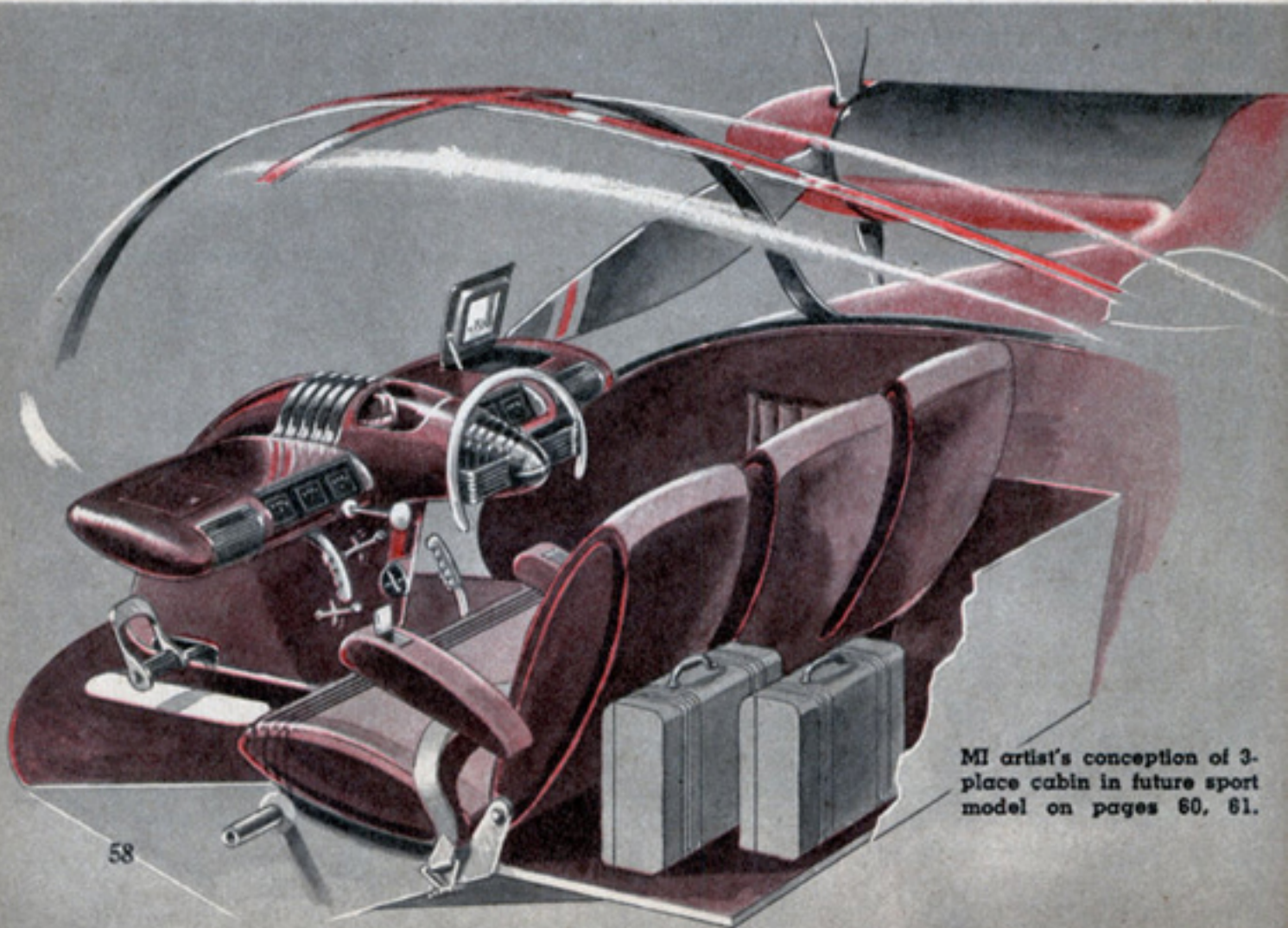


The XF5U-1 has retractable gear and is powered by two 1800-hp. engines. It is metal covered and uses four-bladed propellers, although its plan-form is the V-173.

press at that time. The world was at war and there were many more important events happening in the skies to take the headlines. This new "crate" was just a bad dream, too radical a departure in aircraft design to be taken seriously. Even military censorship didn't know exactly how to handle it. Photographers shot some pictures; these were published and soon forgotten.

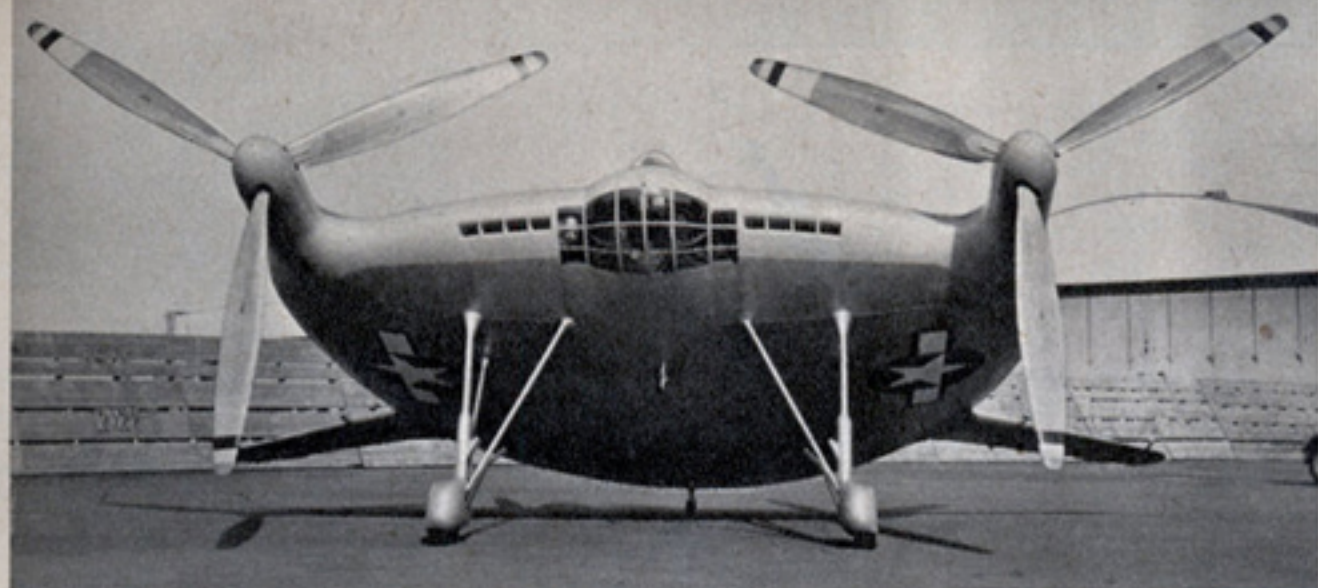
A couple of years later a new, slicked-up model was announced, bearing the Navy insignia and the designation XF5U-1. Nothing much was said about it. No mention of a test-flight was made. A couple of "hangar" pictures found their way into the newspapers and then the Flapjack faded from view, quickly smothered by warfront news.

The Flapjack wasn't scrapped; it is po-



MI artist's conception of 3-place cabin in future sport model on pages 60, 61.





High landing gear are necessary to hold propellers clear of ground. Airflow covers wing and tips.

tentially the world's most versatile airplane. All attempts to obtain information from its manufacturer and the Navy on its present status and performance have met with blunt refusals. The following facts have been gathered for you from reliable sources. Read them over and take your hat off to the slickest thing in the air!

The basic wing plan of the plane is a circle designed as an airfoil to obtain lift from the air, at the same time serving as fuselage to house the pilot and engines. The large propellers are tractors, driven by fuselage engines with which they are connected by a gear-and-shaft arrangement. They turn at approximately  $\frac{1}{3}$  the speed of the engines. The propeller shafts project forward from the sides of the wing, positioning the propellers so that their airflow is continuous over the wing.

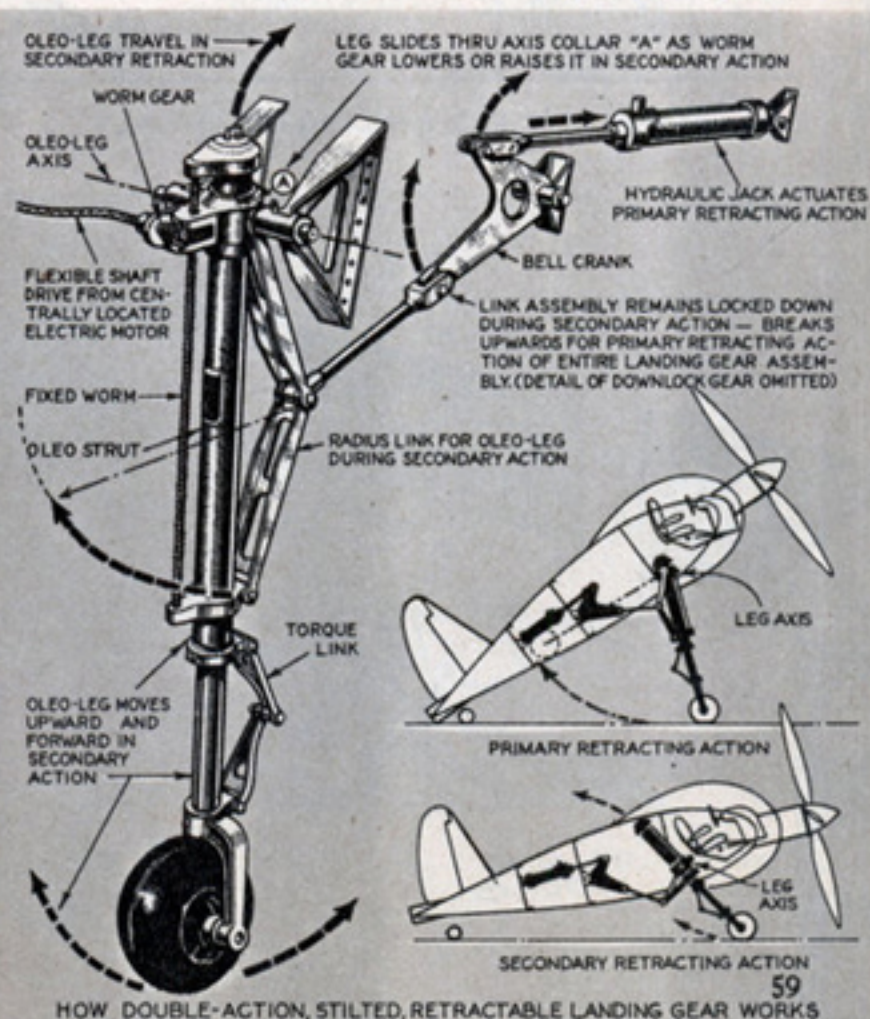
A conventional wing "stalls" (loses lift) when the airflow over its surface, caused by the travel of the wing through the air, is broken (burbles) at slow speed. In the Flapjack, however, since the airflow over the wing is not caused by its motion but by the propellers, the airflow remains unbroken and lift is maintained even at slow speed. Although the actual aspect ratio of the wing (span divided by width) is less than

one, the effective aspect ratio is approximately four since the propellers rotate against the wing tips, maintaining flow here also and increasing the effective span of the wing.

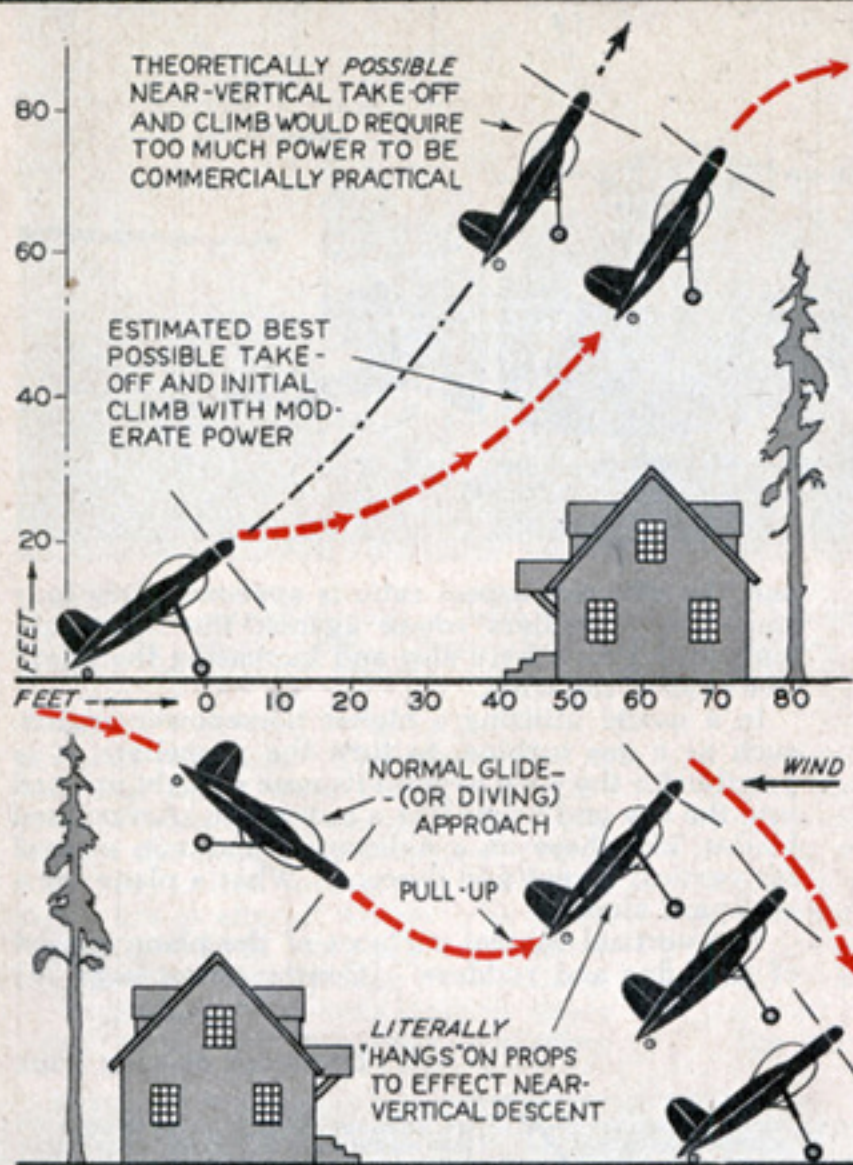
In a model utilizing a higher horsepower engine, such as a gas turbine, to turn the propellers, it is possible for the wing to point its nose straight upward into the sky and hover like a helicopter. Articulated blades, like those on a helicopter, maintain control for vertical ascent and descent. What a plane for a backyard airport!

The vertical control surfaces of the plane consist of twin fins and rudders, [Continued on page 79]

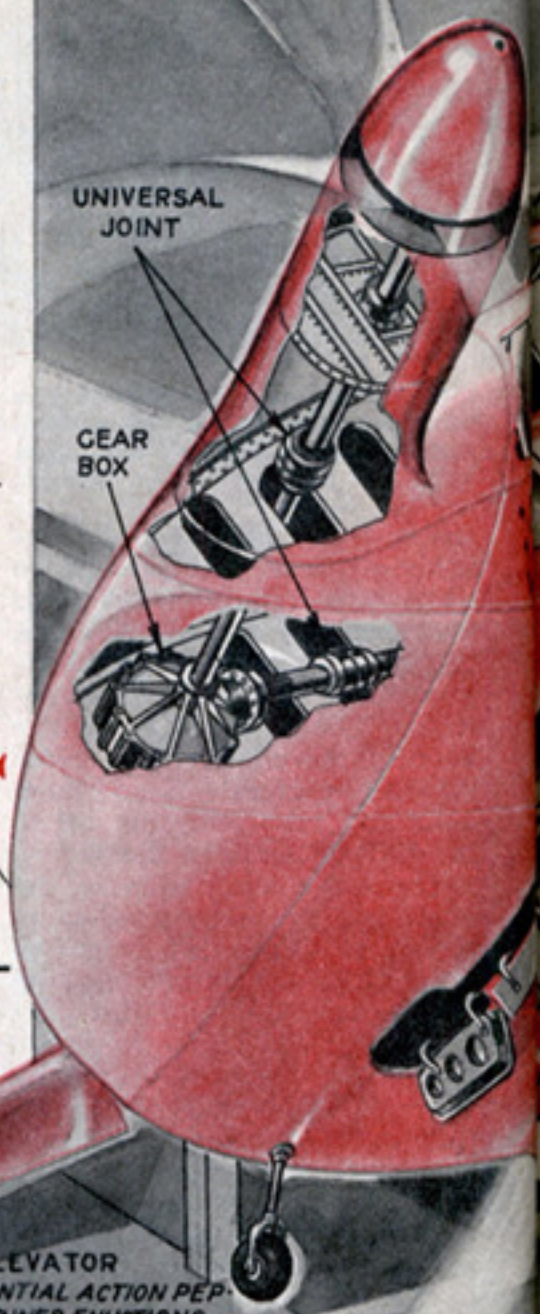
Drawings on next page







TAKE-OFF AND LANDING POTENTIALS



COMMUNITY HANGAR

SEAT UNIT  
NORMAL

AILEVATOR  
(DIFFERENTIAL ACTION PER-  
MITS COMBINED FUNCTIONS -  
AILERON AND ELEVATOR)

DOUGLAS  
ROLFE





The slow-fast flight characteristics of the Flapjack make it an ideal design for a sportplane. With extending, retractable landing gear (as shown on previous page), this 3-place model, designed by an MI artist, could operate from small fields only slightly larger than an ordinary backyard. At right is the V-173 in flight.





## Navy's Synthetic War

[Continued from page 56]

up, say, an irregular enemy shoreline, the contour of the shore is reproduced in the scope. The same thing happens when the sound beam picks up this shoreline from the relief map. By means of calibrated concentric rings in the scope, the pilot can not only tell just about how far away he is from the shoreline, but when he is making an actual flight and again sees this shoreline in his scope, he can recognize it at a glance and quickly determine his position. As in the Contact Flight Trainer, an invaluable feature of this radar trainer is that a contour map accurately reproducing a large section of enemy terrain can be built and installed in a few hours.

Perhaps the most ingenious of all the center's synthetics, however, is an optical-mechanical device by which submarine students can make practice torpedo attacks on enemy ships. Enclosed in a small room is a regulation periscope through which the student seeks out and finally spots the enemy ship, a small model whose movements are controlled by an instructor in another room.

Sighting his target, the student maneuvers his submarine by calling commands through a speaking tube in response to which an assistant mechanically traces the path of the sub on a special glass viewing screen, the sub's path being indicated by a zigzagging, ever-lengthening line of green light. Also standing at the screen is the instructor who, watching the movements of the attacking sub, sends the enemy ship darting about in an attempt to outmaneuver the sub, the path of the enemy ship appearing as a zigzagging red line of light.

As viewed through the periscope, the fight is as real as any ever seen in actual warfare. If the ship approaches the sub, it grows larger in the periscope's eyepiece. If it recedes, it grows smaller. If it speeds up, its wake gets bigger. And if it runs away, it can drop down over the horizon so that only its superstructure is visible.

By means of other controls, the instructor can also arbitrarily place the sun at any point in the sky, and can create almost any type of lighting, such as bright sunlight, cloudiness, twilight, moonlight or fog. By judging the speed and direction of the enemy ship, the student jockeys his sub into what he believes is a good firing position, lets go with a torpedo (his shot being recorded on the viewing screen), and then quickly begins to maneuver for his next shot.

After he has fired three or four torpedoes, the student is brought around to the viewing screen where he is shown his tactical errors and successes as well as hits and misses. •

## The Flying Flapjack

[Continued from page 59]

mounted on the rear of the wing, each pair being in the slipstream of a propeller. Two horizontal control surfaces extend from the sides of the wing near its trailing edge. These serve both as elevators and ailerons and accordingly are called "ailevators." They rotate together when functioning as elevators, and differentially when functioning as ailerons.

The V-173 was a wood-and-fabric ship, single place, with 16-foot, three-bladed propellers powered by two 75-hp. engines. In its tests it flew as slowly as 20 mph. and as fast as 100 mph., and could land at a 45° angle at a speed under 20 mph. Its propellers turned over at about 600 rpm. at take-off and 450 rpm. at cruising speed; compare these with the take-off speed of 2,300 rpm. or more and cruising speed of 2,100 rpm. in conventional aircraft. It carried long, fixed landing gear which, no doubt, held down its top speed. The extreme length of the gear was necessary to hold the propeller tips clear of the ground, however. This explains the high angle at which the Flapjack has to hold her nose on take-off and landing.

The blue XF5U-1 is similar in design to the V-173, but with 19-foot, four-bladed propellers. It is all-metal with fully retractable landing gear and two Pratt-and-Whitney R-200-2, 1,800-hp. engines, so geared that one engine can turn both propellers in the event of failure of the other. Its reported speed range is from 40 mph. to 425 mph.; with water injection its top speed is said to reach almost 500 mph. In the future it is planned to install a single gas turbine in a nacelle behind the pilot's cabin. With this single power plant operating both propellers, it should be possible for the Flapjack to hover at 0 speed and reach well over 500 mph.

With a jet or rocket engine and the pilot in a prone position to reduce the thickness of the wing, the Flapjack offers a sure bet to lead the field in the race to smash the supersonic barrier. The air resistance to a plane's flight caused by all parts of the plane which do not contribute to its lift is called "parasite drag." In such a jet wing there would be no such resistance—no extended landing gear, no engine drag, no fuselage. The only resistance would be caused by skin friction of the wing's surface. Of course, without propellers the hovering ability of the plane would be lost.

So don't be amazed when one of these days you hear a whistling sound from the sky and see a blurred, circular object scaling across the heavens at a speed never before attained by man! It will be the Navy's Flapjack, the XF5U-?, breaking through another frontier in aviation's history. •