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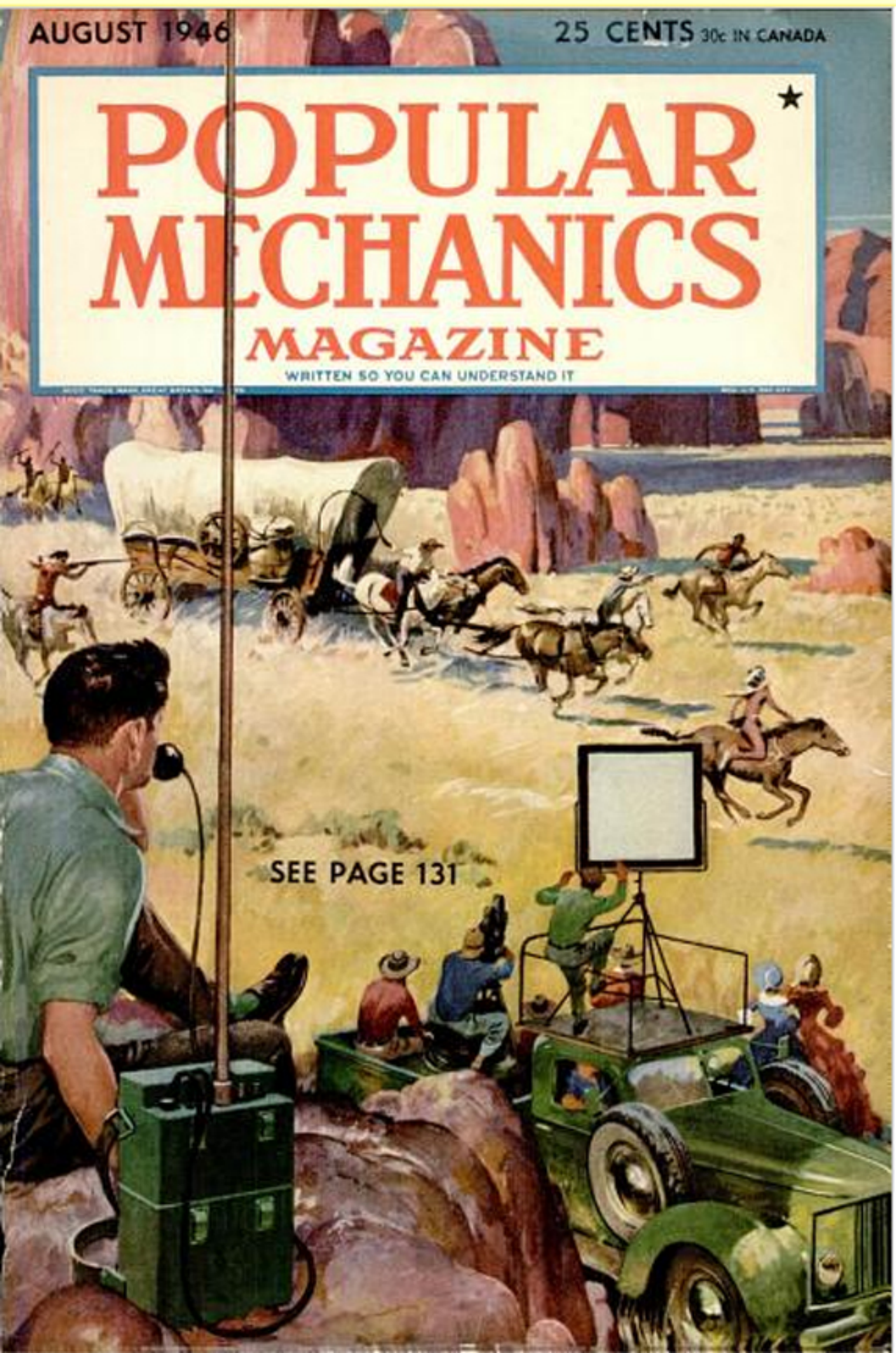

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Sailing in the Sky

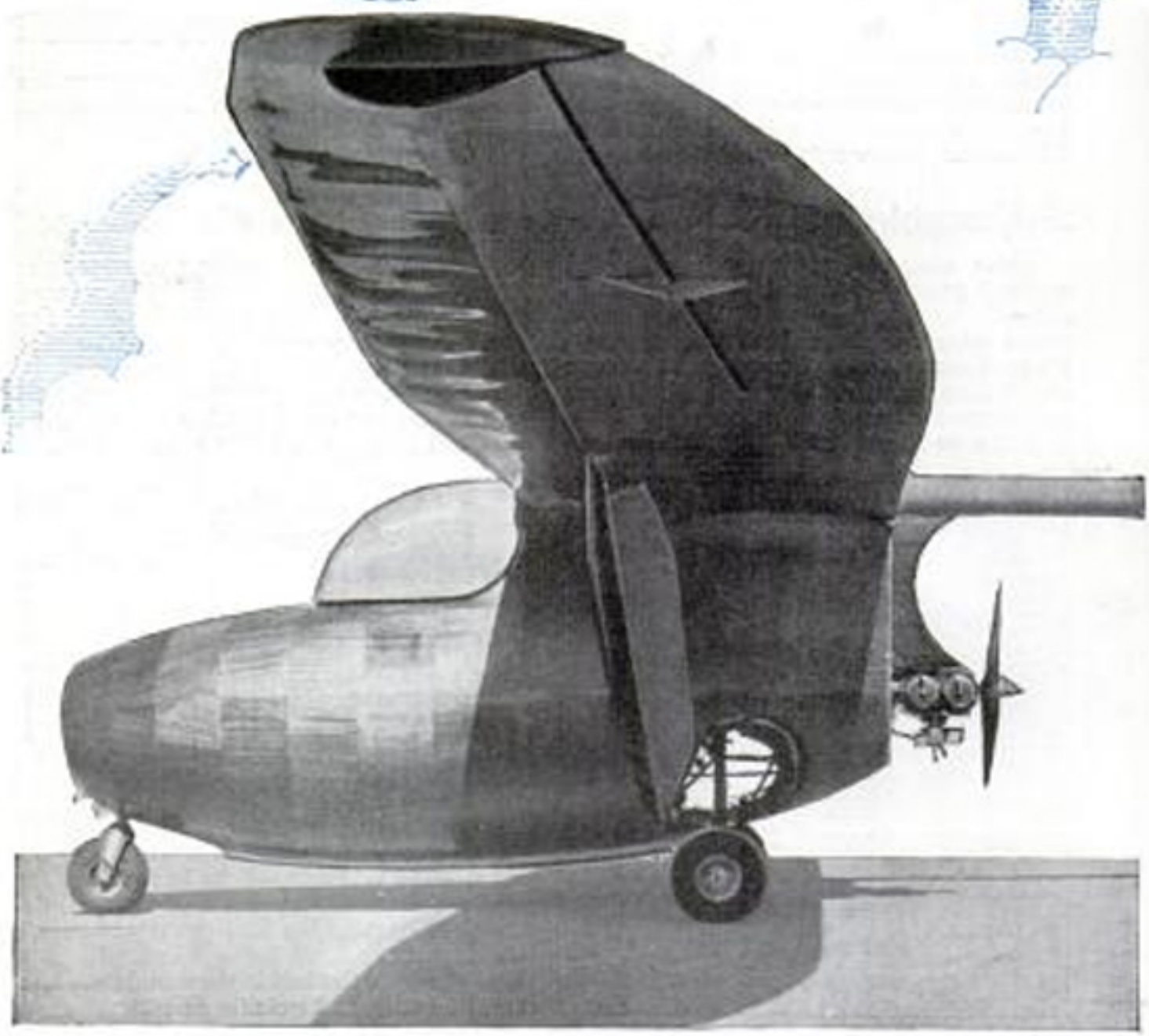
SAILORS are riding the heat waves above Elmira, N. Y., this month, intent on bringing to America some of the international records long held by European pilots of gliders and sailplanes.

This is the time of thermals, of cumulus clouds and warm updrafts along the hillsides of south central New York state, scene of the National Soaring Contests. More than 100 gliders and sailplanes and twice as many pilots are searching out air currents to give them a lift in a sport where motors are generally scorned.

Its military pilot-training program restricted after the first world war, Germany took to the air in sailplanes. Interest in America lagged, but now it is a growing hobby for men and women from the teens to the 70s.

A fraction the weight of an airplane and without its expensive engine, a glider can carry a man nearly 500 miles or gracefully ease him through clouds 20,000 feet high. A sailplane recently sped 37 miles at an average of 111 miles an hour. Add to this a comparatively low cost for the craft and no fuel expense or engine maintenance.

Such advantages are rapidly swelling the glider ranks. Many converts are young wartime airmen who've found even the light powered planes a notch beyond their civilian means, but who still want to enjoy



the thrills of flying. Many pilots recommend it for aviation training, pointing out that it gives the student confidence and a more intimate understanding of the art of flying.

The terms gliding and soaring are not interchangeable despite frequent misuse. Gliding is flying a motorless plane in a steady downward flight or glide. Soaring is an advanced form, using wind, heat currents, thermals and any energy of the atmosphere to prolong flight and gain altitude.

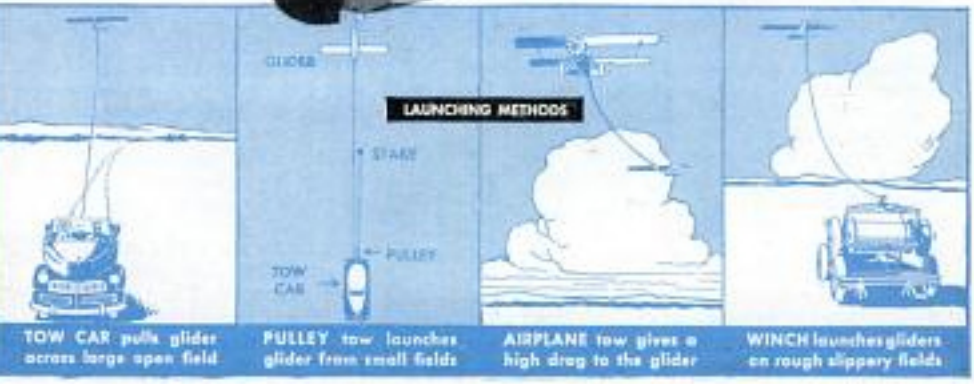
Primary gliders are comparatively crude

Drum of this winch revolves at constantly increasing speed to wind up towrope and launch the glider

H. A. Peuteor photos

View from cab of the winch just before the glider becomes airborne. Below, operator of winch has hand on the accelerator lever to increase speed

Latest development in gliders is this cabin craft with engine for power takeoffs

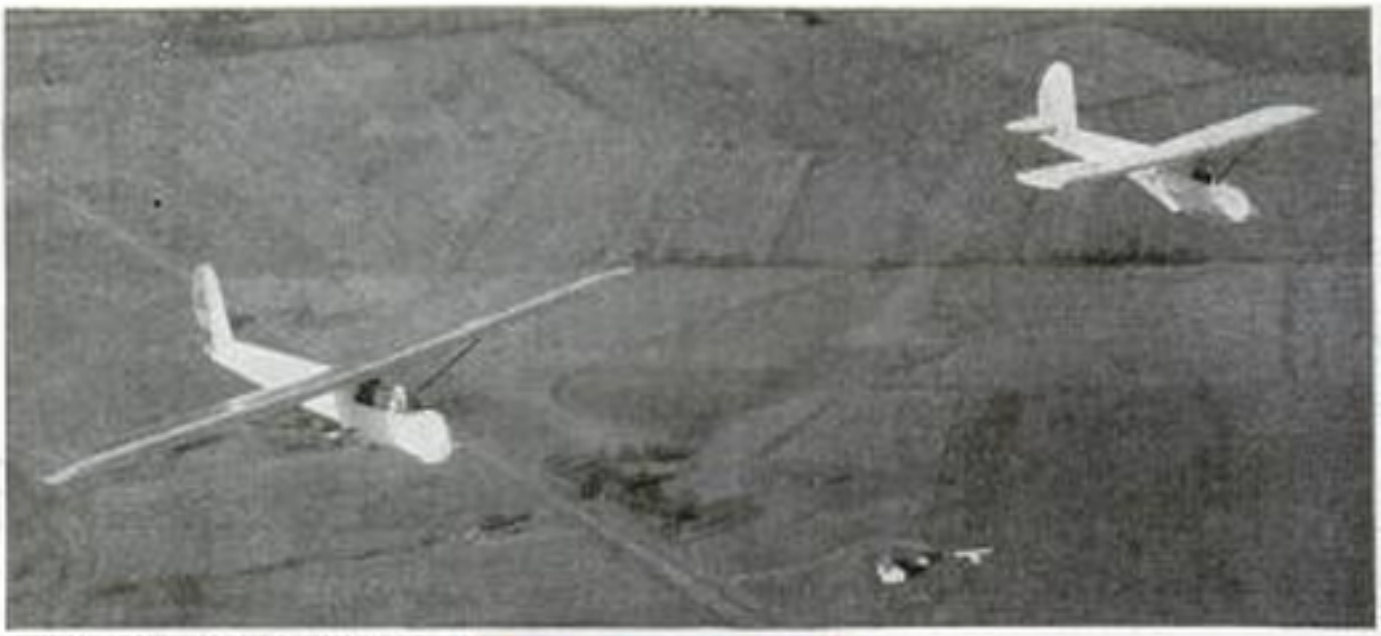


TOW CAR pulls glider across large open field

PULLEY tow launches glider from small fields

AIRPLANE tow gives a high drag to the glider

WINCH launches gliders on rough slippery fields



Schweizer Aircraft Corporation photo
↑ Left plane of these two ships is two-place sailplane, craft at right is glider

and simple, while the high-performance soaring or "sail" plane is streamlined and efficient. Between the extremes are utility gliders and intermediate sailplanes.

The average glider has a wingspan of 34 to 36 feet, weighs about 200 pounds empty and is built on a wooden skeleton. Sailplanes weigh 400 to 500 pounds and have a wingspan of more than 50 feet, almost twice that in some experimental models. Some are all-metal construction, all have enclosed cockpits.

Sailplanes have a higher stalling speed, 34 miles an hour in one new model, and a much slower sinking speed. They are much more sensitive to control than gliders. Primary gliders have no instruments, but a high-performance sailplane has an air-speed indicator, a climb indicator, an altimeter, turn-and-bank indicator, compass, thermometer and rubber-tired landing wheels with brakes.

Both types normally carry only one or two persons, though the military troop-carrying versions transported 20 or more fully-equipped soldiers. Conventional sailplanes and gliders are available either assembled or in kit form, with prices ranging from around $200 for a primary to several thousand for a top-flight sailplane.

← Pilots must be masters at finding these updrafts, avoiding down currents

A glider stays in the air principally because it has lift, which in turn depends on the speed of the craft and the size and shape of the wings. Glider designers are constantly working to increase wing efficiency, with the better wings carrying the glider farthest with the least descent.

In the sport's early days slope winds were relied on almost entirely for duration flights. As a result most of the sites were in hilly rolling country like that around Elmira, the "Glider Capital of America." As the understanding of thermals grew, however, gliding shook its dependence on topography. Now there are popular sites on the plains of Texas and Illinois, as well as in western mountain and desert areas.

Thermals, or air bumps, result from unequal heating of the earth's surface. For example, the sun's rays striking a plowed field are radiated directly into the atmosphere above. Since hot air rises, this air breaks away from the surface in the form of a series of thermal bubbles when sufficiently heated. They rise until their temperature reaches equilibrium with the atmosphere above.

Two-place sailplane sketched above has 52-foot wingspread. At upper right is one-place glider. Method of coasting up thermals is shown at right

Woods or water will not radiate as much heat as a plowed field. As a result, air above these areas will be relatively cooler and flow downward, creating a downdraft. By careful use of thermals, or upcurrents, and by dodging downdrafts, a pilot can maneuver to great heights and sail long distances. Good thermals are generally not found on windy days because the wind scatters the rising air currents.

Storm flying in towering cumulonimbus clouds has boosted sailplanes over 15,000 feet. Now pilots are studying dynamic soaring, using the difference in wind velocity at various altitudes to promote lift, as another possibility for sustaining flight.

In launching gliders the four towing

Utility glider soars in the wake of its tow plane
Schweizer Aircraft Corporation photo

Model of an 1883 glider struggles into the air during filming of a movie depicting life of early glider pilot

methods most generally used are the airplane, winch, auto and auto-pulley. The common towline is a strong manila rope several hundred feet long with metal rings at each end. Airplanes are used with the heaviest gliders or whenever a high tow is needed. The auto is most effective on a large field where there is a smooth path for the tow car, while the winch method is best on a rough or slippery launching area.

With the auto-pulley technique, the line is attached to a stake and threaded through a pulley at the rear of the car. The ring at the other end attaches to the glider. The auto-pulley works best on small, rough fields, or when wind velocity is low because the pulley doubles the speed of the glider. A wartime development, the flying "pickup" may prove especially valuable in cargo roles.

Development of a two-place soaring plane with a small auxiliary engine for takeoffs is exciting glider fans. Designed by William Hawley Bowlus, glider pioneer, the Bumblebee is built of plywood, with a hollow duralumin tail boom. A small propeller at the rear is driven by a 16-horsepower air-cooled 4-cylinder two-cycle engine. The glider takes off under its own power at 38 miles an hour and climbs 300 feet a minute. Once aloft, the engine is switched off and it performs like a glider.

The glider's controls are the elevators, rudder and ailerons. Up or down direction is achieved by tilting the elevators, which normally lie in a horizontal plane at the rear of the fuselage. When they are raised, the tail goes down and the nose up, or just the opposite when they are lowered.

Ailerons are the two horizontal surfaces hinged to the trailing edge of each wing. They operate like the elevators, except that when one is raised the other drops to lower the wing on the raised side. Both elevators and ailerons are operated by a control stick. The rudder is worked by a rudder bar or pedals. A push with the left foot, for example, turns the plane left.

Built primarily as an aerial freighter, this Army glider carries several tons
Official U. S. Army Air Force photo