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NOVEMBER  
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C.B.M.

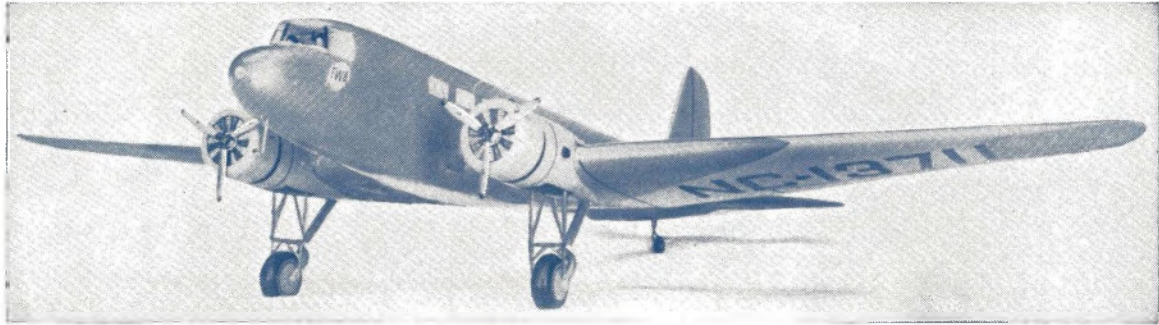
**ACTION TEST OF THE BOEING BOMBER**

**GRIPPING STORIES—THREE MOSQUITOES, PHINEAS, AND KERRY KEEN  
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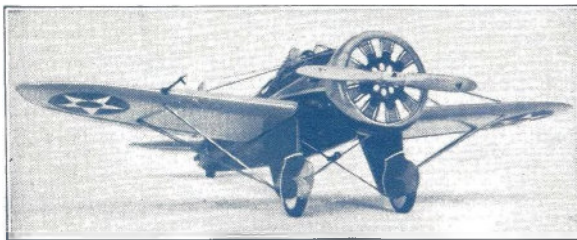
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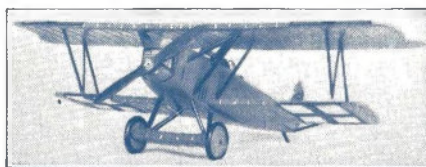
**BOEING P26A**



**CURTISS HAWK P.G.E.**



**SOPWITH CAMEL**



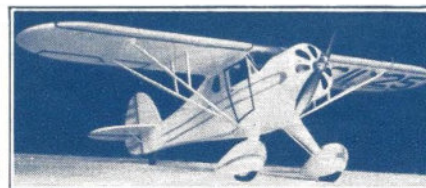
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**NOTE.** All pictures on this page are photographs of actual models.

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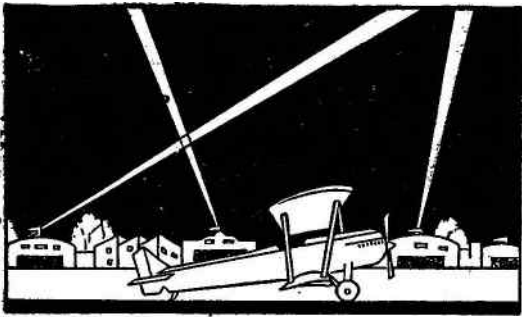
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# FLYING ACES

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VOLUME XXI

NOVEMBER, 1935

NUMBER 4

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Cover Painting by C. B. Mayshark

Published monthly by Magazine Publishers, Inc.; office of publication, 29 Worthington St., Springfield, Mass. A. A. Wyn, President; Warren A. Angel, Secretary-Treasurer. Editorial and executive offices, 67 W. 44th St., New York. Entered as second-class matter, Nov. 14, 1928, at Springfield, Mass., under Act of March 3, 1879. Title registered in U. S. Patent Office. Copyright, 1935, by Magazine Publishers, Inc. Nothing may be reprinted without permission of the publishers. Manuscripts will be handled with care, but this magazine assumes no responsibility for their safety. For advertising rates address FLYING ACES Magazine, 67 W. 44th St., New York City.

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# Secret of the Hell Hawks

Hunched over the controls, urging their hurtling Spads to the utmost, sat the Western Front's most celebrated trio of airmen. And in the gray Vincennes' field, still far ahead of them, stood a gaunt man—a man who held the secret of that ghastly Hun terror which had fallen on the foes of the Fatherland. At his back was a stake, and before him were lined eight armed men. And one of those eight had been very careful that his rifle did not carry that single blank cartridge.



Illustrated by E. M. Frandzen

## CHAPTER I

### FLIGHT WITH DEATH

AT dawn, the French military prison of Vincennes reared bleak and grim. Shrouded in mist, it had an almost medieval aspect, with its fortresslike buildings of stone, its massive walls.

Dawn was not welcome to the inmates of Vincennes—condemned spies and traitors of France. For invariably, stalking in the dawn's chill mantle, came death.

Even now, in one of the musty, candle-lit cells, a wretched man stood clinging to the bars and peering out at the dawning sky. He was a Frenchman, this doomed prisoner, elderly and gray-bearded, with mild Gallic features that looked incapable of any crime, and with a body that seemed frail beneath its baggy prison shirt and trousers.

His eyes were peering with flickering hope into the east. His back turned to the other two occupants of the cell—a black-robed priest and a trim, blue-clad colonel whose alert foxlike face stamped him as an officer of the *Deuxieme*, France's great Intelligence Corps.

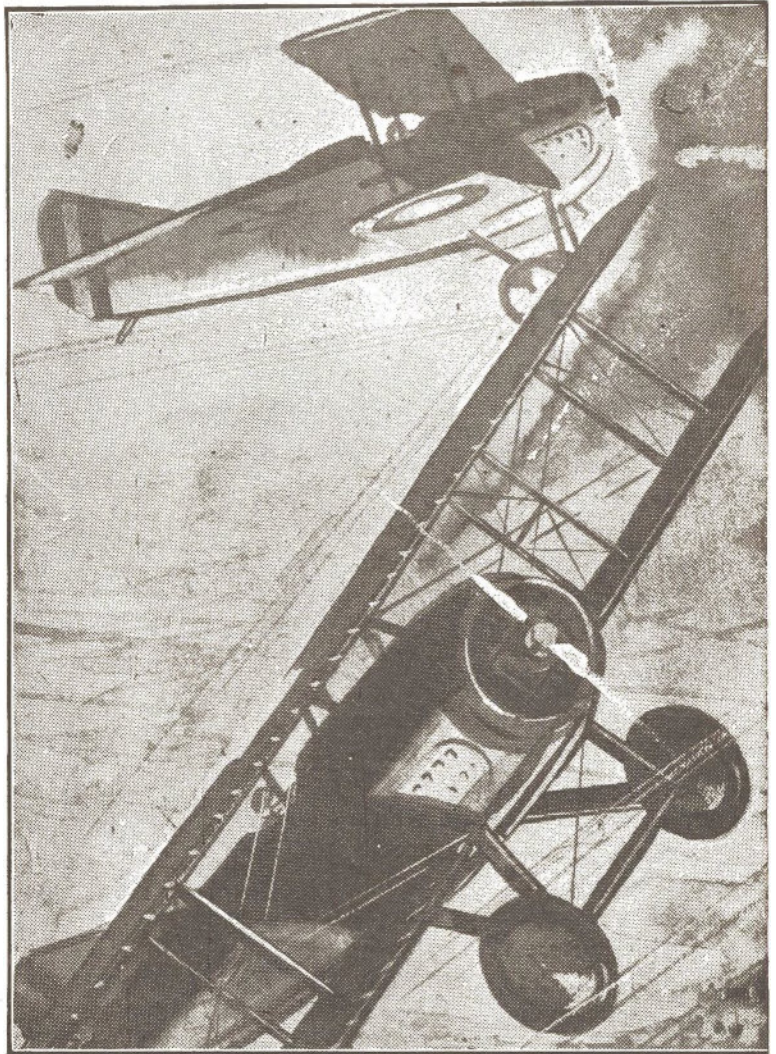
The colonel was talking crisply: "Emil Rodet, have you nothing to say before you are led to your execution?"

The old Frenchman did not move from the window. His voice was toneless. "I have nothing to say."

"Come, you have already admitted, Rodet, that you forged that military order which launched a British-French drive in the Somme sector—a drive which, because of the overwhelming enemy there, was suicidal. You have admitted that you owned property in the Somme, and that, avariciously, you caused the drive in the hope of regaining your land. And now, before you die, will you not try to undo some of the damage by answering our other question?" Suddenly his arm shot forward, gripping the Frenchman's frail shoulder. "Who is von Bergsten?"

A slight stiffening in the prisoner's back was the only indication that the name meant anything to him. But without turning he shook his head.

"Come!" the colonel urged crisply. "We know a famous German scientist named von Bergsten died several



Suddenly a ghastly group of rocket-shaped craft hurtled below them with a speed that sent an inhuman wail through the air. The next instant, a terrific cataclysm rent the sky and what a moment before had been a French village was now a flaming ruin of hell.

years ago. We also know you have communicated by a government wireless with a von Bergsten. We intercepted your code message, asking for a truce-meeting with this Boche. Emil Rodet, what is between you and this von Bergsten? What bargain were you going to drive with our enemies? Speak!"

But the old prisoner only looked more desperately at the eastern sky, now showing the first ruddy flush of the sun.

"I have—nothing—to—say."

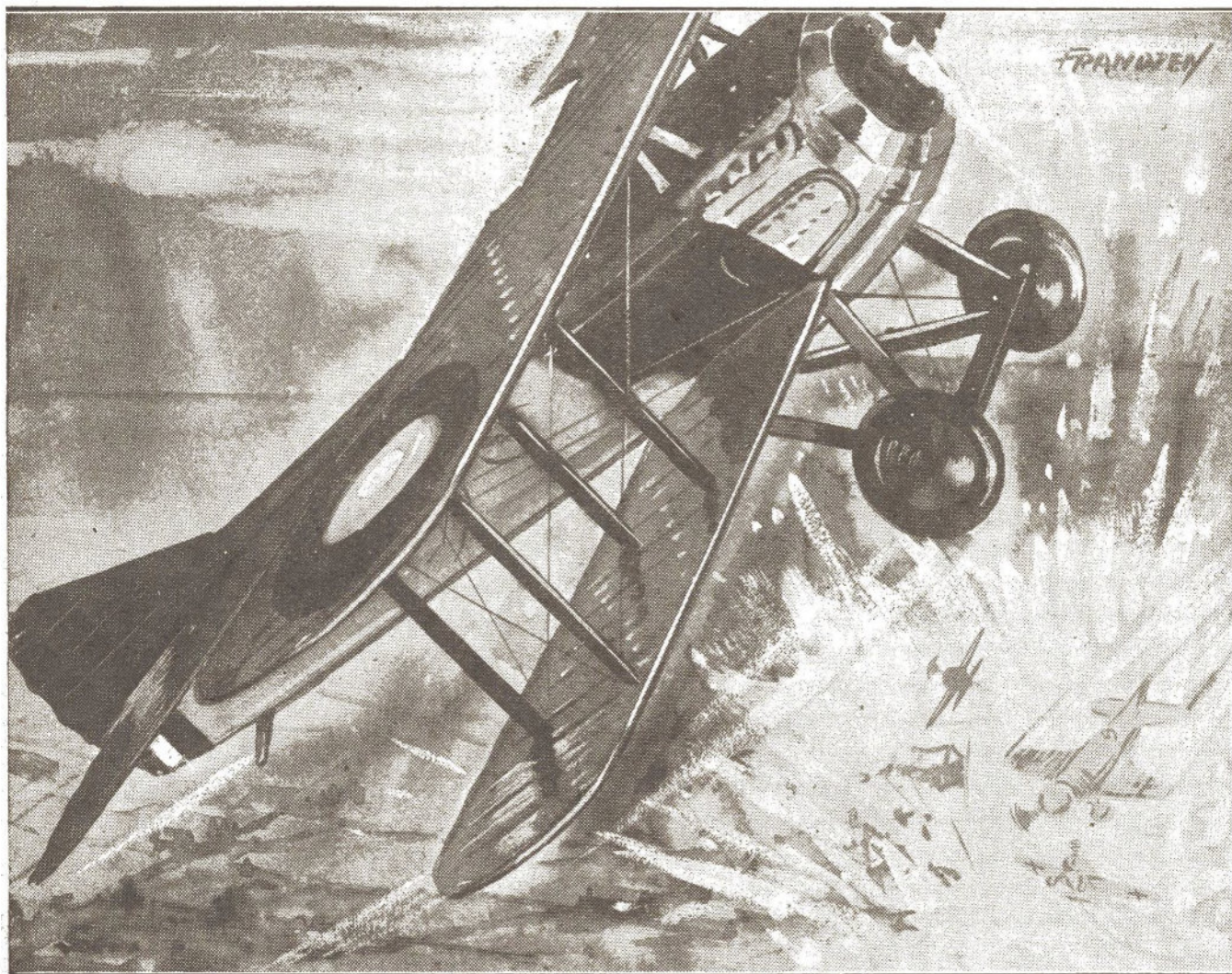
The colonel shrugged, turned away. He went to the door, spoke a command, and the door was opened from outside. From the corridor came the grim tramp of boots, the clink of rifles. The priest moved close to the prisoner, his lips beginning the litany. Led by a blue-clad *capitaine*, a squad of eight *poilus* gathered just outside the open door.

"Come, Emil Rodet," the priest murmured. "It is time."

The prisoner was loath to stop peering at the sky. But at length, moving as if in a trance, he obeyed, was walking out beside the priest. The squad formed around him. Grim and funereal, the procession started down

# SENSATIONAL "THREE MOSQUITOES" MYSTERY NOVEL

By Ralph Oppenheim



the corridor. The colonel of the *Deuxieme* was following in the rear when suddenly he was overtaken by a hurrying, white-faced lieutenant.

"*Mon Colonel*, here you are; I could not find you!" the lieutenant's voice was shrill, and his eyes showed panic. "I came to report to you that the Hell Hawks have struck again!"

The colonel's face went taut; horror had come into his keen eyes. And that horror was reflected on the faces of the eight marching *poilus*, for in the echoing corridor the lieutenant's shrill voice had carried to every ear.

And strangest of all was the effect on the shuffling old prisoner. Where he had been listless and indifferent, he now seemed to go tense in every muscle of his frail body. An ashen look, as of intolerable anguish, came over his bearded face.

"The military supply depot at Clouey—wiped out, without a single survivor!" the lieutenant was shrilling out now. "Road Seven, strafed—a hundred infantry slaughtered! They will destroy us all if this continues! At the last report, the Hell Hawks were believed headed for the town of Luennes—that is only twenty kilometers from Paris!"

The colonel seemed to pull himself together with an effort. "Go back to headquarters," he ordered harshly. "Keep all lines of communication open. Warn Luennes.

I'll be back as soon as I can."

And as the lieutenant dashed off, the Colonel, with the air of a man impatient to finish a chore, fell into step behind the firing squad—headed for the exit of the corridor with their prisoner, who once more was slumped and lethargic.

**I**N the sky, dawn comes earlier than on the ground. Darkness still shrouded the earth below, when, racing through the mists, three Spads hurtled at breakneck speed, their wings rocking, their Hissos thundering at full throttle.

The three Spads flew in a V formation, so precise that they seemed as one. On their trim khaki fuselages, visible in the dawn light, were three identical insignias—each a huge, black-painted picture of a grim-looking mosquito.

And in the cockpits of the three racing crates, hunched to the controls, sat the most celebrated trio of airmen ever to blaze their way through overwhelming odds and live to laugh about it—the trio known as the "Three Mosquitoes."

Captain Kirby, their impetuous young leader, flew at point as always, picking the hasty course by compass, map, and the blurred landmarks in the murk five thousand feet below. On his right flew "Shorty" Carn, the

(Continued on page 55)

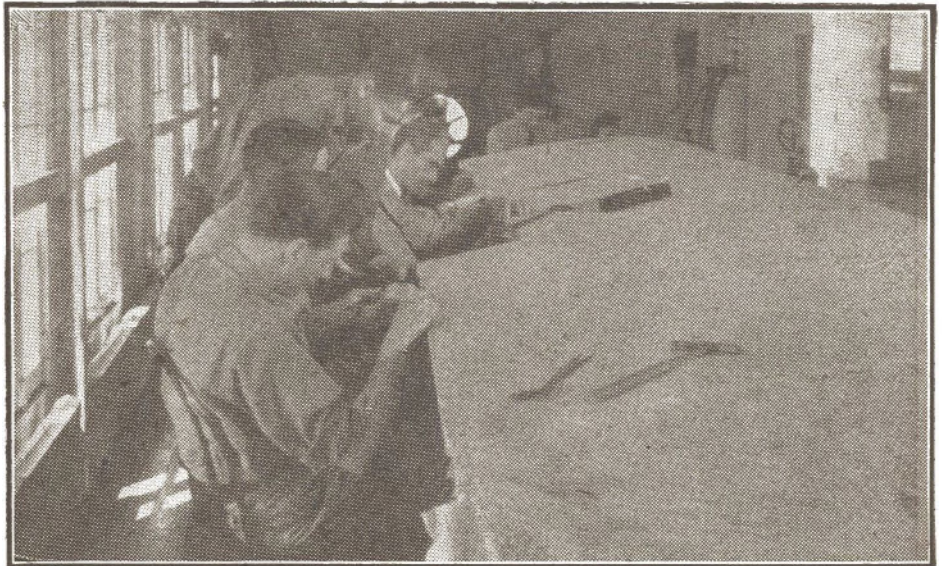
# So You Want to Fly

WELL, HERE'S  
WHAT YOU  
MUST DO  
TO WIN YOUR  
WINGS

By Lieutenant  
H. Latané Lewis II

3rd Corps Area Service Command,  
U.S. Army.

Author of "Aircraft of Tomorrow,"  
"Pursuit Aviation Today," etc.



A student flying officer not only must thoroughly understand every part of his plane, but he must know its assembly from prop boss to rudder. These Navy air cadets are at work in the Pensacola fabric shop covering a wing. Steady now, with those scissors and needles!

★ ★ ★

**Y**OU'D like to become an Army pilot? You want to fly those sleek high-powered P-26's in tight formation, in screaming power dives, through dizzy aerobatics?

Or is it the gold wings of a Naval Aviator to which you aspire? Maybe you are hankering after flying Boeings and Grummans off the smooth, teakwood deck of a carrier to maneuver over the fleet's long line of steaming greyhounds far below.

Well, Uncle Sam is training hundreds of young men every year to do those very things. And there is no

reason why you can't be one of them—if you've got what it takes. But don't get the idea that the road to a commission is like walking through a field of clover.

First, let's consider the Army and see what you have to do for a chance to go through its West Point of the Air—generally recognized as the finest flying school anywhere in the world. This air college is known officially as the Air Corps Training Center and is composed of a primary school at Randolph Field and an advanced school at Kelly Field. Both outfits are located at San Antonio, Texas, where there are more sunny days a year than in Hollywood.

If you are an unmarried male citizen of the United States, between the ages of 20 and 28, you may make application to the Adjutant General of the Army, at Washington, for appointment as a flying cadet. (You may write to the Adjutant General, incidentally, for a little booklet entitled, "Flying Cadets of the Army Air Corps.")

The first hurdle you'll have to leap is education. Two years in a recognized college—or the equivalent—is required as a minimum; but you'll stand a better chance of having your application accepted if you are a college graduate. Moreover, engineering training is a big asset. If you haven't been to college, you can take an examination to prove you have equivalent training. You will be asked to answer questions on trigonometry, geometry, algebra, physics, geography, history, grammar, etcetera.

Next you'll have to take the physical examination. Since these exams are given at nearly all of the Air Corps fields scattered around the country, you will be told to report to the field nearest you. The physical is the biggest stumbling block in the whole procedure and a high percentage of applicants are "washed out" on it. Last year, of the 1,587 men who took it, only 321 of them were able to qualify. But that is something you never can tell about, until you've taken the examination. It isn't simply physical perfection that will get you by. Most of the graduates of West Point are a pretty fine lot of men physically, yet I am told that only about 25 per cent can make the grade when the flight surgeons



Official Photograph, U.S. Army Air Corps.

This Army fledgling (right) is getting final instructions before his first hop in a primary trainer. "You're to do it like this," the instructor is saying—and the stude is wisely drinking in every word.



# For Your Uncle Sam!



Official Photograph, U.S. Army Air Corps.

**Dit-dit-da-dit!** These Army flying cadets, attending the radio class at Randolph Field, Texas, are "taking dictation" from their instructors at the desk in the rear. They write down what they hear—and they've got to hear right.

look them over. On the other hand, some of the highest scores are made by flat-chested, little fellows who never did anything more strenuous in their lives than dodge taxis on city streets. The answer to this one is what the flight surgeons call "inherent flying ability." Mother Nature either gave it to you when she put you into this world, or she left you without it. And there is nothing you can do to develop it if you weren't born with it.

Tests for commercial pilots are much less strict, but military flying calls for something more than just pushing a crate around the sky. The Army pilot must have instantaneous coordination of eye and muscle so that the details of handling his plane become instinctive while he centers his attention on other planes in the formation, on an enemy's movements, on his guns, or any of a dozen other things.

To find how you're put together, they put you through some queer stunts in the physical examination. When they psycho-analyze you, they'll ask plenty of personal questions.

**SUPPOSE** you're one of the select few who do get a medical O.K. You may have to wait a few months, or in some cases even a few years, before reporting for duty, because there will be a lot of qualified men already ahead of you on the list. And there are certain priorities given enlisted men in the regular Army, graduates of Reserve Officers Training Corps units, members of the National Guard, etcetera.

But sooner or later, the War Department's official envelope will arrive bearing your appointment as flying cadet and ordering you to report to the Commanding Officer, Randolph Field. New classes begin on March 1st, July 1st, and October 15th of each year. You will be given a free railroad ticket and when at last you walk up to the Administration Building with the good old stars and stripes fluttering from its dome, you will be starting on a new existence, full of thrills and adventure. But the oath of allegiance, in which you pledge

No matter which air service you're aiming for — Army, Navy, or Marine Corps—you'll have to have plenty of "what it takes," both mentally and physically. But if you buckle down to work on your education, and at the same time keep fit, you'll stand a good chance of becoming a cadet and winning your commission.

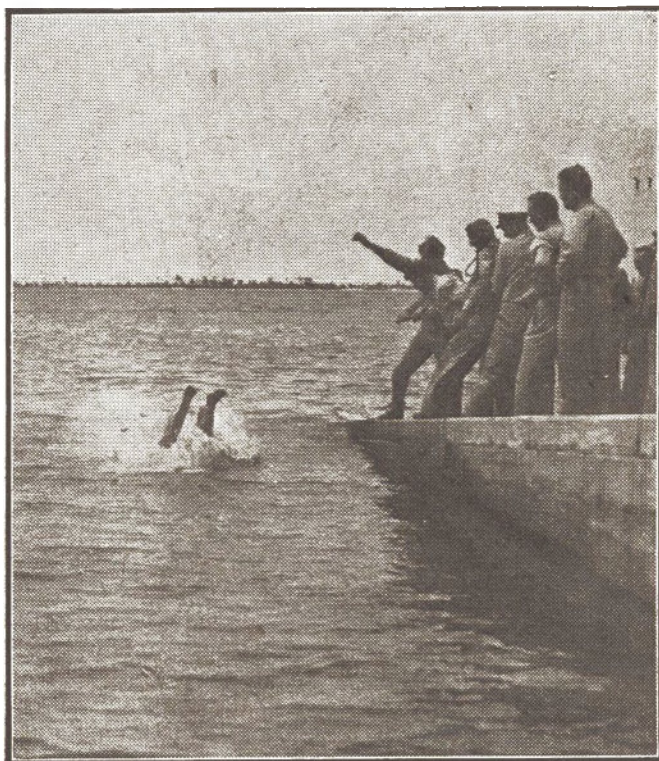
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yourself to defend the United States against all enemies, makes you realize that military life is a serious business.

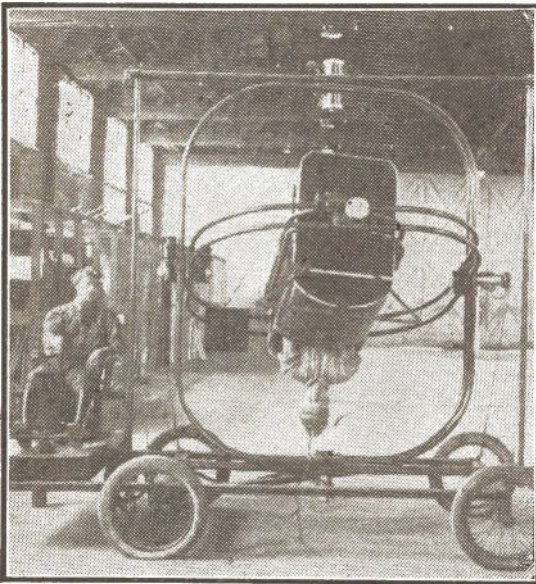
Serious though it is, you'll have a lot of fun at Randolph. All cadets are required to take part in athletics and various teams are formed for competition, just as at

college. The discipline is iron-clad, with upper classmen hazing the dodoes, or lower classmen. And how easily those demerits pile up! Unshined shoes, poorly made beds, and a score of other seemingly trivial things will chalk up the "gigs" against you. Then there'll be blistering hours under the sun with a heavy service rifle on your shoulder walking them off.

The course at Randolph lasts eight months and is

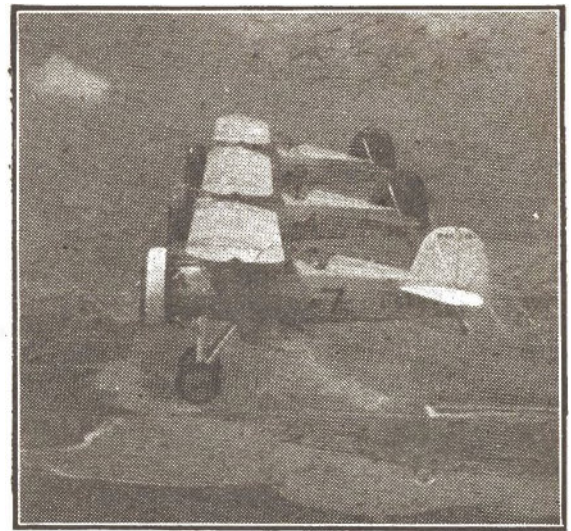


**Ker-plunk!** At Pensacola, after you solo in the air, you solo in the water! It's a time honored custom engineered by your fellow students. Even a Lieutenant Commander "took it" not long ago.



Official Photograph, U.S. Army Air Corps.

Left: You've all heard of the Rugles Orientator. If you can orient yourself after the instructor shows you all the corners of the hangar from this flying-cockpit—then you're ready for the next step in training.



And now for the air! Here's three Navy fledglings, from Pensacola, practicing fighting maneuvers. You'd think those Boeing F4B1's had been lined up with a ruler!

divided into Primary and Basic stages, each of four months duration. During the primary stage, students fly primary training planes; and the probability of a student's successfully completing the entire flying course generally hinges upon the progress he makes during these first four months. The primary ship generally used now is the PT-3, a Consolidated Trainer with Whirlwind engine. Ground school classes are sandwiched in between the flying, and there is a lot of real work to be done on such subjects as Military Courtesy, Military Law, Theory of Flight, Theory of Radio, Navigation, Meteorology, Instruments, Motors, Machine Guns, Theory of Photography, Military Sketching and Map Reading, *ad infinitum*.

After you have thoroughly mastered the primary type ship, you are assigned to the Basic Stage, where you

fly the basic training plane. At present this is the BT-2, a Douglas observation plane with Wasp 425 h.p. engine. This ship, whose controls are more delicate than are those of the PT's, serves as the medium of transition to the regular service type airplanes which are used at Kelly. To jump directly from a PT to a P-26 without anything in between would have the undertakers working overtime.

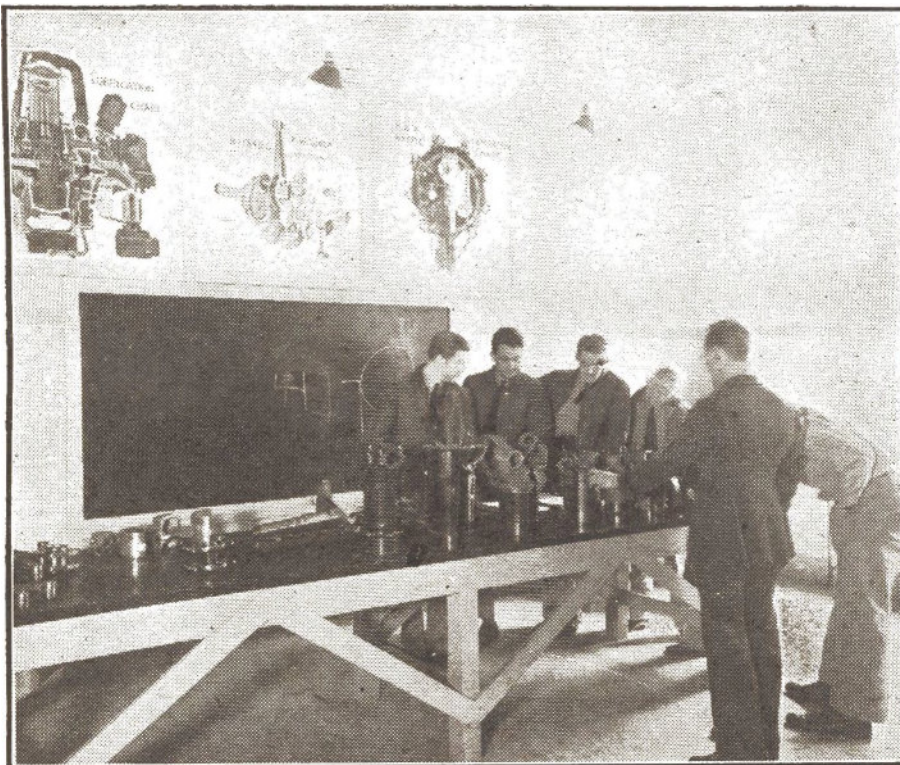
When your second four months are up and you graduate from Randolph with 152 hours in your log, you are sent to Kelly where you fly service ships with the tactical squadrons of the regular Air Corps. You are assigned to one of the four branches of military aviation—pursuit, bombardment, observation, or attack.

Here, you spend another four months and get an additional 113 hours in the air, consisting of formation flying, aerobatics, cross countries, target practice—and steep dives with the engine wide open, standing on the rudder pedals, and watching your tracers rip into a sleeve target towed behind another plane.

Soon, all the rough edges in your flying technique will be ironed out and you'll be ready for the big day—graduation. The Chief of the Air Corps will probably be there to pin the coveted silver wings on your left breast. And no matter how hardboiled you are, your pulse will quicken with the realization that you are now an Army pilot!

Next, there'll be a year's active duty with one of the regular Air Corps squadrons—in all probability with the GHQ air force—continuing your status as a flying cadet. Flying cadets receive \$75 per month, \$1 per day subsistence allowance, a clothing allowance, and their living quarters free of charge. At the completion of this year, you will be commissioned a 2nd Lieutenant in the Air Corps Reserve and given a year's active duty as an officer. Your pay will now be about \$187 per month. At the termina-

(Continued on page 85)



Here, we're looking in on a class in engine instruction at the Navy's Pensacola ground school. Before they jot "O.K." after your name, you've got to know all the "hows" and "whys" of a motor's "tick."

# Action Test of the Boeing Bomber

THRILLING STORY BEHIND THIS MONTH'S COVER

\*\*\*

By C. B. Mayshark

**O**VER the distant horizon, a speck suddenly becomes visible from the housetops of a teeming industrial city. As if by magic, the speck grows in size, finally taking on gigantic proportions. Crowds in the streets are attracted, all eyes are turned heavenward. And now the aerial monster—the new Boeing Bomber—hurtles over the city at more than 250 miles per hour! This giant, powered by four Pratt & Whitney engines, is the newest thing in the air—the latest marvel of an age which already boasts innumerable mechanical wonders.

Suddenly, the local airport is alive with activity. Three brand new Navy Northrops are speedily rolled from a hangar. Commands are curtly barked, starters whine, and the deafening roar of three powerful engines pervades the air. The single-seaters are off the ground with a leap; and once in the air, they head in Vee formation toward the circling bomber. Their job is a test attack on the immense ship before them. They must attempt, theoretically, to send it to destruction.

Will they be returned the victors? Will the Boeing Bomber, in supposition, go “down in flames?” Will the years of research and toil be written off as short of the goal?

In short, were the designers fully warranted in making this new swing in military aviation? At this writing, the answer seems to be an emphatic “Yes!” To begin with, the argument is advanced that the days of the single-seater hero pilot are gone forever. Already there are indications that present day single-seater squadrons may become somewhat outmoded before the advance of fast and powerful two- and three-seater attack jobs. This fact gives credence to the growing acceptance, in military circles, of the large capacity, long-range bomber, of which the new Boeing is the acme.

Of course, we all know of the romance and spirit of adventure which characterized the fighting of the daring war-time pilots. In those days it was generally a case of man against man. But today things are different. There are those who declare that single-seaters have little chance against a four-engined giant with five gun platforms—a ship which cruises at better than 250 m.p.h. The present day fighters of less speed would, of course, have difficulty in getting within range. As for the faster fighters, it may be pointed out that it takes plenty of skill to hit a fast moving ship; and when you are forced to zig-zag and literally throw yourself all over the sky in order to escape burst after burst of withering fire from such a formidable flying fortress—it requires more than skill!

However, in spite of what the experts think, and in spite of what the consensus is among those who think they are experts, the new Boeing Bomber must be put

to test. A violent encounter must be simulated.

And so, the Northrops appear on the scene. One of the finest single-seater types in the world, they are fast, powerful, highly maneuverable. If anything can get near the Boeing Bomber, the Northrop can.

Coming upon the bomber from behind, they spread out fan-wise as soon as the first warning burst of tracer sprays the air about them. One Northrop climbs, another maintains its position, and the other dives. Attack the ship from more than one angle! Close in on it! Throw tracer from all directions! Those are the accepted tactics.

But the Northrop pilots soon find their task difficult. The Boeing Bomber cannot safely be approached from any angle. It is protected from above by a turret along the top of the fuselage. A “bird cage” gun emplacement protects the nose of the ship. Moreover, guns bristle from “blister” turrets on both sides and belly of the bomber’s fuselage. There are no blind spots!

The gunners aboard the Boeing are wide awake to every movement of the Northrops. But even so, their task, too, is not the simplest one in the world. The shifty little Northrops are giving them the fight of their lives. But finally, the hugh bomber prevails.

**A**ND so, the Boeing theoretically is successful in bombing the industrial center it has attacked. True, the city is also protected by anti-aircraft defenses. But the speed at which the Boeing flies makes one sceptical as to the success of such fire. And this brings up an interesting question: Have anti-aircraft developments kept pace with plane developments? A city is a huge target for a bomber speeding at high altitudes—but to gunners on the ground the bomber is, of course, a very small and highly-elusive object. While we’ve heard rumors of super-effective anti-aircraft pieces, the powers that be have thus far kept such inventions well veiled.

As for our Northrops, they now land, and the pilots climb wearily from their cockpits, haggard, exhausted. They have been through an ordeal.

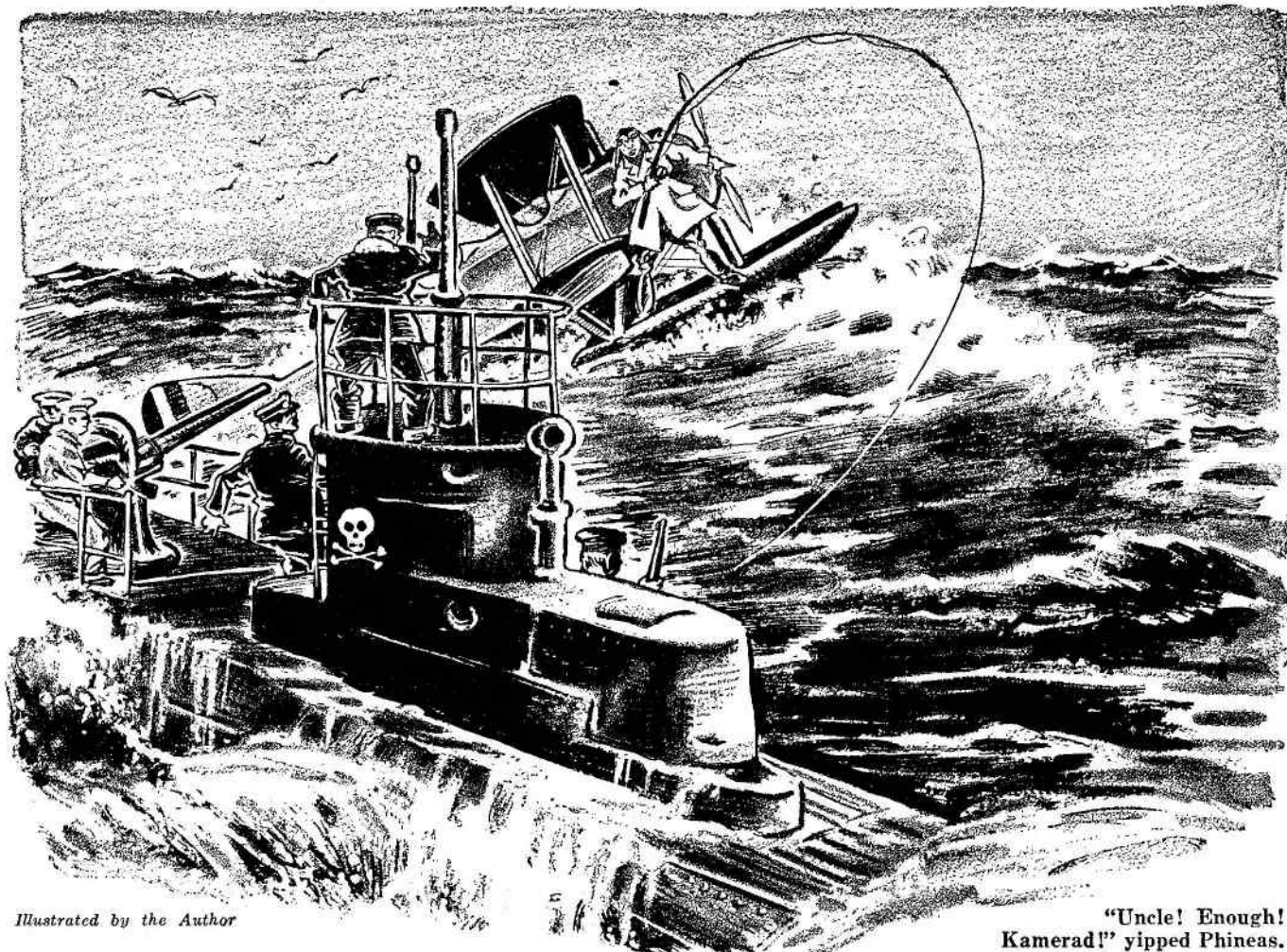
The tight turns and steep power dives have told upon them; for the tricky maneuvering in the hurtling fighters of the present day exerts a terrific strain upon the body.

Of course, the air battle pictured on our cover is entirely fictitious. Our purpose has simply been to help you visualize the new Boeing Bomber in a real air scrap. If such a test takes place, there will be a board of judges to render a verdict as to the outcome. Blank cartridges or camera guns will be substituted for bullets.

Performance figures of the new Boeing have not been released. At this writing, its top speed is a matter of conjecture. Your guess is as good as ours.

**Build a Model  
of the Boeing Bomber!**

*See Page 40*



Illustrated by the Author

"Uncle! Enough! Kamerad!" yipped Phineas.

# Sea Gullible

ROLLICKING "PHINEAS" ROAR

By Joe Archibald

Author of "One Hun, One Hit, Three Errors," "Pfalz Teeth," etc.

**L**IEUTENANT Phineas Pinkham walked jauntily into the Frog farmhouse which housed the Operations office of the Ninth Pursuit Squadron, tossed a

package of cigarettes to Bump Gillis, his hutmate, and continued on his way to beard the lion in his den.

"I hope he has been fed well today," he grinned, swinging open the sacred portals. "Uh—good afternoon, sir. What're the chances of rain *ce apres* midday?"

Major Rufus Garrity pulled his facial muscles all out of shape, swore roundly, and leaped up from his chair.

"I would say, you homely hybrid," he ripped out, "that they are maybe ten million times better than your chances of getting two weeks leave. I hope I make myself clear!"

"It is a caution how you read my mind," Phineas said blandly. "Well—good day. I will try again, sir. You can see how much I need a change. I am all run

Phineas goes down to the sea in ships—A Spad and a Short. The Boonetown Bamboozler wanted to knock off work and go fishing. But fishing in the Short proved short, and instead of knocking off work he knocked off a submarine.

down. I stuck my finger with a pin this a.m. and no red corpuscles fell out. I must see a medico as—"

"Tell him to start in on your skull and work down," the Old Man

snapped. "He'll have found the trouble before he gets to your tonsils. Get out of here!"

"I never have thought you especially funny," retorted the object of the Major's wrath, walking out with his nose in the air.

"Well, where are you going?" Captain Howell of "A" Flight chirped as Phineas joined the little group of pilots at the mess table. "Nice, Baden-Baden, or Monte Carlo? Ha ha!"

"I'll be leavin' in about two weeks," the pilot from Boonetown, Iowa, snapped. "If any of you bums would like to lay a franc or two in advance that says I won't—well—"

"I'll start with ten," Bump Gillis cut in fast. "Here!"

"I've got twenty."

"Make it fifteen for me."

"Odds of five to one is my terms," Phineas announced.

"Is it a bargain?" The trio nodded assent.

"Let's see now," he calculated, "that'll make two hundred an' twenty-five francs to defray my expenses. Well, adoo for now, bums, and *merci* very much. Haw-w-w-w! You will never learn!"

As Bump Gillis reached the door of the farmhouse the burning cigarette that hung loosely from his lips hissed like a python with three heads. The Scot let out a yelp and went over backwards, chair and all. When he got to his hands and knees the end of his nose was a mite broiled.

"Just a li'l black powder," explained Phineas. "Now I bet you'll stop bummin' smokes, you nickel nurser."

"I ain't goin' to stand it much longer," Lieutenant Gillis raved. "You will push me too far, you—"

"Let's get him *now*," Captain Howell suggested. "We—"

"I wouldn't git up too fast if I was you," the squadron jokester cautioned his flight leader. "That is swell glue on the seat of that chair. Well, adoo, bums!" He sallied out, humming a scrap of the *Marsellaise*. "If they had any brains," he chuckled as he headed for the Gillis-Pinkham hut, "they'd cut them odds down. Haw-w-w-w-w-w!"

In his cubicle, Phineas dug down into his trunk and pulled out a pasteboard box. Removing the cover, he took an inventory of several round objects that had all the identification marks of onions.

"Boy! Them trick factories sure can fool guys," he grinned as he picked a bogus onion from the box. He looked out of the window. Twenty yards away a contented Frog cow, evidently strayed from a neighboring farm, was nibbling succulent grass roots under an apple tree. Several moments passed. The cow raised her head and sniffed at the ozone. Phineas had never seen a funnier expression on Major Rufus Garrity's face than that which appeared on the bovine countenance. The animal stopped moving its jaws as if its cud had abruptly gone sour. Suddenly it mooded and started to run, describing a wide Immelmann over the landscape.

"I giss they'll do," the Pinkham scion mused as he got himself ready for the last patrol. He knew it was to be a boring one. Since knocking off von Bountz, Phineas had found the war in the air in a state of stagnation. "It looks like they are barren of barons," he commented, pulling on his coat. "Well, I'll go over for the ride anyway, haw-w-w-w-w!"

None of the pilots spoke to Phineas as he came out to the line of Spads. When Captain Howell stooped to pick up a glove he had dropped, the master of tricks observed that part of the cane seat of a chair was still sticking to him. Bump Gillis' prop boss carried an application of gooev salve.

"Awright, awright, stay mad!" Phineas piped up in a rich falsetto voice. He daintily placed a hand on his hip. "See if I care! I will not give you that peachy dress pattern I promised you—so there!"

"Gimme that wrench!" Bump Gillis exploded to a mechanic.

Pinkham ducked. The spanner whizzed by his head. Major Garrity zoomed three feet into the air as it came for his undercarriage. The wrench skimmed under his boot soles with but the thickness of a cigarette paper to spare.

"Who did that?" he bellowed. "Who tried to kill me? Stop right there! I—"

"I ain't tellin'," Phineas said as he legged into his Spad. "But it wasn't me, Howell, Wilson, or Brooks. So you can just guess!"

"Ah—er. It slipped," Lieutenant Gillis said weakly. "I was tightenin' a nut—an'—"

THE C.O. was still swearing when "A" Flight arrived back at the field. One look at the crates convinced him that they had met up with something worse than floating balls of cotton in the scraposphere.

"Didn't anything miss you?" he yelled at Howell.

"Huh?" the Flight Leader was irritable. "Not unless it was you, Major."

Then Phineas came up, dragging an aileron. "I claim a record," he said. "I landed a Spad without a tonsil clicking, without an empennage or rudderbar. Three struts are gone an'—"

"Shut up!"

"The krauts have rounded up all of Richthofen's relatives and have taught 'em how to fly," Captain Howell declared. "I bet there were seven barons in that flight of Albatross crates."

"It's all on account of me," grinned Phineas. "Huh—er—I wish you would reconsider about my furlough, Major, as—er—excuse me, I ain't myself!" He yanked off his helmet and was kneading it into a ball as he hastened to his hut.

"It's a swell idea," he chuckled once inside the cubicle. He plumbed the depths of his trunk and came forth with a big box of makeup. From it he produced a strange object which he spread out on the back of his hand. A casual observer would have sworn that the pilot from Iowa had given his hand quite a gash.

"I don't know how the bums do it!" he enthused. "They could make an egg that a robin would sit on for a year. I'm glad I had my hair cut short. This bogus scar will go swell pasted on the side of my head."

Having applied the amazing bit of makeup, Phineas wrapped a piece of cloth around his head to keep it secure until the glue had dried. But everything was not complete. The miracle man reached for his flying helmet and

laid it on the table. A few moments later a shot rang out. Phineas was examining the bullet slice in the leather when a groundman stuck his head in through the door.

"I was passin' by," he said. "I hoped—ah—er—wondered if you'd shot yourself, sir."

"Carry on!" Phineas yipped. "Otherwise I will have you put under arrest for insultin' an officer. You hoped! It's awful the lack of respect around here for officers."

When he was alone again, the schemer did a bit of soliloquizing. "I'll just bide my time, that's it. Let's see—two hundred an' twenty-five francs—huh—well—hmm!" When Bump Gillis ambled in and flopped down on his cot, Phineas was flipping the pages of a book.

"This is a travel advertisement folder," he explained.



The Frog cow mooded and started running.

"It's a fancy job. Show's pictures all in color of the Channel scenery, the coast of Holland and Germany. I think I'll travel when—"

"My Gawd, what ails your dome?" Bump Gillis tossed out testily.

"Haw-w-w-w!" said his hut-mate. "It's my hair. I just washed it an' can't do a thing with it. Why—er—here comes company! It's some brass hats. Somethin' always happens to spoil a guy's appetite. Right at mess time they show up. I bet they are Scotch generals."

The brass hats were still in the Frog farmhouse when the pilots trickled in to the Squadron festive board. Garrity squinted at the bandage on Phineas Pinkham's head and immediately blasted out a query as to what was the idea.

"Oh, I just got nicked upstairs," Phineas responded carelessly. "I don't think it's much. Haw-w-w-w!"

"Damn' grave situation," a Colonel was concluding, though no one seemed to be paying much attention. "That U-boat is sinking everything that comes across the Channel. Nothing can stop it, Garrity. There's a skull and crossbones painted on the conning tower. The allies call that tin fish commander 'Kapitan Poison.'"

"It makes no sense to me," Phineas proffered his opinion. "Worryin' about submarines on an airdrome. I bet you would end it all if you was a lumber king and the bottom fell out of the herring industry. Haw-w-w!"

"Major!" the Colonel spouted from a purpling face. "What—spt-t-t-t—who—by gad, sir, that fresh, impudent—what kind of discipline is this? Didn't you ever tell him that there's such a thing as a superior officer?"

Sir Rufus groaned. "Yes, Colonel," he sighed, "a million times, no less. But he just won't believe it. Now you were saying—?"

"That sub," the Colonel growled. "The Allied navy will have to do something. Two days ago it sunk a ship carrying eight British pilots bound for this front. Has that anything to do with the Air Force, eh what? Lucky they were all saved—"

"I knew it was too good to be true," Phineas moaned and dug a fork into a mound of chipped beef and cream. "I have never seen a poison that did not have an antidote," he thrust at the brass hats. "Now if we only had a Pinkham in the Navy—"

"Why the h— didn't we?" Major Garrity yelled. "Instead of—Lieutenant Pinkham, you leave the mess!"

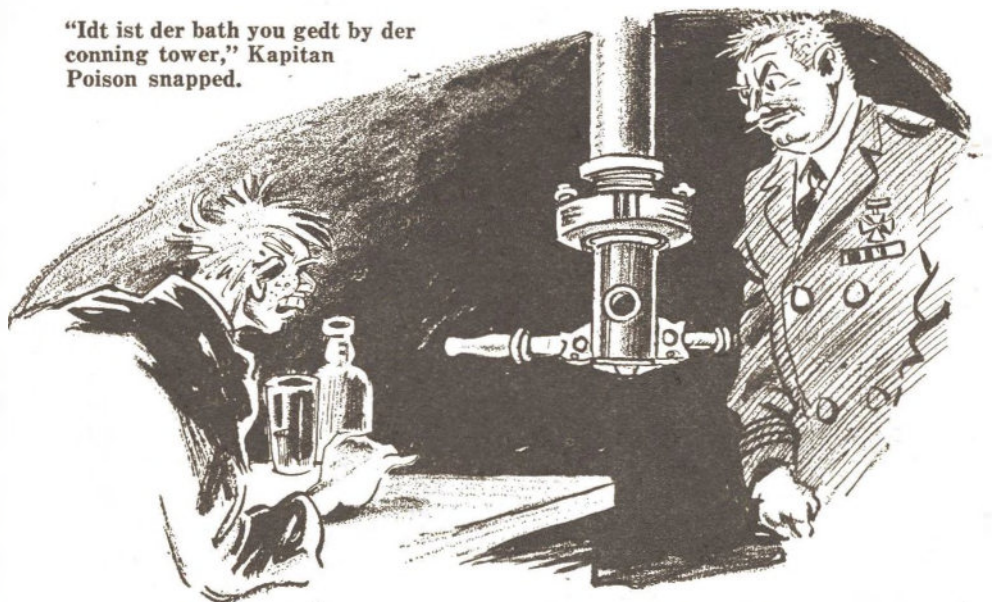
"*Merçi beaucoup,*" the Boonetown volunteer chirped. "I generally do, haw-w-w-w-w! It's not fit even for stomachs lined with zinc. If you will excuse me, gentlemen?" He pushed back his chair cheerfully.

"Put him under arrest, Garrity," the brass hats howled in unison. "We'll prefer charges! We'll—"

"It's been done before," the Old Man assured them dismally. "By generals in three armies. But you can see he is still with us. I wish you luck, though."

PHINEAS strolled across the field to his hut. He did not stay there long. Almost immediately he was back at the farmhouse leaning against the sill of a window which was open a bit from the bottom. By sleight of hand he tossed something through the aperture, then legged it to the back of the house. A mess attendant who was dumping swill into a G. I. can looked

"Idt ist der bath you gedt by der conning tower," Kapitan Poison snapped.



at the sore thumb of the squadron sourly.

"Huh," exclaimed lieutenant in flight, "I thought I heard a Gotha comin'. D'ja hear it, Goomer?"

"Naw, I didn't hear nothin'," replied Glad Tidings Goomer, the sad-eyed mess attendant. Then he sniffed the air. "Cripes—a gas attack!" he hooted and dived under the back steps. From inside the farmhouse came a smattering of curses. A most disreputable odor began to seep out through the kitchen.

"Ugh!" Phineas gulped. "It's even worse than I thought." He gripped his nose and kept on the run. From the shelter of a gnarled apple tree he peered out across the field. The brass hats were piling into their car, service caps planked close to their faces. Pilots, with Garrity in the lead, were scrambling out of the place yanking on gas masks. The siren screamed. Phineas grinned with a surge of satisfaction. He ambled nonchalantly toward the Wing. Old Man Garrity ripped off his mask.

"You—!"

"It's probably only a skunk an' its family movin' up toward the lines," the incurable joker suggested. "Haw-w-w-w-w! I never saw such scared old dames. The wind is just right, isn't it?"

"Did you do that, you ape?" the C.O. screeched apoplectically. "What did you do, eh? By-y cr-r-r-ripes, Pinkham, I—"

"You can't prove nothin' on me," Phineas yipped. "I wasn't there. You threw me out yourself. You better stop breathin'. For all I know that may be real gas the Jerries—"

"Jumpin' Jehosophat!" Garrity held his breath while he clamped the mask back in place.

Not until midnight did the Ninth Pursuit Squadron again function with any degree of efficiency. The Old Man unmasked and sniffed the air cautiously.

"It's all over," he hollered then. "All right, men!"

Phineas ambled into the farmhouse munching a piece of pastry about that time. "I found out what it was two hours ago," he informed everyone quite innocently. "It was Sergeant Casey changin' his socks. Haw-w-w-w-w!" He doubled up to duck the chair the Major reached for. Just then Casey himself appeared and stuck out a hand that had been well snared by a rat trap.

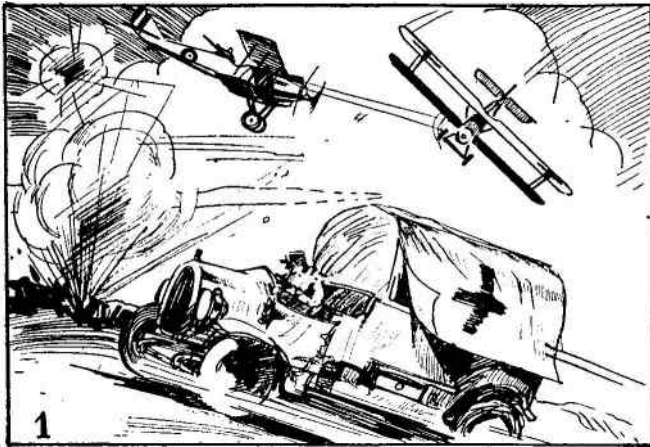
"I put my hand in a tin can where I keep nuts an' bolts," he complained loudly. "An' that's what happens. It's some fresh groundman an' nobody should get a leaf of absence 'til the guy owns up. I'm gittin' sick an' tired of—"

"Haw-w-w-w-w-w!" interjected the Pinkham guffaw.

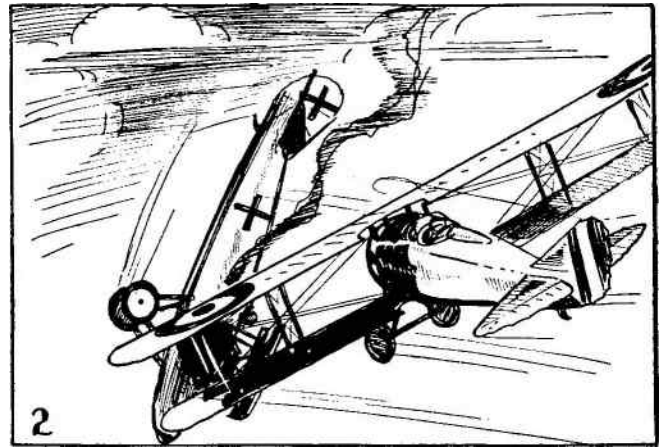
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# Lives of the Aces in Pictures

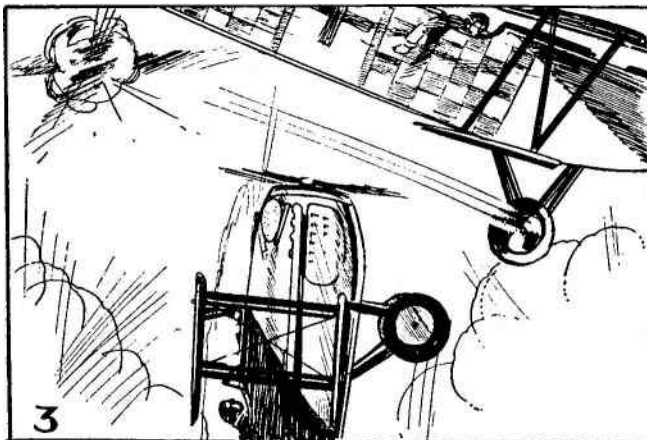
XLI—Lt. Frank L. Baylies, U. S.—12 Victories



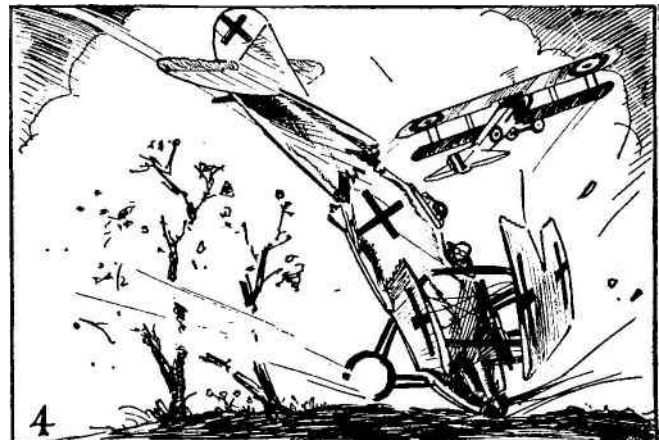
1—Frank Baylies went to France to drive an ambulance the year before the United States entered the war. He received a citation from the French government for his heroism in aiding the wounded. His work in the ambulance service made him more determined to get into real action, so he joined the air service.



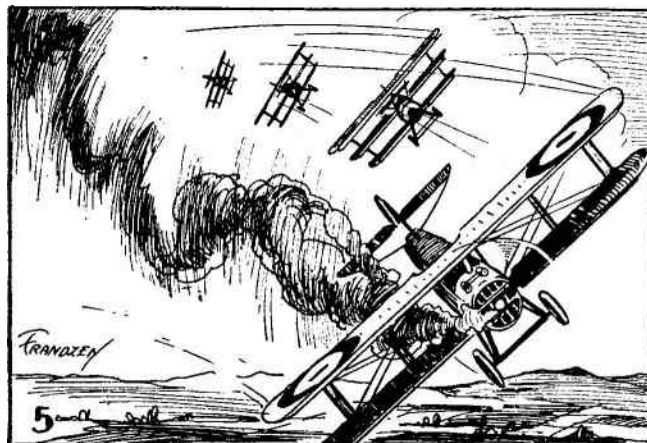
2.—During his training period, Baylies became so promising a pilot that the Storks invited him to join their outfit in Oct., 1917. A few months later, this nineteen-year-old youth won his first victory. By his cool judgment in combat, he justified the confidence placed in him by that famous squadron.



3—In May, 1918, he won his fifth victory. Two Germans were close by. Baylies stood his Spad on its tail and got in well-aimed bursts at one of the German ships. It immediately went down out of control.



4—The same day, Baylies jumped one of five two-seaters which were on a photography flight. Baylies' first attack on the rearmost German plane missed, but he came back under the tail and the Hun fell. It was Baylies' second victim that day.



5—On June 17, 1918, Baylies went on a prowl over the German lines. He spied several German tripes high above. Climbing to attack them, Baylies failed to notice another lurking German who pounced on him from the rear. Baylies' Spad spurted smoke. He went down behind the German lines where he died from his wounds.



6—Frank L. Baylies was born in 1896 at New Bedford, Mass. He was always interested in mechanics and sports. France bestowed all her most coveted honors on him for his skillful and courageous fighting qualities. Although his air career was less than six months long, he ranked high among America's aces of the war.

# What Is Italy's Air Strength?

Il Duce's air ministry has kept the actual facts of the nation's air power well veiled. But Italy's air legions are undoubtedly formidable, even though the renowned flying boats will be of little use against such foes as the Abyssinian tribesmen. This is the first of several articles on the air strength of the nations. Mr. Martin will consider the flying forces of Japan in our December number. Don't miss it!

\* \* \*

By David Martin

**A**S this is written, weather, which always plays a big part in military campaigns, is all that is holding up the actual declaration of war between Italy and Ethiopia, if we are to believe the correspondents who are covering the astonishing affair out there in Africa. Perhaps by the time this appears in print, the forces of Mussolini and Haile Sallasie will be battling to the death across the parched and barren frontier of Ethiopia and Italian Somaliland.

Italy has a peace-time army of 500,000 men under compulsory service. In the past few weeks, this number has probably been doubled by recalling reserves to the colors and ordering two-year earlier classes to report for training. In Naval power, Italy stands fourth, a position ahead of Japan. In the air, her exact standing is uncertain—but we can gain some idea of her power by consideration of the present Italo-Ethiopian impasse.

Ethiopia is a land of 11,000,000 souls and in most records is not credited with an army of any sort. Actually, however, it is certain that 300,000 native troops could be recruited within a short time, and possibly 500,000 in six months. The real problem would be to equip them properly. It must be recalled that Italy and Ethiopia have fought before over such problems that face them today, and it must also be explained that according to all laws of war the native troops of Mangasha, the Abyssinian leader, gave the Italians under Baratieri a severe trouncing. But that was in 1895—before there were such things as airplanes. It was the failure in contacting the roving troops of Mangasha and preventing wholesale slaughter through ambushes, that forced Italy to ask for peace at Addis Ababa and brought about the signing of the treaty providing absolute independence of Ethiopia.

Today it will be different, unfortunately, for the Ethiopians have no air force to speak of. A few years ago they owned three British Moths, but these have since been cracked up. Their destruction involves a pathetic, and yet humorous, adventure of an American Negro pilot who calls himself Colonel Julian, the Black Eagle of Harlem. We have been given to understand that this picturesque gentleman is back in Ethiopia again, offering his services to Haile Sallasie.

It will be the air power that will save the Italians from repetition of the disastrous defeat of 1895. No nation today, no matter how loyal her troops or how well they know their own battle ground, can expect to face the trained troops of a modern power equipped with up-to-date weapons, tanks, armored cars, and high-speed machine guns. The Abyssinians might hold the Italians off for a time with their knowledge of native warfare through the defiles and passes peculiar to Abyssinian topography, but eventually the prying eyes of Italian airmen must ferret them out. The fragmentation bombs of low-flying attack ships and the machine-gunning tactics of contour chasing single-seaters will eventually break the morale and strength of the tribesmen of Haile Sallasie.

What, then, is the real strength of the Italian Air Service? What has Mussolini to offer in the way of a real fighting air force? We saw the Italian air strength displayed in one form when twenty-five Savoia-Marchetti flying boats under the command of Italo Balbo made the successful mass flight from Rome to the Chicago World's Fair. It was a spectacular feat glorifying the romance of the air. Those unacquainted with the painstaking preparation necessary for such a flight immediately pleaded for added air protection. They said: "If twenty-five military planes of this type can fly successfully from Italy to the United States, what defense have we to counter such moves in war time?"

The statement, of course, was absurd. No such formation could reach this country from such a distance, strike a telling blow, and re-

turn again. The actual range of aircraft has not as yet reached that perfection. Still, the Balbo mass flight gives an indication of what Italy can do and what she has in the way of equipment. It showed that the Italians can plan carefully. They lost but one ship during the whole flight. They have splendid equipment and well trained pilots.

But the Savoia-Marchetti ships will be practically useless against the Abyssinian tribesmen. They are flying boats, and an attempt to use them from the coast of Italian Somaliland, or from the coast of Eritrea, is completely out of the question. To reach Addis Ababa, capitol of Abyssinia, from Eritrea—the nearest water

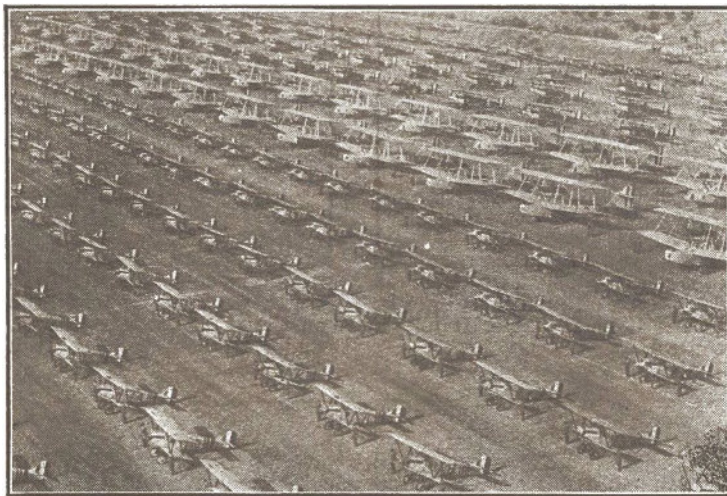
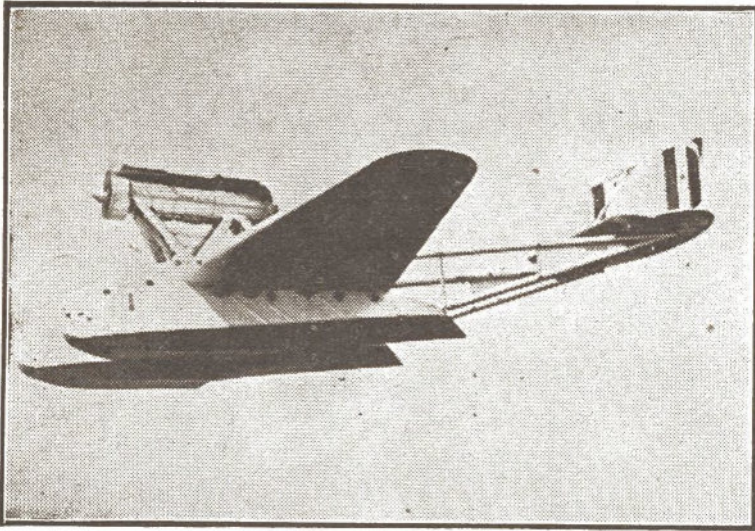


Photo by John Green

Italy has real air power! Here are more than 800 Fiats and Caproni 103 amphibian bombers lined up on one field for Mussolini to inspect. What chance has Ethiopia against such an array?





The famed Savoia-Marchetti flying boats of the Balbo squadron, one of which is shown above, would have to be flown over 400 miles of treacherous mountain country to get to the Abyssinian strongholds with their bombs and machine gun fire—

base—they would have to fly over 400 miles of mountainous territory, utterly unfitted for flying boat activity.

**T**HE makeup of the Italian Air Force is interesting. The tactical elementary unit is the squadron. Two or more squadrons, depending on their location and work, make up a Wing. There are two or more Wings to a Group and two or more Groups to an Aerial Brigade. Next comes the Aerial Divisions, which are composed of two Brigades, and present plans call for two or more Divisions to make up the Air Fleet. Thus, if we calculate on a basis of eighteen machines to a squadron, it shows that Italy has at least 576 first line machines in the Home Aerial Areas. In addition, there is a special re-grouping of squadrons in certain outlying areas which are not given in our records. There is also one airship group.

The most recent figures on the Italian Air Service indicate that her material strength is far above our calculations of 576 first line machines. Italy has 173,171 men on active service with her Air Service. Compare this with the 45,626 of Great Britain and 39,913 of France. Great Britain, with that number of men in service, has but 838 first line ships and a total of 1,434 aircraft of all type. France has 1,687 first line fighters and a total of 3,000 military planes of various classes. If Italy has well over four times as many men in her Air Service as France, it is reasonable to presume that she has considerable more than 1,507 machines which she admits to in various European military almanacs.

The training of Italian airmen is also an interesting feature of the service. The Cadet College recruits suitable candidates from the Secondary Civil Schools who after three years are raised to the rank of Flying Sub-Lieutenants. They are then pilots, but they have to continue their work for two more years before being rewarded with the rank of Observer—indicating that the Italians think more of a trained aerial observer than they do of a pilot. This is not new, for the same standing was recognized in several European air services as far back as 1916, when observers were actually in charge of the machine and the pilot had to obey his orders. In the German two-seater squadrons during the war, it was not unusual for the pilot to be a

sergeant and the observer anything up to a captain. The sergeant-pilot is still a feature of the modern R.A.F. two-seater squadrons. He works or flies under the orders of a commissioned officer.

The Italians also have specialty schools where higher-ranking observers are trained. There is a special fighting and pursuit school. Specialized bombing is also a feature of these advanced training centers and both land planes and seaplanes are used.

A Flying Captain, evidently a Wing Commander, takes a special six-month course at the Corso Superiore presso la R. Accademia Aeronautica Caserta. The training center for mechanics, riggers, gunners, photographers, and wireless operators is known as the Scuola Specializzati dell'Arma Aeronautica or the Aircraft Apprentices School, and the same specialized form of tuition over lengthy periods is in vogue.

The squadrons in the Italian Air Service are listed as follows:

Stormi da Caccia—Pursuit and Fighting.

Stormi da Ricognizione—Reconnaissance.

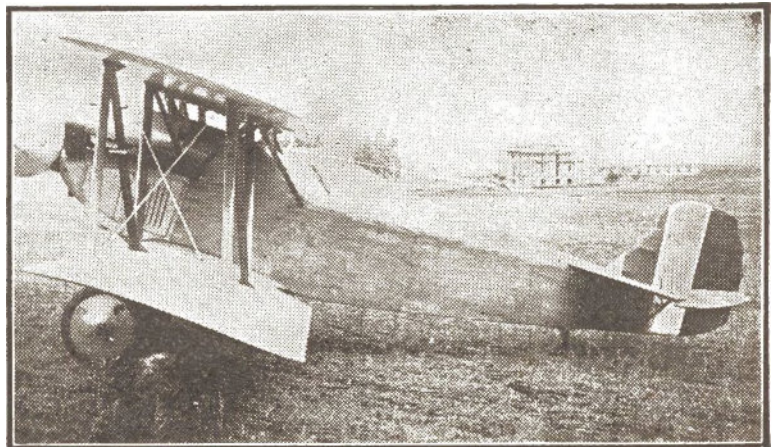
Stormi da Bombardamento Diurno—Day Bombing.

Stormi da Bombardamento Notturmo—Night Bombing.

The equipment used by the fighter squadrons includes the Breda-27, a low-wing monoplane fitted with the Alfa-Romeo Mercurious-IV radial; the Caproni 114 single-seater biplane; the Fiat C.R.30, a vicious biplane with the 600 h.p. Fiat engine; and the Fiat C.R.32, the same machine but one of much greater power, offering speeds of well over 240 m.p.h. and carrying two fixed Vickers guns.

The reconnaissance machines, two-seater fighters of general purpose design, are: The Cant 21bis biplane flying boat; the Savoia-Marchetti S-80, a two-seater amphibian; and the Romeo Ro 30 three-seater cabin reconnaissance biplane fitted with a Piaggio "Jupiter" engine. There are also several larger types that may be used in long-distance observation work, such as the Piaggio P-10 three-seater seaplane; the Caproni 111 long-distance monoplane powered with the 850 h.p. Isotta-Fraschini motor; and several more of the Caproni breed.

The bombers include the Caproni 102 twin-engined monoplane which does 147; the Fiat B.R.3 two-seater bomber monoplane; the noted Savoia-Marchetti S-55, the twin-hulled flying boat which was originally designed for bombardment or torpedo-carrying; and the



—But Fiat fighters of this type may be able to fork the barefooted Ethiopian warriors out of their tortuous passes and defiles behind Addis Ababa.

Savoia-Marchetti S-72, a three-engined land monoplane which carries 12,100 lbs. of bombs.

**T**HIS, then, is the equipment available for the Italian Air Service. For active service work against the Abyssinians, only the land planes can be considered. This includes all the fighter machines, about two types of the reconnaissance ships, and three types of bombers. It might be possible to include the Savoia-Marchetti S-80, which is an amphibian, but it would have to be used out of almost perfect land fields to withstand the gaff.

It is probably unfortunate that Italy, owing to the

great length of coastline found around the nation's famous Wellington Boot peninsula, has had to go in for many flying-boat and seaplane types to carry out the necessary patrols to complete her aerial defenses. But at that, poor Haile Sallasié and his gallant Colonel Hubert Julian do not seem to stand much of a chance where aerial combat is concerned.

For reference purposes, we offer with this article a tabulation of the better-known Italian machines now in active service, including data on type, engines, speed, and armament.

Next month, we shall, in similar fashion, discuss the Japanese Air Service.

## ITALIAN AIR SERVICE CRAFT

### Fighters (Single-Seaters)

Name	Type	Engine	Speed	Armament	Remarks
Breda 27	L. W. Mono.	605 h.p. Mercurious	236	2 Breda 7.7 guns	One of the latest.
Caproni 114	Biplane	420 Bristol	180	2 Vickers	Also a trainer.
Fiat CR-30	Biplane	Mercury. 600 Fiat	230	2 Vickers	Many in service.
Fiat CR-32	Biplane	800 Isotta	?	2 Vickers	On secret list.
Macchi M-71	Fl'g-Boat	400 Fiat	158	1 Vickers	Ship-board fighter.

### Reconnaissance

Cant 21 bis.	Fl'g-Boat	500-Isotta	134	4 Lewis	Several versions.
Romeo Ro30	Biplane	550 Jupiter	139	{ 2 Lewis 1 Vickers	Three seater.
Piaggio P--10	Seaplane	450 Jupiter	?	{ 2 Lewis 1 Vickers	Catapult seaplane.
Caproni 111	Monoplane	850 Isotta	153	No Details	Long-distance ship.

### Bombardment

Caproni 102	Monoplane	two-500 Jupiters	147	No Details	Revised transport.
Fiat BR-3	Biplane	950 Fiat	149	{ 1 Darn 1 Lewis	Much military equipment aboard.
S-Marchetti S-55	Fl'g-Boat	Two 700 Fiats	146	4 Lewis	Also torpedo carrier.
S-Marchetti S-72	Monoplane	Three 550 Pegasus	162	No Details	Carries large bomb load.

## All Questions Answered

This section of FLYING ACES is at your service, F.A.C.'s. Send in your questions and requests for air information, and we will be glad to answer them here in the order received.

Bill Dyer, San Diego:—Who downed Linke Crawford? You've got me. I have always heard that Baracca downed him, but I would not care to say, as no record I have indicates his real end.

L. F. Stuch, Allegan, Mich:—Consult our advertisers for the sailplane plans you desire. The Autogiro, in my opinion, has a fixed place in aviation, particularly with reference to certain work requiring steady flight, short landing

runs, etc. Yes, I believe the United States Air Service is experimenting with them. Most powers are.

J. Newham, Bondi, N. S. W. Australia:—Thanks for the clipping on von Richthofen's death. We are collecting them all to make up into an article—one which we hope will end this senseless controversy for all time. Many thanks again. The same goes for J. D. Fisher, of Thirroul, N. S. W.

Sherwood Tuck, Chicago:—The conflicting information concerning Fonck is easily understood, since his unofficial and official victories have been badly garbled in many records. His true official score is 75. The unofficial score does not matter.

Herbert Staples, Chelsea, Mass:—The Boeing P-26 to which you refer is

listed as an all-metal job. The dural sheets on the wings and control surfaces are not corrugated as were those in the P-12-E.

Julian Todd, Forest Grove, Oregon:—The compressed-air models are rather expensive, but unusually efficient from what I can make out. Some types on the scale you mention have done flights of well over 500 yards.

W. Milner, Hackney, London, England:—Thanks for your letter. We do not know the official speeds of the ships you mention, so can't send them to you. They have not been in service for two years yet.

Harry Maslowski, Lawrence, Mass.:—A round, when mentioning ammunition, means one cartridge.

—By ARCH WHITEHOUSE.



# WISECRACK-UPS



Taxi in on this runway and pick up a plane load of laughs! In this department, we present a collection of jokes, cartoons, and humorous verse. For all original contributions which we can use here, FLYING ACES will pay \$1. No contributions will be returned unless a stamped, self-addressed envelope is enclosed.



"It's time to go South—and he's going North!"

### THEY'RE GULL-WING JOBS

Dumb Dora wants to know whether angels are biplanes or monoplanes?

### SALE

*Pilot:* Three different men wanted to buy my sport plane this afternoon.

*Mechanic:* Say, you can't kid me. There are only two junk dealers in this town.

### LIFT INSTEAD OF DRAG

"I'd walk a mile for a Camel," said the Limey pilot who was down behind the German lines.

### WHAT A BOMB JOKE!

*English Pilot:* I wonder what song would be popular if there was a war on now?

*Greaseball (with a bad cold):* "London on a Raidy Night."

### A MATTER OF TASTE

*First Diner:* The airplanes of the future may be all wing.

*Second Ditto:* Gosh, I hope the birds don't follow suit. I prefer the leg.

### ZOOM JOKE, EH, BOSS?

*1st Stude:* The instructor's mad because I did Mae West spins.

*2nd Stude:* Mae West spins?  
*1st Stude:* Yeah. "I done 'em wrong."

### SO WHY WORRY?

"You won't like flying open cockpit jobs in Alaska. It gets as cold as 70 below."  
"Yeah, but I'd be above."

### MMMMM!

*Captain (to fledglings):* Suppose you are on sentry duty on a dark night when suddenly someone slips up behind you and wraps two arms around you. What would you do?

*Cadet:* I'd say, "Let go, honey!"

### GO AHEAD!

*Parachute Jumper (to pilot):* This time, I'm going to make a delayed jump. I'll drop 12,000 feet before pulling the rip cord.

*Pilot (bored at jumper's boasting):* Swell! We're up just 11,990 feet.



Phineas: We'll fool 'em, Major, and take that short cut through the Vosges!

### HAVE TO BE CAREFUL

*Customer:* I want to pay cash for this airplane.

*Airplane Dealer:* Yes, sir—but your request is so unusual that I'm afraid we'll have to ask you to give us references.

### OTHER WAY AROUND

*Singing Teacher:* Can you carry an air?

*Stude:* No, sir, I'm an aviator.

*Singing Teacher:* What do you mean?

*Stude:* I make the air carry me.

### RADIO SHORT CIRCUIT

*Mrs. Jones (seeing skywriting for the first time):* Lordy me! Somebody's been broadcasting and it caught fire!



"What luck! I landed right in a bloomin' first aid station."

### RETRACTION

Phineas Pinkham had taken to making speeches in the mess hall after supper, and in one of these he said that half the Brass Hats were crooks. For this, Phineas was threatened with court martial, so next night he revised his statement to: "Half the Brass Hats are not crooks."

### NOT WORRYING YET

*Flyer:* This is my new Autogyro.

*Air Fan:* Do you think the Autogyro is here to stay?

*Flyer:* Sure, I'm only two weeks behind in my payments.

### GROUNDING

*Instructor:* Why didn't you bring back that plane I lent you last Saturday?

*Advanced Stude:* Well, I joined a nudist colony over the week-end and I couldn't take off anymore.

### GRRR!

*Major Garrity:* Where's my helmet?

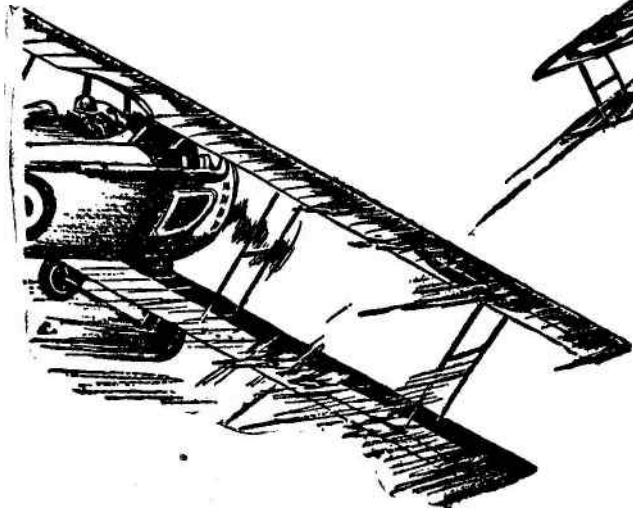
*Phineas:* Over there on the propeller, sir.

*Major Garrity:* I wonder what silly place I'll put it next?

*Phineas:* On your head.

# Aces Aflame

With a jerk, Orth Immelmanned and flung himself upon the other Spad, blasting lead as he came.



AT 3,000 feet, a layer of clouds stretched above the earth like a dirty gray tarpaulin—a tarpaulin that did not always protect. Sometimes venomous insects lurked in its folds—Pfalzes, Fokkers, and others of their species—spinning their webs and waiting for other insects less wary.

Skimming along the under edge of the tarpaulin like an ant foraging for food was a Spad, and five hundred feet below it and some distance ahead was another. In its office sat a small man with irregular features and calm, gray eyes.

Lieutenant "Runt" Petty, the brains and decoy of the "Dynamite Twins," gazed through narrowed lids at a lone, unprotected Albatross two-seater, which was sailing serenely along, apparently on its way to take photographs behind the Allied lines.

Runt Petty laughed mirthlessly. Bait! He dipped his left wings once and his right twice—signal 12.

In the Spad above, Lieutenant "One-Shot" Orth smiled and wagged an answer. Orth was the stinger of the Dynamite Twins. He had been known to get his man with only one burst. Seldom did it take him more than six. He was one of those rare animals, a natural-born marksman with a Vickers. One-Shot had twenty-two enemy planes to his credit, and the adulation of an idol-worshipping public.

But the world did not know what the 174th Pursuit knew—that Runt Petty, not even an ace, was the real power behind the throne of Orth's air supremacy. It was his crafty brain that had originated a set of signals to cover every conceivable situation that might arise in the air. He was the quarterback and interference runner for the two-man football team. Orth was the ball-carrier, and got all the glory.

But Petty didn't care. There wasn't a jealous bone in his body. He was proud of Orth. They had been friends since childhood, and Runt knew his every strength and weakness.

True, "One-Shot" Orth had conquered lead. He'd often downed Huns with a single burst, and seldom did his kills require more than six. But One-Shot had not conquered fire, and when his flying partner, "Runt" Petty, got a "blighty," Orth cringed—cringed as into his teeth they flung that stinging word, "Yellow." And now another grim character entered the drama—Death! Its bony hand reached closer, ever closer—and its fingers were wrapped in flame. . . .

The Albatross hadn't seen them, apparently, but Petty knew that other eyes had. He saw that One-Shot had dropped behind, and slowly pushed his stick over. Like a flash of light, he stabbed down toward the Albatross.

He looked back over his shoulder. The gray tarpaulin had disgorged a swarm of six Fokkers. He saw Orth leave the cloud bank and pounce like a hawk on the rear one. The Fokker burst into flame, and One-Shot swept on to the next.

Runt's ship staggered under a cross-fire of lead. The leading Fokker was scorching his tail, and the gunner in the rear office of the Albatross was trying to snap his prop off. He flung a short burst into that lead-belching rear cockpit and screamed on down, coming up under the Albatross' tail.

But he didn't trip his Vickers again. As long as the Albatross stayed in that position, he was protected, for the Fokkers couldn't get him without bringing down the two-seater, also. The big ship vainly tried to shake him, but he clung to it like a leech. He saw a Fokker go down out of control, then another. One-Shot was doing his stuff.

The two enemy planes that had followed him down saw it, too, and they left him and went up after Orth. Then the Albatross looped upward. Petty looped with it, but at the top of the arc he left it and swept, like a fiery meteor flung from a strange planet, straight toward the three remaining Fokkers, who had Orth ringed in between them.

Petty tripped his guns savagely, and one of the Fokkers turned on him with a snarl. His friend promptly fanned the exposed tail and the Fokker plummeted earthward. The other two immediately lit out after the Albatross, which was limping homeward, evidence that Runt Petty had at least done a little damage with his own guns.

Orth started to follow, but Petty headed him off, and shoed him back toward their own drome.

ONE-SHOT ORTH dropped down onto the tarmac of the 174th with his usual flourish, but his partner came to unexpected grief. Petty's tail assembly had

# GRIPPING WAR FLYING YARN

By Art Dalton

been partially wrecked, and the elevator chose the moment of his landing to go on strike.

The Spad nosed into the ground with a terrific crash. It turned turtle, spilling Runt. One-Shot was the first to reach his side, but Petty picked himself up unassisted, just as the meat basket rolled up.

"Sorry, doc," he grinned, as the M.O. jumped out, "but it looks as if you're out of luck this time. Guess I'm too tough."

One-Shot heaved a sigh of relief. "Lord, I thought you were a wash-out, for sure!" He took his pal by the hand, shook it. Petty winced and turned pale.

"Ah!" cried the medical officer. "A busted arm, or I'm an ace!" He poked the arm exploringly and nodded his head when Petty winced again.

"Fractured, I'll bet!" he said. "I knew no man could take the spill you did without breaking a bone somewhere. That's a blighty, my friend."

"Why, you old sawbones," grunted Petty, "I believe you're glad!"

The M.O. grinned. "Why not? Things have been dull in my department since you two joined the outfit. I never get a chance to practice my art any more. But now—well, a busted arm's better than nothing."

Captain Crowell, C.O. of the 174th, pushed his way through the little group that had surrounded them. He looked at Petty, then at the medical officer.

"How about it, doc?" he barked. "Is he hurt?"

"Probable arm fracture," replied the M.O., trying to look doleful.

"That's hell!" ejaculated the captain.

"Yeah, isn't it?" put in a sneering voice. The voice belonged to Lieutenant Critz, an undersized man with rat-colored hair, and cold, washed-out blue eyes. "I guess it'll be just too bad for the great ace, One-Shot Orth, now. His admiring public is gonna wonder if he's suddenly turned yellow."

Runt started toward him.

"Here, here!" put in the C.O., stepping between them. "Save your fighting for the Krauts. This must never get out about Petty's being grounded. Understand? Not a word of it. If the Vons ever find it out, goodnight! Somebody's got to take Runt's place."

"You, Critz, you're always bellyaching about Orth's string of victories. I'll give you a chance to do something for your country. You're a good flyer, but I haven't seen you bring in any scalps yet. You and Petty are about the same size. You can take his place."

"Yeah," sneered Critz. "What an opportunity that is! I should make myself the goat for that big bragging piece of cheese."

"Who did you say was yellow?" inquired Runt calmly.

A flame of hatred leaped into Critz's eyes. Then a crafty look replaced it. "I'm sorry," he said. "I apologize. I don't like Orth, but I won't let it interfere with my sense of duty. I'll take the job."

"That's better," said the captain. "I don't expect you to do the work as Petty does. No one could. But perhaps it will keep the Jerries from getting wise to the fact that Runt is out of commission. You won't get the glory that Orth does, but after all, we're fighting to win the war, not for ourselves, and you'll get plenty of glory with us."

Captain Crowell turned to the M.O. "Get that arm of Petty's set right away," he commanded, "and none of your blasted experiments. If he isn't ready for duty in two weeks, I'll have your hide."

TWO hours later, Runt Petty, his arm in a sling, was holding an earnest pow-wow with his C.O., in the latter's office.

"I don't like this business of giving Critz our signals," complained Petty, around a quid of tobacco that bulged one cheek.

"Why? Just because he's sore at Orth?"

"Well, yes. I just don't seem to have any confidence in him. He'll probably gum up the works and get One-Shot murdered."

"Rats!" snorted the captain. "It's just your dislike of the man that makes you say that. I don't like him particularly myself, but he wouldn't be in this man's army if he wasn't at least in sympathy with the Allies, so he isn't likely to pull anything underhanded. He's the only man anywhere near your equal in maneuvering a crate."

"Okay," mumbled Runt. "What you say goes, but just the same, I don't like it. There's another thing, though—something I've never told anyone before. Orth is in deadly fear of flames. He's often told me that if his ship ever caught fire, he'd bail out."

"Nothing uncommon about that," grunted Crowell. "We've got lots of pilots who feel the same way."

"Yeah, but this is different," went on Petty. "He wouldn't even wait to see if he could put the fire out. If he was only fifty feet up, it wouldn't make any difference. He'd go crazy—absolutely crazy, I tell you. Do you remember the time one of the boys set fire to a newspaper he was reading?"

The captain nodded.

"And he almost murdered the man that did it," continued Runt. "You had your hands full keeping him out of a court martial, and none of the fellows have liked him since. But the man just naturally went loco. Fire does that to him."

"His mother almost lost her life when their home burned down. She saw his father burned before her very eyes. So you see the fear of fire was born in him. He made me promise never to tell anyone, but I'm telling you so you can keep an eye on him while I'm on the shelf. Don't let anyone play any more fire tricks on him."

"They're not apt to, after what happened before," said Crowell wryly.

"I don't know. I wouldn't put it past Critz. He—"

"Rubbish!" snorted the captain. "Critz is all right. However, I'll keep an eye on Orth for you. I've always figured his flare of temper had something more behind it than mere anger. I'm glad you told me."

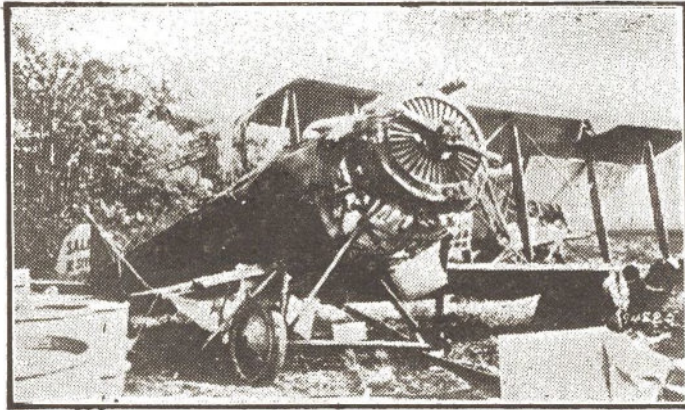
Two days later, Captain Crowell, at the head of "A" Flight, came down out of a cloud bank just in time to see One-Shot Orth fleeing for his life with a pack of hungry Fokkers snapping at his heels. The C.O. could see that his crack ace's ship was crippled, and he promptly dived to intercept his pursuers.

The Fokkers saw him coming, however, and just as promptly turned and fled back into Germany. Crowell followed Orth back to their drome. When the C.O.

(Continued on page 52)



# Snapshots of the War



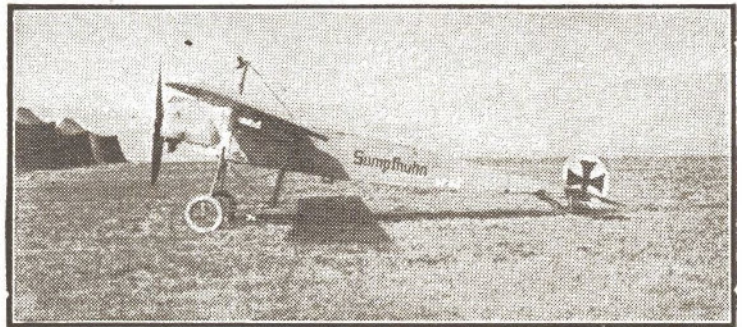
U.S. Signal Corps Photo

Left: Oh, yes, the Germans often scored, too! Here's how a Salmonsson, belonging to the 96th Squadron, looked after a German raider flew over. The ship had been left out on the field—a good target. But the rest of the story is that the German was forced down by American pursuit pilots and had to land on the 96th's field.

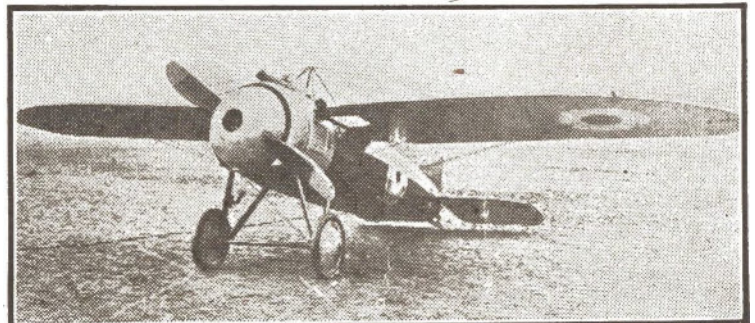
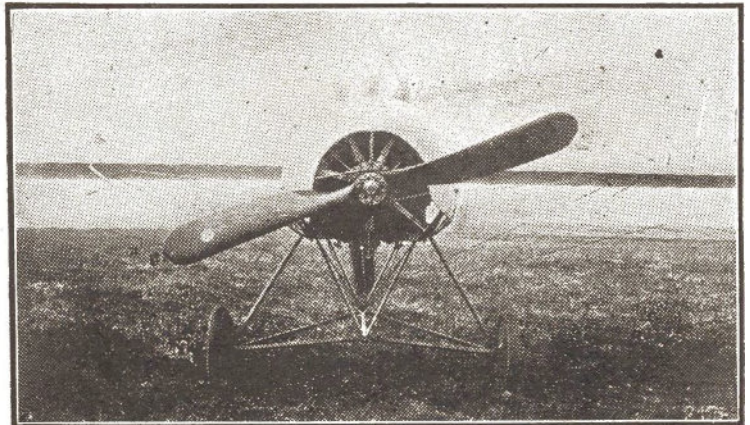
Below: And here's a rare study of the Fokker AE-1 which was one of the first models to be accepted by the German Air Service in 1914. Originally, it was a sport plane, but war knows no bounds and anything that would fly was snapped up. This crate was powered with an 80 h.p. Oberursel rotary.



Above: This is the famed Max Immelmann, noted German ace credited with 15 victories. And now look right center and you'll see the Fokker monoplane he is believed to have flown at the time he was downed by Lieutenant McCubbin, who was piloting an old pusher. This head-on "shot" shows you the three machine guns he carried and the double-row 160 h.p. Oberursel rotary engine. We now get rumors that Immelmann was not shot down, but that his machine collapsed in mid-air after a fight—another argument for us to settle some day.

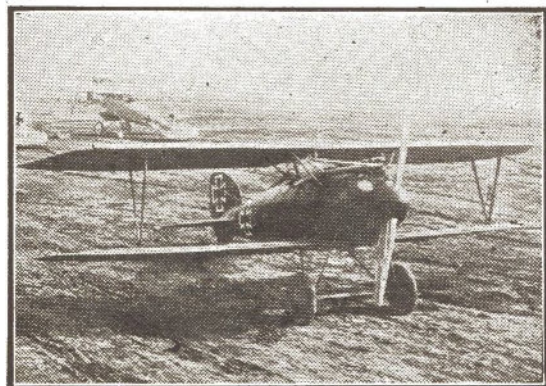


Joseph Nieto Photo



Above: Presenting the crack Bristol monoplanes that saw much service in the Mesopotamia campaigns. It was one of the fastest ships built during the war, but it got nowhere because the British didn't like one-wingers. It carried one gun and was powered with a Clerget engine.

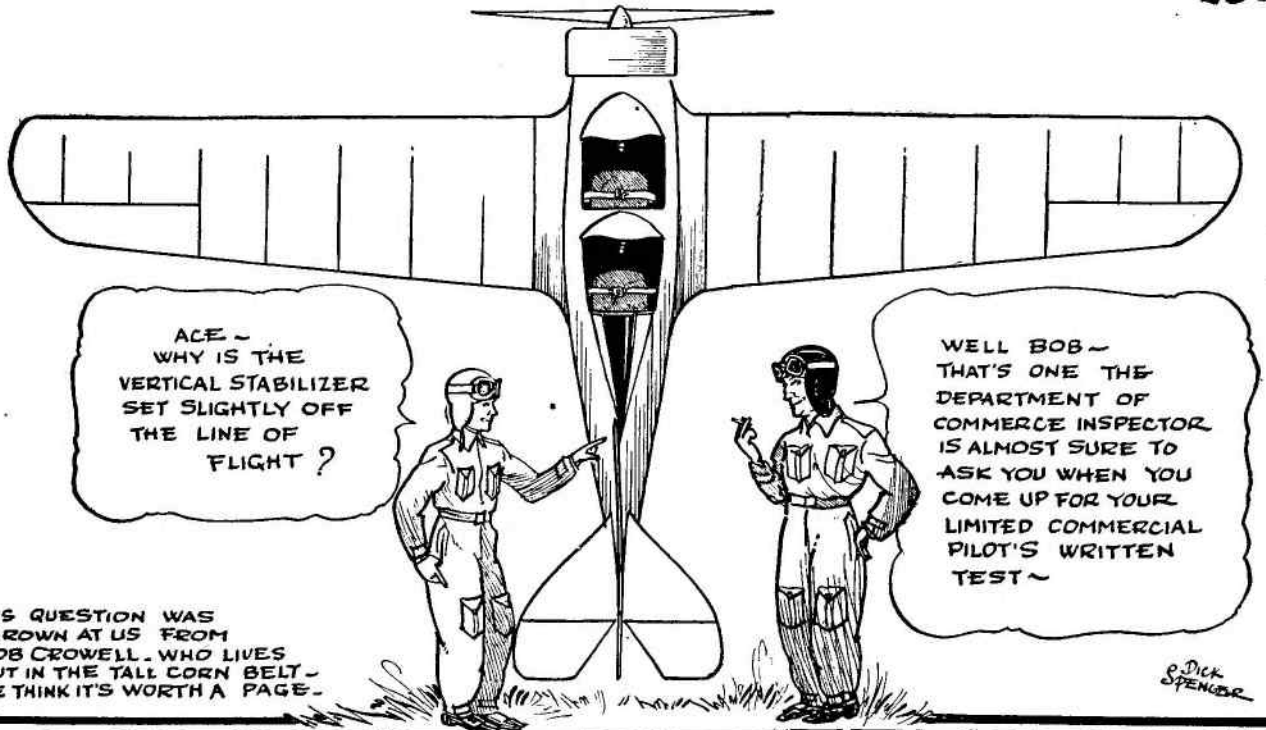
Left: For a few months, the Fokker was driven from its favored berth by this fine Jerry ship—the Albatross D-4 of 1917. It was one of the best planes developed by the Germans, but later Fokker gained control of the Mercedes engine output and won the German staff over to his triplane and jamed D-7.



# FLYING AGES PICTORIAL FLYING COURSE

ACE MCGOY YOUR INSTRUCTOR

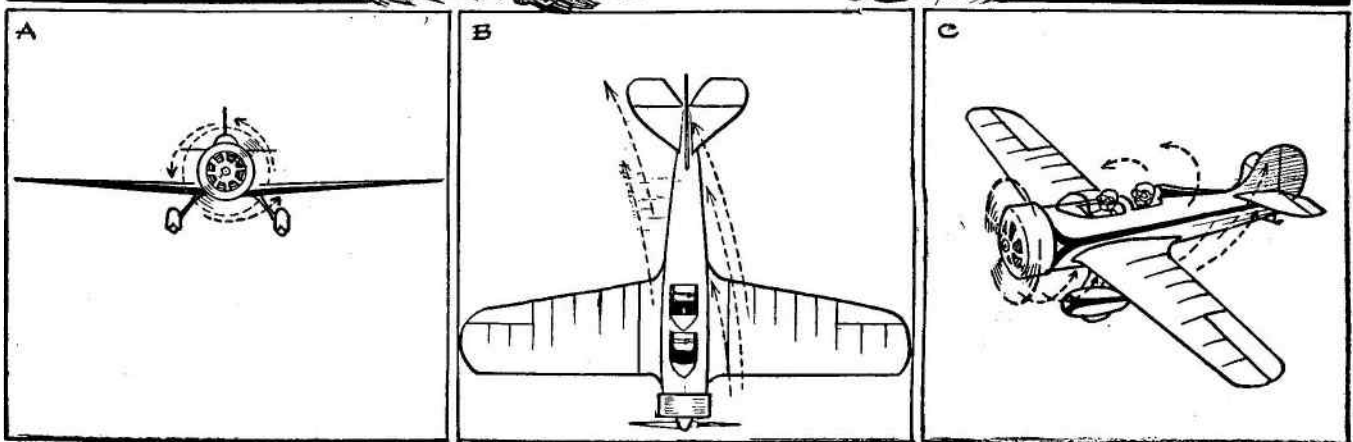
LESSON NO. 23



ACE - WHY IS THE VERTICAL STABILIZER SET SLIGHTLY OFF THE LINE OF FLIGHT ?

WELL BOB - THAT'S ONE THE DEPARTMENT OF COMMERCE INSPECTOR IS ALMOST SURE TO ASK YOU WHEN YOU COME UP FOR YOUR LIMITED COMMERCIAL PILOT'S WRITTEN TEST ~

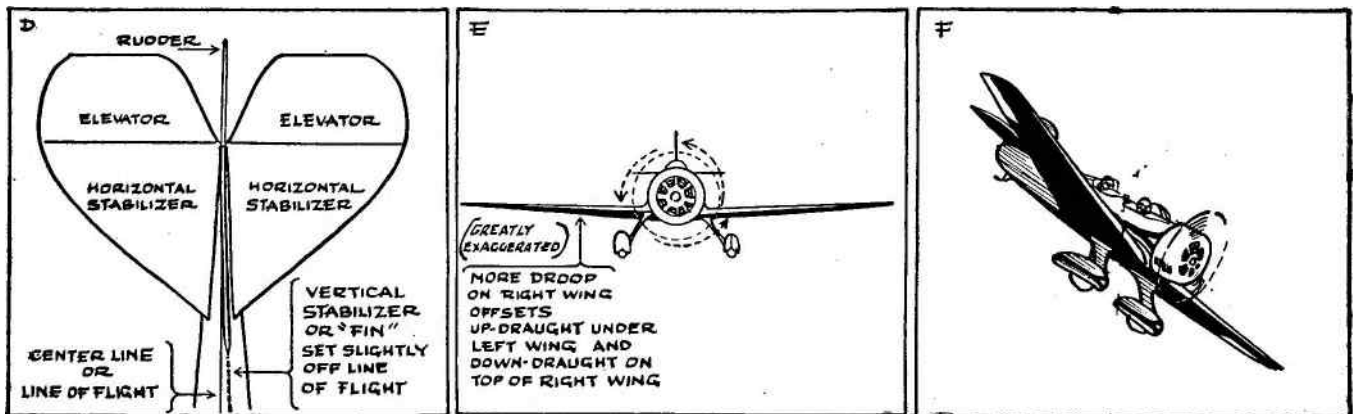
THIS QUESTION WAS THROWN AT US FROM BOB CROWELL, WHO LIVES OUT IN THE TALL CORN BELT - WE THINK IT'S WORTH A PAGE -



MOST American-made engines turn their propellers from left to right—that is, counter-clockwise as viewed from the front. (Most European motors, however, rotate their airscrews in the opposite direction.)

AS the prop rotates, pulling the airplane through the air, the path it cuts is left full of eddies, the swath of disturbed air veering toward the left.

THE principle stream of the disturbed air is swept in the direction the propeller is travelling—from left to right. This effect is called "torque."



SO, in order to counteract this torque, or cross-current, it is necessary to set the fin slightly off the line of flight. To understand the value of this setting, note again the air currents shown in "B" and "C" above.

BECAUSE the turning prop sends air against the under side of the left wing and down on the upper side of the right wing, we give the right wing a little more droop, or "wash out," to preserve balance.

AIRPLANES are like ladies—no two of them have the same temperament. So if you give her just enough droop and the proper fin setting, she'll be a perfect lady. But neglect her, and she'll give you fits!

# Guile of the Griffon

Down through the ebony night dived a strange, black amphibian. Glistening in the reflected light of the great Montauk beam, it glided to the water and taxied to a ramp where two men stood in the shadows. And from the cockpit of that eerie craft crawled a hideously deformed creature—a man whose very existence was a cruel mockery of the grave. "I built—" he croaked, leering at the taller man, "not one plane, but two. The other," he continued in a queer cackle, "went to a man whom you, Keen, will kill—though as yet you've never even heard of him . . . ."

\*\*\*

**T**HAT eerie screech which pierced the night had been increasing in intensity for several minutes. At first, it had come from the west, but now it came from the north. The great beam from Montauk Light seemed to be seeking it. The screech produced a spine-tingling in its hearers, yet it carried an undeniable fascination. At times the cry rose and fell.

Two men huddled in the pointed shadow of a massive cedar tree standing beside a sod-bordered pathway running to the inky waters below. They, too, listened intently and tried to catch a certain beat in that mechanical wail vibrating above them. There was no moon. The night was crisp and cold.

Now the scream developed a new chord. One of the men in the shadow of the cedar nodded, raised an instrument, and squinted through its short telescopic sight, picking out the spiked gleam of an engine exhaust above. His finger pressed the trigger of an Aldis lamp, and two stabbing jets of light flamed out. Instantly, the weird sound stopped, as though a great knife had slashed through the man-made throat that emitted the cry.

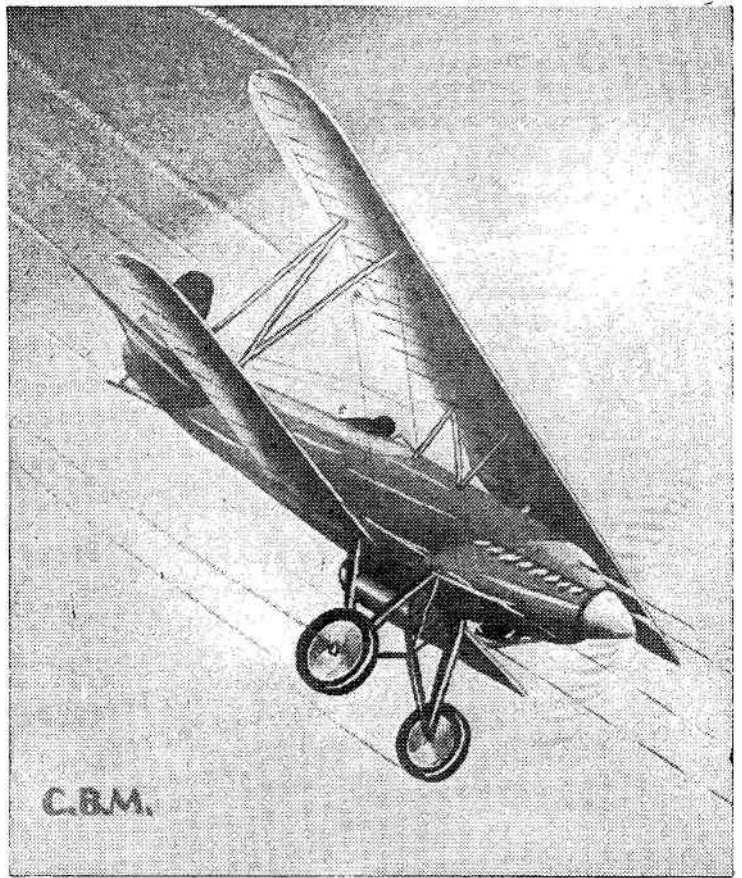
"All right," said the man with the instrument, "he's caught our signal."

In response, the second man darted away and took up a position at the foot of the concrete ramp. He waited, listened carefully, and finally sensed a new sound as of something slipping down from the sky. He waited again, squinted out across the black waters, and finally glimpsed the silver swish of bisected plumes thrown up by two pontoons. He watched them cautiously, one hand on the butt of a massive automatic. Then he smiled.

The low sobbing became more distinct. Then the unmistakable outline of a black mid-wing amphibian crept out of the night. The man on the end of the concrete ramp drew an electric torch from his pocket, gave two short jabs on the button switch, then stepped back into the shadow.

The amphibian came up gently. Her steel prop still turned, slashing the moist air with a low hissing. No sound seemed to come from the motor, but a keen ear would have detected that low crying throb from the mufflers hidden in the heavy wing root.

Out of the water came the ship, her boxed wheels finding the runway. The prop snarled a little louder and the wings now seemed to disappear. Actually, they had



Keen jerked the black amphibian into a half-roll as a streak of spluttering tracer spat past his wing-tip. A Fokker D-19 was on his tail—a Fokker manned by a devil who was determined to prevent his capture of the weird pilotless plane which now hurtled above them.

folded back against the deep, oval body so that in the indistinct light it seemed they were no longer a part of the ship.

"Nolbein?" rasped the man in the shadow.

The pilot's head, protruding only a few inches above the edge of the glassed-in cowl, nodded with a doll-like, jerky movement. Then the amphibian rolled on until it vanished through a hole which suddenly opened in the side of a great rock-garden. When the plane had completely disappeared, the rock-garden assumed its former blend.

**I**NSIDE the hidden hangar, two men stood under the brilliant light that bathed the strange black ship. The little pilot still sat in the cockpit, but he had pulled the cowl back to speak with the two men below.

His voice was a dry cackle. He talked in startling jerks, much like the speech of unfortunates in asylums. At times, the voice was a deep basso that resounded through the hangar, then it would click up into the soprano of an hysterical witch.

He was horribly deformed and his face was pitted with bluish-black splotches. A cruel scar swept from his left eye to his full-lipped mouth. Only his hands, which moved with a weird artistic grace, seemed to belong to anything human. And those hands were the most skillful in the world—at their selected task.

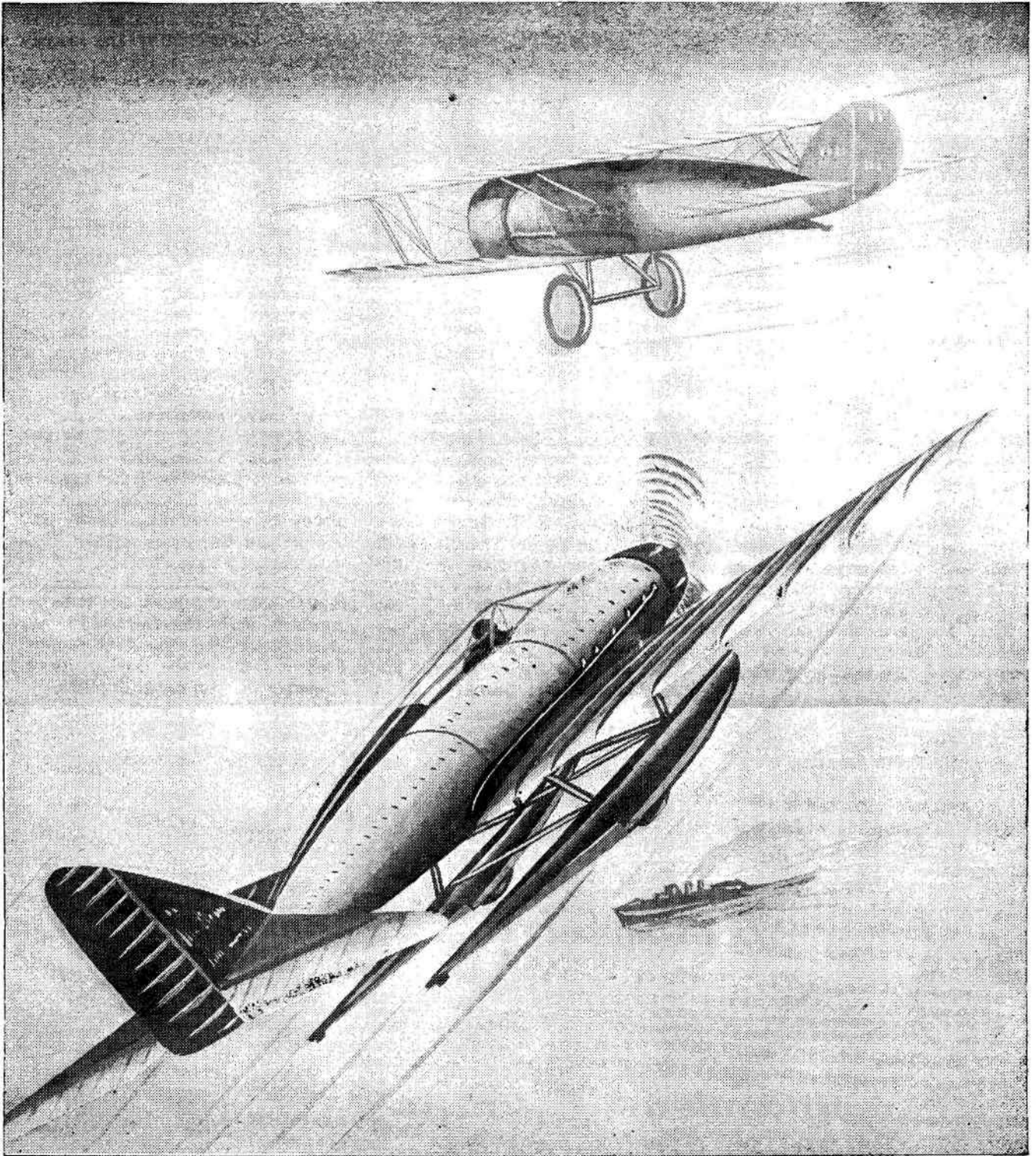
"You are late, Nolbein," Kerry Keen, noted ballistics



# AMAZING "KERRY KEEN" NOVELETTE

By Arch Whitehouse

Author of "Red-Heads of Death," "Hawks of Hate," etc.



Illustrated by C. B. Mayshark.

expert, said. "But she looks like a grand plane."

"I *am* late!" snapped the deformed one. "I should be late. I not only built one—I built two!"

"Two?" whispered Keen, puzzled. "I ordered one—but never mind. Keep it. We may have use for it."

"But I did not keep it," squeaked the little pilot. "I sold it immediately. It was ordered from me."

"Ordered—? Like this?" Keen frowned. "You mean to tell me you sold another ship exactly like this—with

one of your specially-designed motors in it?"

"I did. Why not? I need the money," argued the hideous little pilot.

Keen exchanged a quick glance with his butler-mechanic, Barney O'Dare—a glance that warned the Mick to keep quiet.

"That's interesting," smiled Keen. "Do you mind telling me who bought it?"

(Continued on page 72)

# War Planes Album



ROLAND "WIRELESS"

ROLAND "WIRELESS" MONOPLANE  
**T**HE term "wireless" as used in war-time nomenclature, is somewhat misleading today. Many readers are under the impression that the word "wireless" had something to do with the fitting of a wireless set in the machine involved. But such is not the case. The word "wireless" refers to the fact that no guy or support wires are seen, most of them being carried through hollow struts or incorporated in a cantilever wing design.

The Roland firm took the 190 B.M.W. engine in 1918, probably because they no longer could get many Mercedes, and designed this ship for high speed fighting. The wing, built on the Fokker cantilever principle, was carried on a special bracing built into the upper longerons and supported only by a set of outrigger steel-tubing struts, made up in the form of a broken-N. The wing carried a five-gallon gravity fuel tank as well as the radiator for the engine. The radiator was placed in

such a way as to balance, as nearly as possible, the weight of the gravity fuel tank.

In this ship, we get the true German "Walfische," or whale, effect in the nose, since there is no head resistance common to the ordinary car-type radiator. Beneath the main section of the wing, the body was deep, and the pilot sat well inside the wing cut-out and high enough to see either over or under the airfoil. Thus, his arc of vision was excellent.

His Spandau guns were controlled by the motor-type synchronization gear, and they were set on either side of the cylinder blocks so that only a portion of the muzzle casing protruded.

The undercarriage was formed by two tubular Vees, stiffened by two cross-cables. Their point of attachment corresponded with two fuselage partition bases. The wheel axle was placed in a streamline casing and bound into the bases of the Vees with rubber shock absorber.

No true performance figures on this ship are available, but it is understood that the "wireless" was much faster than the much-vaunted Fokker D-8 or the Flying Razor. Probably too fast for 1918 pilots.

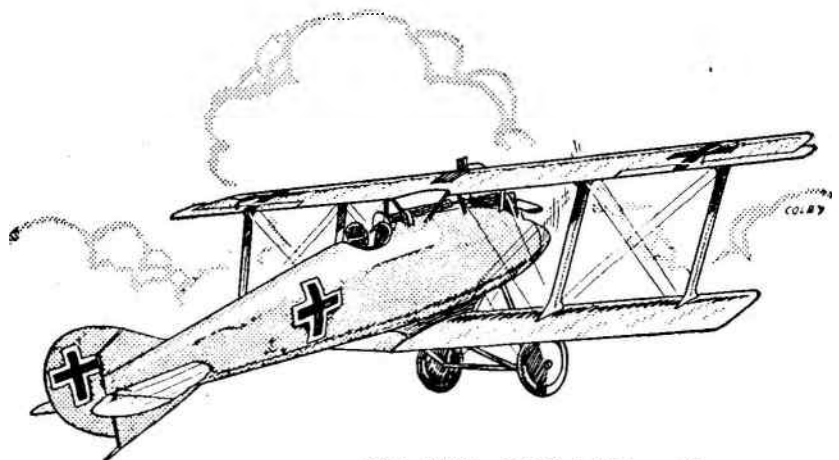
## ROLAND DVIB BIPLANE

**W**E now switch you to the early 1918 DVI biplane which was powered with the 190 Benz water-cooled engine.

The body of the DVIB ship was again a true example of the "Walfische" design. The Benz engine was mounted in the same usual manner, and the radiator was set in the upper center-section. A down-swung exhaust carried the engine fumes clear of the body. The pilot, armed with two Spandaus, sat in a cockpit well aft of the upper wing cut-out. The fuselage itself was built up on oval plates over which strip formers were fitted. Then fabric was laid over and tightly doped.

The tail assembly incorporated the built-in fin which was carried below the body and which housed the sprung tail-skid, somewhat in the manner of the S.E.5. A balanced rudder was carried, but the elevators were not balanced.

The wings and strutting arrangement of this machine will be of great interest to our model builders who are always on the lookout for some-



ROLAND BIPLANE

thing unusual. The wings themselves were built up on a single main spar, internally braced with piano wire, three-ply gussets, and heavy former ribs. To carry these wings, the Roland designers had to develop a new type strut, something of a splayed I-strut. The inner pair were broader in width than the outer and from various angles seemed to be offset. It is quite possible, too, that the controls for the upper wing ailerons

were carried through the hollow inner pair in some manner. Another interesting point is the way in which the lower wings seem to be fitted to the lower portion of the rounded body with streamlined fairing that gave the wings a wider gap.

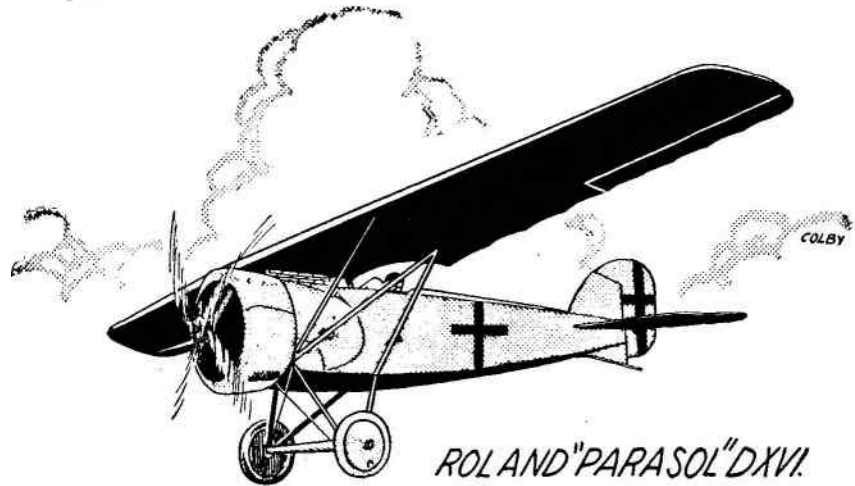
The top speed of this ship with full military load was 118 at 10,000 feet. A number of them were used on the Eastern front in cooperation with the Austrians.

Here's a four-ship flight from the Roland factory, which provided more unusual designs than any other German firm during the War. The Rolands—monoplanes, biplanes, and triplanes—were built by the Luft Fahrzeug Gesellschaft, at Adlershof; and nearly all of the machines constructed were of the "Wal-fische" (or whale) type—so dubbed because with the big 160 or 220 h.p. Mercedes motors generally used, the planes required deep, whale-like noses to carry the engines. And now, let's look 'em over—

#### ROLAND PARASOL

**H**ERE'S one of the most interesting of the long Roland line. This monoplane had a wing built in much the same manner as that of the "wireless," except for the unbalanced ailerons. The wing was mounted a few inches above the upper longerons on short, stubby center-section struts. It was so low, it could hardly put the plane in the parasol class. The rest of the wing-support struts are reminiscent of the old Sopwith One-and-a-half strutter. Streamlined metal tubing was used in the typical N-strut, which was further strengthened by a brace strut running from the upper-rear Vee of the N-strut to a point at the base of the stub center-section strut. The wing itself was remarkably clean and had a slight angle (about three degrees) of incidence.

In this craft, the Roland designers went off their usual streak of motor selection and tried out the rotary type engine—the 200 h.p. Siemens, to be exact. This was an eleven-cylinder power plant that incorporated both the radial and rotary motor features. That is, the cylinders revolved in one direction and the main crankshaft revolved in the op-



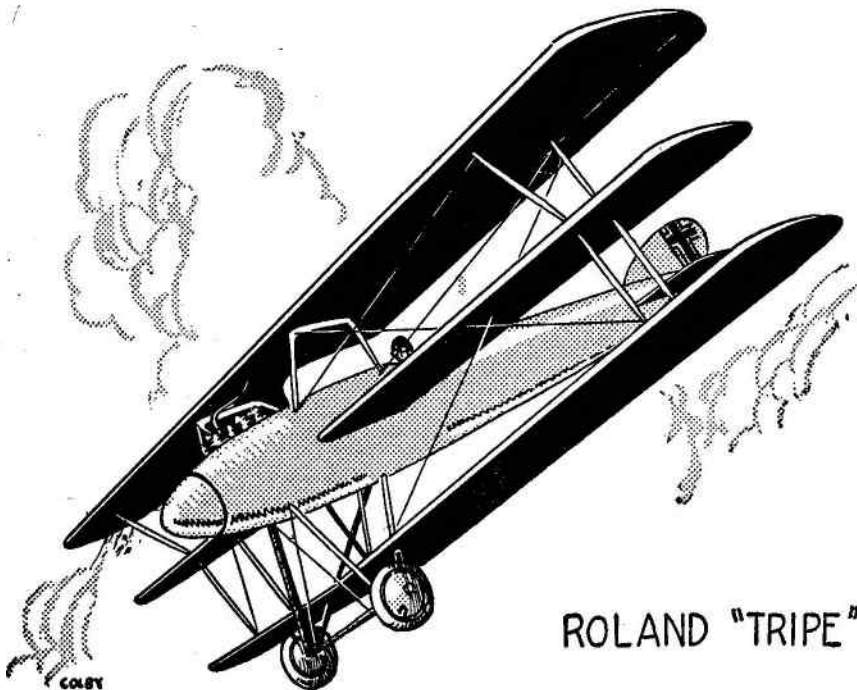
ROLAND "PARASOL" D.XVI.

posite. (We shall have to get more details on this engine and present it in detail for our motor fiends.)

The circular motor cowling was faired into a Sopwith-type rectangular fuselage, built up in the normal manner on four longerons, internally braced and covered with fabric. The tail fin was built into the upper surface of the fuselage, and a balanced rudder was neatly mounted behind. The tail plane was the normal monoplane type with balanced elevators. The undercarriage was built up in

the same manner as that of the "wireless" ship.

An additional interesting feature of this plane was the four-bladed wooden prop which was necessary in order to keep the motor torque of the unusual Siemens engine smoothed out. It might be well to explain here that this torque feature is the only real difference between two and four-bladed props. But four-bladed are more costly to make and a greater expense is likewise experienced in cases of breakage.



ROLAND "TRIPE"

#### ROLAND TRIPLANE

**W**HEN you speak of triplanes today, you instinctively think only of the Fokker triplane. The Sopwith tripe and the Pzalz tripe are

seldom considered. But there is still another interesting triplane that seems to have been hidden away in the records. This is the 1917 German Roland triplane, listed as the D-IV. Actually, this appears on pa-

per to have been a good ship, and why it got so little mention is something of a mystery, unless, as in many other triplane types, its structural weaknesses barred it from the Front—or, like the Sopwith triplane, it landed too fast and was tricky on the stick.

This ship, a cocky single-seater, was powered with a 160 h.p. Mercedes water-cooled engine. The lower wing was fitted but a few inches above the landing wheels and was supported in a garish manner with metal tubes. The middle wing was fitted into the center of the fuselage, while the top plane, which had a much wider chord, was held aloft with unusual inverted U-struts made of metal tubing. To make up for the difference in chord, the struts between the middle and upper wings had to be out-staggered to reach the front main spar. This gave the ship an odd appearance.

The fuselage was of typical German monocoque form, fairly well streamlined and finished. The prop had the usual large spinner. The speed was 110 at 5,000 feet. No other performance details are available.

# Here and There in the Air

In this department, FLYING ACES presents some of the odds and ends of aviation—interesting facts about flyers and their foibles, news picked out of the sky here and there. We hope you like it.

RECALLING AN L. A. FEAT

THE original airship high mooring mast at Lakehurst, N. J., has now been pulled down and dismantled. It was at this mast that the *Los Angeles* once accomplished a feat that has never been executed by any other airship and probably never will be. On a rather flat, calm day in the early afternoon, upon the advent of a sea breeze from exactly the opposite direction, the colder incoming current of air caught the ship directly under the tail and lifted the tail to an elevation of between 85 and 90 degrees. The ship during this motion gradually rotated about her nose spindle and came down to rest on an even keel in the *opposite* direction heading into the sea breeze without any damage to the ship and without a single scratch to any of the 25 officers and men who were on board at that time. The *Los Angeles* showed remarkable unsuspected strength by this demonstration for which no airship had ever been constructed. However, no one wished to repeat the experience and it hastened the advent of the low or stub mast such as is now used where the stern of the ship is secured to a carriage which rides about on a circular rail or prepared path and prevents vertical motion of the stern. It is interesting to note that although the Germans did not employ the high mast at all, they do use the low or stub mast, developed by our Navy, whenever they have need for a mooring mast.

MID-AIR MESSAGE

A TROOP of Sea Scouts recently put out in two boats from a San Francisco wharf for an enjoyable day afloat. Shortly after their departure from the shore, it was found that the food with which they had been supplied was poisonous. The Scout boats were not radio equipped, and as no one knew exactly where they were heading for, it seemed futile to send other boats out in search of them.

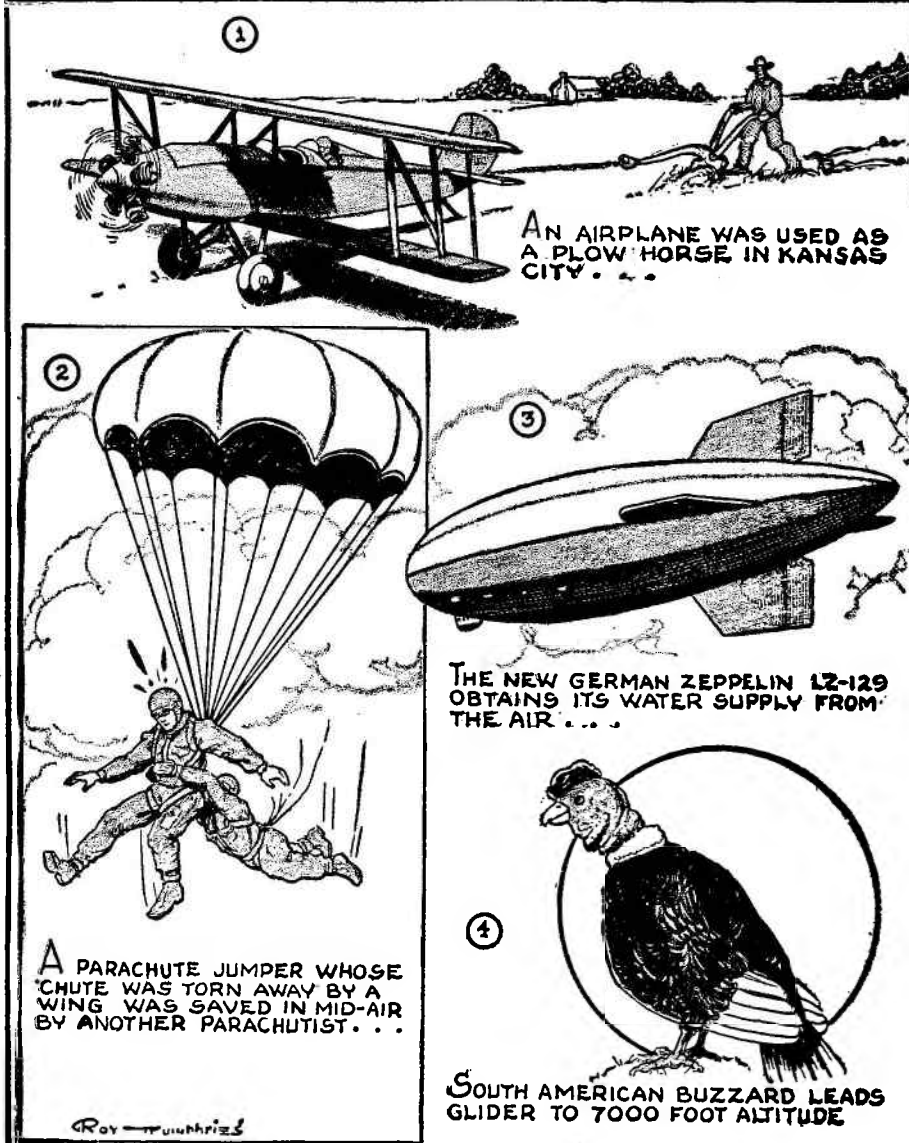
The 11th Bombardment Squadron at Hamilton Field, California, heard of the situation, however. Immediately, Lieutenants Aubrey K. Dodson and O. M. Nelson took off, located the two boats out on the bay, and successfully dropped messages informing the boys of their danger from the bad food.

EVER SEE A BAI YING?

JULIUS BARR, who is piloting a twin-Wasp Boeing 247-D transport in China for Marshal Chang Hsueh-liang, reports that his craft is known throughout China as the "White

## PILOTOPICS

By ROY HUMPHRIES



1 AN AIRPLANE WAS USED AS A PLOW HORSE IN KANSAS CITY . . .

3 THE NEW GERMAN ZEPPELIN LZ-129 OBTAINS ITS WATER SUPPLY FROM THE AIR . . .

4 SOUTH AMERICAN BUZZARD LEADS GLIDER TO 7000 FOOT ALTITUDE

2 A PARACHUTE JUMPER WHOSE CHUTE WAS TORN AWAY BY A WING WAS SAVED IN MID-AIR BY ANOTHER PARACHUTIST . . .

### Stories Back of the Above Pictures

1—A biplane was hitched to a plow during the ceremonies of breaking ground for a new airplane factory in Kansas City, Kan., in 1929. The mayors of Kansas City, Kan., and Kansas City, Mo., guided the motorized "Dobbin" in the new "back to the earth" movement.

2—All the thrills of an old time five reel picture were provided with Russian atmosphere in Moscow last July when a Soviet soldier named Noskoff fouled his 'chute in making a jump. Hurting through space he struck another parachutist, and clutched at him frantically. 300 feet above the earth the reserve 'chute opened and both landed safely.

3—The new German Zeppelin LZ-129 contains a two ton apparatus which will obtain water through the use of silicon dioxide. This is a system which recovers water from the exhaust of burned fuel—the recovered liquid balancing the weight lost by the consumption of the fuel.

4—A lazy South American buzzard, flying over Rio de Janiero, Brazil, recently aided a glider pilot, Peter Riedel, to obtain an elevation of 7,000 feet. Watching the way the buzzard took the various air currents, Riedel followed suit and learned that birds also know a little about gliding.

Eagle." He explains that the name "Boeing" is difficult to pronounce in Chinese. "Bai Ying" is about the nearest they can come to it—and that means "White Eagle."

#### THE LATEST WAR GAGS

**T**HERE are times when we believe that service aircraft designers get most of their ideas from war-air stories as published in modern aviation magazines.

Take the latest brain-wave they have just developed in England. They have a rebuilt Westland monoplane fighter fitted with a Bristol "Perseus" motor which will do something over 200 m.p.h. This was originally a monoplane interceptor that came out about the same time the Vickers "Jockey" had the world talking.

But the interesting point of this machine is that they have carefully fitted a 37-mm. gun firing 1½-lb. shells. This

would be all okay except for the fact that the gun is fitted into the starboard side of the fuselage and fires—of all directions—*skywards!*

Then there's the new Mk. V. two-seater Pterodactyl fighter, which is being fitted with a hush-hush gun, a power-driven weapon designed especially for this machine. That must be a pip.

The United States is up to the same tricks, too. We have a new stratosphere gun firing at 50,000 feet—higher than any plane can fly, as yet. How they range it on something out of sight, or what they expect to hit, have not been explained.

#### SHORT FLIGHTS

Fay Gilles, American girl flyer, who has been teaching some of the fine points of aviation to young Russians, says that over there, children of seven and eight years are taught to jump in parachutes. Towers are built for the

purpose, and the embryo aviators leap from them. The chutes are opened before the jump is made, minimizing the risk, but that does not remove the training. . . . The regents of Smithsonian Institution recently awarded the Langley gold medal for aeronautics to Dr. Joseph S. Ames, of Johns Hopkins university, for his research work with National Advisory Committee for Aeronautics. This medal is considered one of the foremost awards in American aviation.

Rumors of Germany's increasing air strength that have floated over the French and English borders have caused both of these nations to stir themselves a bit. The French estimate is that Germany has 300 fast commercial transports which could be quickly converted into bombers, 100 pursuit planes capable of a speed of more than 300 miles an hour, and 300 modern observation planes, the latter being officially listed as mail planes.

# On the Light Plane Tarmac

Side slip into this corner, all you light plane fans! On this tarmac, FLYING ACES has set up a clearing hangar for facts and fancies about light planes and light plane flying. And now to turn the first prop—

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**S**LOWLY but surely, the light plane sport is coming into its own. The spirit is there, hence the ambition requires but little impulse now. The main factor lacking in the picture is the equipment. True, the light plane enthusiast has had little encouragement, either from the manufacturers or the Department of Commerce, but it appears that in the near future things will be different.

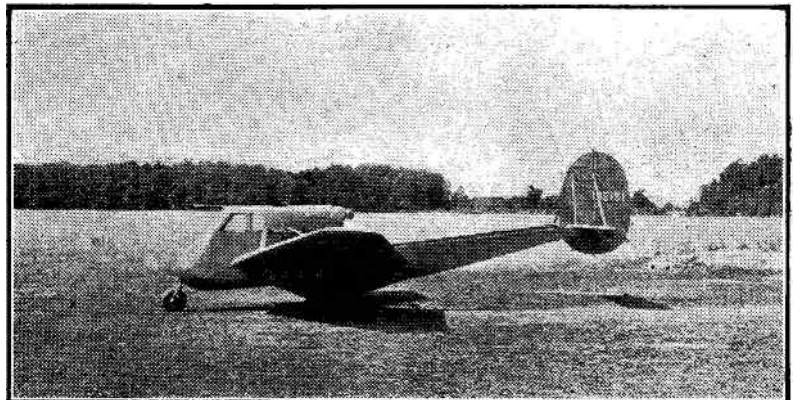
Gene Vidal, of the Chamber of Commerce, recently announced that all commercial ships intended for private ownership are to be plainly marked to show their airworthiness, particularly with reference to their suitability for light-plane or private pilots. A ship may have a top speed of 125 and a low fuel consumption, but whether it is easy to fly is quite another matter. In other words, for the time being, speed will be sacrificed for safety, which is something we of FLYING ACES have advocated for some time. We'll take a slow-landing 100-m.p.h. ship that can be flown safely under ordinary, or even certain extraordinary, conditions in preference to one that does 125 and has to be fought from the time she gets her wheels away until the pilot slams them back again.

The rest of this matter is in the hands of the light-plane fans. If there is a demand for safety under *all* conditions, the manufacturers will be glad to take \$200 out of the motor cost and put it into inherent stability.

**Y**OU have all seen the recent movies of the new Hammond Model-Y ship in action. It is the C. of C.'s pet light plane just now. It stands a good chance of becoming America's "divver of the air," although we

don't care much for that term. They have given the Hammond "Y" job plenty of trials. A number of Chamber of Commerce aeronautics inspectors have been given them for their routine work and so far they have proven their worth. There is no chance, as yet, of the ship being offered for the much discussed \$700 price; but if it does prove its worth as a real light plane, the C. of C. will see that the firm is properly backed and given every chance to get into real production, which will eventually bring the price down under the \$1,000 mark, anyhow. After that, the sky's the limit.

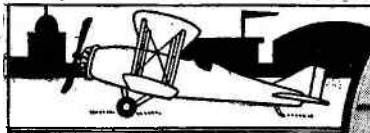
**H**ARRY N. ATWOOD, a Milford, N. H., furniture manufacturer, has devised a new method of moulding veneer and plastic wood into suitable bodies and  
(Continued on page 84)



Here we have the Hammond "Y", a promising entry in the current race to turn out a safe, easy flying, and reasonably-priced light plane. The "Y", you will note, is a low-wing pusher, with outriggers to carry the tail assembly. That's the propeller, photoed tip-on, at the rear of the engine mounting.

# HAPPY LANDINGS

BY ARCH WHITEHOUSE



## Is Germany's Air Force a Menace?

Full details concerning the power of Goering's Guards are unknown. There are two viewpoints on the matter—the French and the British. And the British don't believe Germany has an air force of any real worth. What's your opinion? In this article, Mr. Whitehouse presents both sides of the question. Take your choice!

✱ ✱ ✱

**W**E of FLYING ACES have attempted from time to time to give some information on the actual strength of Germany's new air force—the 1935 facts and figures. Several photographs of ships now in use in the German single-seater, two-seater, and bombing squadrons have appeared in our pages, and by judicious inquiry both here and abroad we've gathered data to go with the pictures. We believe we've uncovered most of the Nazi air force craft—at least those that can be looked upon as actual war planes, suitably powered, properly armed, and worth consideration where air strength is involved.

America is interested in the air service of every country in the world—and it should be. The air service is the new first line of offense, regardless of which countries are involved. So if Germany has anything new or unusually strong in the air weapon line, naturally this country is interested. For one thing, many American motors are being made over there under license. Many planes are being purchased from American firms, particularly the Boeing transport, which in reality is only a revamped Boeing bomber. And there are many American service ships over there today, some for inspection, with the possibility of sales or the grant of manufacturing licenses. If Germany gets herself into a new European conflict, several American manufacturers will have more than a passing interest in what goes on.

For instance the German B. M. W. Works has the manufacturing rights to the Pratt and Whitney "Hornet" engine, of which there are several models ranging in power from 600 h.p. to 750 h.p. They also manufacture some of the British Rolls-Royce engines under license, but no French types. What French engines they use, are purchased outright from the French manufacturers.

The stories that come from abroad—those you read in the newspapers, for instance—have one of two originations. They either come from France or from England. And the stories from these two sources are as far apart as the poles. While the French view with alarm every move the Hitler government makes, the British have attempted to take the calmer side. One of these two countries is right. The trick is to find out which has the correct slant.

The French eyes see high-powered bombers with astounding ranges of action. They see two-seater fighters

bristling with guns. They tell us of high-speed single-seat fighters capable of remarkable ranges and altitudes.

Paris has it that along with the manufacture of new and lighter submarines, the Germans are thoroughly violating the Treaty of Versailles by building a new and impregnable seaplane base on the Island of Sylt in the North Sea. They call it a second Heligoland with new fortifications—concrete bomb-proof shelters housing long-range coastal batteries and anti-aircraft guns. These works have been in progress, it seems, for several months.

The French report, as presented in a noted London paper, has it that from last November 300 bricklayers and masons worked at Sylt, secretly building eighteen special barracks for the officers and men of a new air force. In addition, they tell of a large number of other buildings disguised with thatch roofs to look like fishermen's huts, but which in reality are bomb-proof cellars with walls constructed of five-foot thick concrete.

On this construction, only reliable Nazi workmen have been employed. They have built secret emplacements in the sand dunes for monster disappearing long-range guns. At the little port of List, on this island, a massive derrick arrangement has been erected capable of lifting the largest type seaplane from the water and depositing it within a few seconds in an underground hangar. At Kampen, according to the French report, are other lifts which lower land planes into great hangars hidden under the dunes.

### THE OTHER VIEWPOINT

**A**LL this was printed in England, garnished with pointed sarcasm. But it should be remembered that it was the French who first declared that Germany was preparing a monster air service and a new Navy—in short, that they were preparing to break every rule of the Treaty of Versailles. French spies found this out two years ago, but the British did not believe it until they had sent in their own spies and verified the amazing statements.

Today, however, British air journals have taken up the matter of checking the actual strength of the German Air Service, and after a careful perusal of what they have discovered through various agencies, have decided that the much vaunted German Air Service is

nothing to get upset about.

For instance, they have found that the German fighter squadrons are being equipped with a new Arado which is nothing more than a copy of the American Curtiss Hawk, fitted with Pratt and Whitney "Hornets." The British attitude is that while the ship may be O.K. it is no better than its power plant, which indicates that they do not have much use for the Hornet of 650 h.p. But Britain has never given the air-cooled radial a break anyway. It is the writer's contention that machines are only 45 per cent of the battle where single-seaters are concerned. The pilot is the important thing, and until Germany has had time to develop high-speed fighter training schools their single-seaters will not be much of a menace.

In the matter of two-seater fighters and reconnaissance ships the British have more respect for the Germans. The two-seater Dorniers, the new two-seater Heinkels, and the two-seater Arado, are admitted to be far above the average; but here we see that it is motors that play the big part, for most of them are fitted with either the Rolls Royce "Kestrel" or the B.M.W. engine. The new guns Germany is supposed to have perfected in the last few years add to the effectiveness of these ships.

It is in the bomber field, however, that Britain admits Germany may "have something." They refer, of course, to the new Junkers Ju 52/3M three-engined machine which has been in use for some time on the Luft Hansa routes. These ships are powered at present with German-made "Hornets,"

but these are to be replaced with new Junkers 24-cylinder (double-twelve) water-cooled plants which turn out 1,000 horse power. With this ship, the British admit, the Germans could reach the Midland industrial area of Britain, or even London, in two hours.

"But," the British editors add, "if German ships can come over here in that time, it stands to reason that British ships could fly over there in the same manner, and probably a bit faster."

Which leaves us admitting that there is no answer to that. But, personally, the writer is of the opinion that if Great Britain does not take every effort to check each move the Germans make as far as air strength is concerned, she may find herself in a far

(Continued on page 52)

## The New Airmail Pals

**W**E know that you letter-writing buzzards are looking for quicker Airmail Pal "take-offs." Due to the flood of letters that's been piling in on this "airport," the schedules have been slowed up, causing quite a delay in getting names into the mag.

Well, we're happy to announce that we've hit on a new system that will guarantee you an Airmail Pal—the kind of an A.P. you want to hear from—and you'll have your Pal in short order!

Here's how the plan works: First, you write a letter just as if you were writing to your new Pal. Then you send this letter to Airmail Pals, care FLYING ACES, 67 West 44th St., New York City. And *be sure* to enclose a stamped, self-addressed envelope.

Now, when your letter arrives at FLYING ACES, we select a Pal for you from our batch of letters—the sort of Airmail Pal your letter indicates you want—and we

mail *his* letter to you, and *yours* to him. Then you're all set! Of course, if you want additional Pals, you may write us again.

First off, as the letters come in, we're going to take care of all you scribes who have previously written to us, but whose names haven't yet appeared in FLYING ACES. So watch for the postman, buzzards. Letters will soon be coming your way.

And don't miss "The New Airmail Pals" in our December number. It will give you a whole flight of info about the way the new Pals are going. Our "mail ship" will be touching all the high spots, so there'll be plenty of news notes.

Below, we print the box-form Airmail Pals for the last time. It was a "good ship" that saw a lot of fine flights, but now it's outmoded. *Vive la* New Airmail Pals!

Name	Address	Description
ALFRED COSTEN ROBERT BINDER	5981 Mance St., Montreal, Quebec. 510 E. Potter Ave., Milwaukee, Wisc.	16. Interested in all phases of aviation. President of an anti-homework league. Let's all join!
FRED KNUSSMAN	1367 Arlington Ave., St. Louis, Missouri.	11. Photo swapper. Wants to hear from Missourians. Chemistry his hobby.
JACK PETTERSON JOHN SNYDER NORMAN COAN	9134 So. Throop Ave., Chicago, Ill. 144 Lucas Ave., Kingston, N. Y. 304 Michigan Ave., Westville, Ill.	Wants to hear from English Scouts. Westerners especially welcome on his tarmac.
MICHAEL WYZGA JOHN NOWELL	847 Pennsylvania Ave., Trenton, N. J. 267 Cherry St., Fall River, Mass.	Ditto on Westerners. Wants plans for six-foot, rigid Navy blimp. There's an order!
JAMES MURRAY	94 Pineapple St., Brooklyn, N. Y.	Who wants information on World War planes?
MATT PORTZ ROBERT BESWICK	105 E. 1st St., Springfield, O. 826 Maple St., Bethlehem, Pa.	Has built 75 models. He says girls will do. How about it, ladies?
DONALD DESAULT GEO. HAERTLEIN HENRY O'CONNELL JACK CONDER	79 Pearl St., St. Albans, Vermont. 3023 W. Juneau Ave., Milwaukee, Wisc. 154 Norman Ave., Brooklyn, N. Y. 402 Lincoln St., Shawano, Wis.	Welcomes letters from foreign places. Model building and hiking fan. Wants to hear from English folks. Who'll give him pictures of rare war-time planes?
ARNOT ELLSWORTH EDWIN RICKETTS	511 N. Horsman St., Rockford, Ill. 4824 Hubard Ave., Los Angeles, Cal.	Future Navy flyer. Says he's not handsome, but will send picture. 14.
JACK FULMER	4245 11th St., Rock Island, Ill.	28. Says he's handsome, and likes the ladies. Hmmm.
J. BRYANT	Alameda, Cal.	Wants to start F.A.C. flight in his neighborhood.
MILTON WEGLEIN	5200 Sheridan Rd., Chicago, Ill.	Cartoonist, model builder. Girls his hobby. Is this lady's day?

# JOIN THE FLYING ACES CLUB

TO advance the cause of aviation, over 50,000 men and women, boys and girls, have banded together to form the Flying Aces Club. To become a member, fill in and mail the application coupon below, along with a stamped, self-addressed envelope for return of your official membership card.

It costs nothing. There are no dues. After becoming a member, you will be all set to win your Cadet Wings, Pilot Wings, Ace's Star, and perhaps the D.S.M. Take the first step NOW—fill in and mail the membership coupon!

It's easy to start an F.A.C. Flight or Squadron. Tell your friends about the F.A.C. and its official magazine—FLYING ACES. Ask them to buy a copy and join the club. Counting yourself, six members are necessary to form a Flight; a minimum of 18 for a Squadron. To become a member, each applicant must fill out and mail the application below. Be sure, when writing, to enclose a stamped, self-addressed envelope for your reply. This is important.

## Honorary Members

President and Mrs. Franklin D. Roosevelt  
Vice Pres. John Nance Garner

Casey Jones	Rear-Admiral Byrd
Wallace Beery	Capt. Edward Rickenbacker
Al Williams	Colonel W. A. Bishop
Col. Scaroni	Major G. A. Vaughn, Jr.
Gifford Pinchot	Mrs. Gifford Pinchot
Major von Schleich	Willy Coppens
Lieut.-Col. Pinsard	General Balbo
C. E. Kingsford-Smith	Josef Veltjens
G. M. Bellanca	Amelia Earhart Putnam
Capt. Boris Sargievsky	Senator David I. Walsh
Colonel Roscoe Turner	Lowell Thomas
Charles W. A. Scott	Tom Campbell Black
Richard C. DuPont	Eric Kingsford-Smith
Amos 'n' Andy	Walt Disney
Jackie Cooper	Frankie Thomas
Gov. James V. Allred	Lieut.-Col. Theodore Roosevelt

## AWARDS AND HONORS

### The D.S.M.

The Flying Aces Club Distinguished Service Medal is the highest award of the Club and is given to those whose work on behalf of the F.A.C. is "beyond and above the call of duty." It has been awarded for obtaining prominent men and women as Honorary Members, for exceptionally successful activity in the promotion of the Club, for outstanding work in covering the secret assignments of G-2.

Winners of the D.S.M. who merit further awards will be given beautiful bronze props. Worn on the ribbon of the D.S.M., they may be compared to the bronze palms awarded to winners of the Croix de Guerre. The highest award of the F.A.C. is the D.S.M. with three props.

### The Ace's Star

The Ace's Star is awarded to regular members of the F.A.C. who have qualified for their Cadet and Pilot Wings and who have succeeded in enrolling five new members in the Flying Aces Club. Each new member must fill out the Application Coupon below. Get five of your friends to do this, send in their applications all together and win the F.A.C. Ace's Star.

## Official Charters

F.A.C. Flights and Squadrons are recognized only when they have been awarded Official Charters. These Charters are illustrated to depict the various steps of advancement in aviation, and the wording is in keeping with the high ideals and purposes of the Club. They are printed on a very fine grade of paper and the names of the Squadrons are hand-lettered. Charter applications must always be accompanied by a complete list of members with their addresses. For the Flight Charter send 25c, for the Squadron Charter 50c, to cover costs.

## Volunteers for G-2

G-2, the Inner Circle of the F.A.C., is open to a restricted number of members who are qualified for Secret Service activities. Those who are chosen will have unusual opportunities to win the Club's Distinguished Service Medal. Those who are accepted will be given a secret number and identification card as well as the secret code. Assignments will be made by letter and code.

## Attention, F.A.C.'s!



WE not only have a new supply of the handsome F.A.C. Club Ring, but now offer you the beautiful Identification Bracelet, as well. Both are finished in antique silver—the ring being self-adjustable to insure a perfect fit. Either ring or bracelet will be sent postpaid anywhere in the U.S.A. for only 50c each.

COUPON  
No. 36



Save This Coupon for the  
**NEW CADET WINGS**  
of the Flying Aces Club

All members with Official Membership Cards are eligible for Cadet Wings. This coupon, with two others and 10c, entitles members to Cadet Wings. Do not send this coupon alone. Save it until you have three. Then send them in all together with a self-addressed envelope and 10c to cover cost of wrapping and mailing. Only one pair of Wings to a member. If you lose yours, send 25c for new ones.

Canadians send International Reply Coupon for 15c. British send one shilling in coin or International Reply Coupon for one shilling.



COUPON  
No. 33

Save This Coupon for the  
**NEW PILOT'S WINGS**  
of the Flying Aces Club

All regular members who have won their Cadet Wings are eligible for Pilot's Wings. This coupon, with four others and 10c, entitles Cadets to Pilot's Wings. Do not send this coupon alone. Save it until you have five. Then send them all together with a self-addressed envelope and 10c to cover cost of wrapping and mailing. Only one pair of Wings to a member. If you lose yours, send 25c for new ones.

Canadians send International Reply Coupon for 15c. British send one shilling in coin or International Reply Coupon for one shilling.

## November Membership Coupon

I, the undersigned, hereby make application for membership in the Flying Aces Club. I agree to live up to its rules and regulations; to foster the growth and development of aviation; and cooperate with all other members in the work of spreading aviation information, building up confidence in flying for national defence and transportation. I will aim to build up the Club and its membership, and do my best to win the honors that the Flying Aces Club offers.

My name is .....

Age .....

Street .....

City ..... State .....

Mail this application, enclosing a self-addressed, stamped envelope. Canadians send International Reply Coupon worth 5c. British send a similar coupon worth sixpence.

# Citation and Awards

## of the Flying Aces Club

The Distinguished Service Medal of the Flying Aces Club has been awarded to the following members of G-2 for exceptional services to the club:

Edith Davis  
Joe De Fiore

Millard Harthertz  
John H. Hammell

The following winners of the Distinguished Service Medal of the Flying Aces Club have been given the first award of the bronze props for additional services to the club:

Joseph McDermott  
Ernest Clark  
Albert Distefano  
Ken Zarrilli  
Edward Massey  
Harold Lloyd  
Charles Russell

H. Eisele  
Michael Scalfani  
David Hall  
Bob Archer  
Sally Ford  
Ed Baggs

The following winners of the first award of the bronze props have been given the second award of the bronze props for additional services to the club:

Robert Sadoff  
Fred Dragone, Jr.  
Jack Keller  
E. H. Wagner  
Ed Errett, Jr.  
Julius Blum  
S. B. Schulman  
Joseph Von Waldron  
Carl Ulanowicz

Donald Leiter  
Stephen Yamalides  
Joseph Cordes  
Arthur Warren  
Bob Tartaglione  
Raymond Dowsett  
Leslie Papier  
F. L. Piet, Jr.

The following winners of the second award of the bronze props have been given the third award of the bronze props for additional services to the club:

Jack Kendall  
David Score  
George Forman  
Herman Spenger  
Donald Keynton  
Philip Brown

Charles Ames  
Leonard Czaplicki  
John McArdle  
Lawrence Sutton  
Jack Staff

The following members of G-2 of the Flying Aces Club have been awarded the silver F.A.C. ring for exceptional service to the Club:

David Jamison, Jr.  
George Marvin  
John Trotta  
Saul White  
Henry Schab  
Gordon Morton  
John Schaffer  
Harrison Brennan

Lynn Foxworthy  
Ferol Decker  
Douglas Fadden  
Adolph Betterini  
Stanley Mazzotta  
Charles Pelant  
Eugene Mulcahy

The following members of G-2 have been cited by the Flying Aces Club for exceptional services to the club and are being considered for the Distinguished Service Medal:

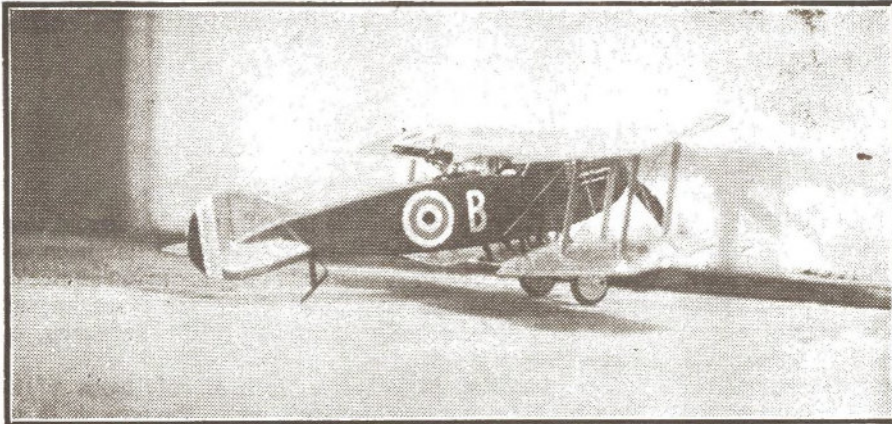
James Flaherty  
Roger Pendleton

Dorothy Gens  
Jack Salyards, Jr.

**FLYING ACES CLUB—67 W. 44th St., New York City**

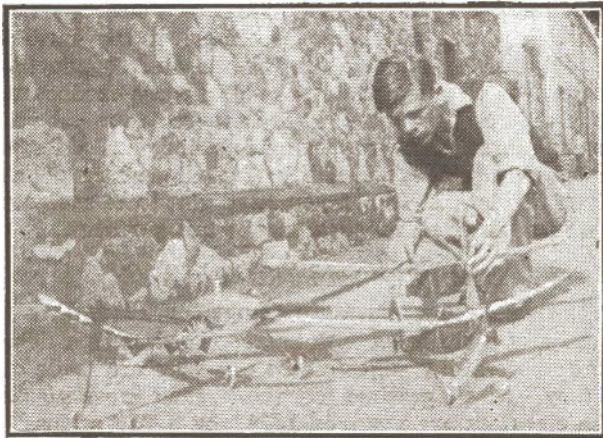


# With the Model Builders



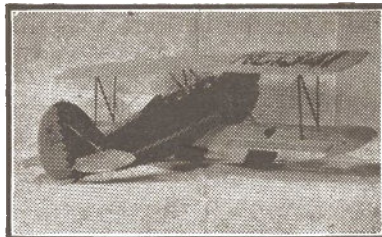
Above: Arnold Smith, of Pittsburgh, built this snappy Bristol and sold it to a department store for advertising purposes. It's a grand job in every detail and shows how model making can be turned into money making. Plenty of fellows have cashed in on their ability to construct good models—and all you builders who've got "what it takes" can regard this as a hint. And now getting back to Smith's Bristol, note what a swell job he's done with the stagger, dihedral, and sweep of the fuselage! If this plane was man-size the British could have flown it in the war.

**ATTENTION, Model Builders!** More than half of the "shots" you buzzards send in for this page aren't clear enough, or the model images large enough, for suitable reproduction. Make sure your models are photographed clean with backgrounds which show up the details of your workmanship—a good model is worth a good photographic job. Look up the article titled, "How to Get Good Model Photos" in last month's FLYING ACES, and read the article, "Photo Your Models in Movie-Type Settings" in this issue.

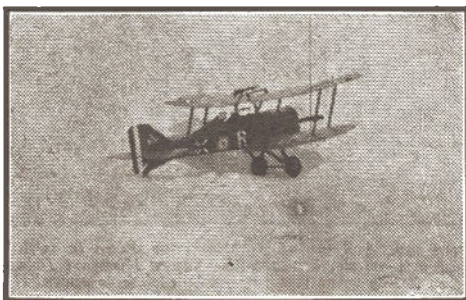


Above: A four-ship flight from Wales! Bud Morgan, of Cardiff, a regular reader of FLYING ACES, sends us this picture of his group of models. They are all well done, and all the more credit is due because Bud lost his right hand in an accident a few years ago. There's a lad who deserves our cheers!

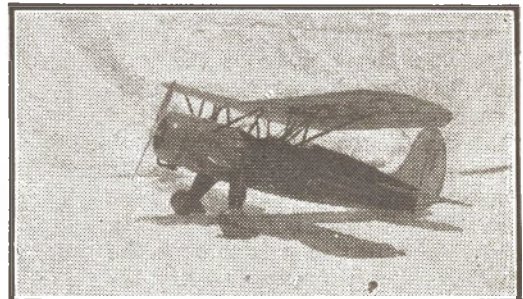
Right: And here's a natty Great Lakes Sport Trainer built and flown by George V. Wagner, of Reading, Pa. The interesting feature is the detail involved in doping and finishing the job. The wings are well done, too, with a nice piece of sweep-back construction on that upper wing. Well, George, happy landings with your NC1841!



Steve Kowalik, of Wilmington, Del., is a Boeing hound! Above we see his interpretation of the Boeing F4B3 fighter. At first it fooled us, too, but no, it's an actual model and not a photograph of a real machine. Steve is certainly a top-flight strut-er, undercarriage-er, and engine cow-er! Right? And by the way—get out your August FLYING ACES, turn to page 27, and compare the Bernet brothers Boeing fighter, shown on that page, with Steve's.



Left: Harry Mangan is another who knows the fine points of model building. Here's the S.E.5 he flies out of Fort Worth, Texas. Harry goes the limit on his jobs, and even the pilot is made to such detail that his goggles may be removed! Harry also has a Spad and Fokker D-7 which he has constructed with the same care. You camera men will note that the image in the photo is rather small—but the plane shows up well because Harry has used a good background.



The popular Fairchild 22 all ready to be warmed up and flown! This one was turned out by Harry Hollmeyer, of Westley Hills, Mass., and it shows rare accuracy in building. Attention to the niceties of design simply gleam from every rib and strut. And it flies with A-1 performance, my lads.

# The Nieuport Delage 580

One of the crack fighting planes of France, the Nieuport Delage 580 has won wide popularity among the French pilots—and justly so! Train your eyes on the top-flight model pictured at the bottom of this page, and you'll agree with the French! This is a model you builders will want to turn out with true craftsmanship. Below, Mr. Limber tells you how.

★ ★ ★

By Nick Limber

**A**MONG the models that made their debut at the Thirteenth Annual Paris Air Show, the Nieuport Delage 580 is the particular model that has become dear to the French pilot's heart. The flying characteristics of the ship are a closely guarded secret of the French Air Ministry, therefore it is impossible for us to give you performance data on this remarkable craft—but we can show you how to build an excellent flying model of it, such as the one pictured on this page.

## FUSELAGE AND MOTOR HOODS

**A**FTER you have carefully studied the plans and are sure you understand them, you are ready to start construction of the model. Since all-balsa fuselages are in style and are very easy to build, we will construct our fuselage of balsa blocks. A 14" by  $\frac{3}{4}$ " by  $2\frac{3}{8}$ " block will be needed for the side of the body. Two of these blocks glued together will give you the right size for the fuselage. First, trace the side view of the body from the drawings to the balsa block. This done, cut around the outline just made and sandpaper the newly cut surface. When this operation has been completed with both blocks, glue the two blocks together. Care must be taken that the glue is just on the edges of the blocks or else you will have a hard time splitting the blocks when the time comes to hollow out the body.

Plate C shows templates AA, BB, and CC from which you make other cardboard templates. Each one is used to set up flush against the side of the fuselage at the positions marked on the drawings. A sharp knife is used to shape the sides of the fuselage, and sandpaper is employed to finish the surfaces. By holding the template flush against the side of the body, you are able to tell if you are shaping the sides correctly or not. If you hold the body up to the light and no light passes through between the template and the outside wall of the fuselage, you have shaped the body correctly. This method helps you get both sides of the fuselage correctly shaped. When the sides of the body have been finished you may split the blocks along the glued line and proceed to hollow the inside of the fuselage. Hollow until the walls of the body are about  $\frac{1}{16}$ " thick. When the inner walls of the body have been sandpapered, reglue the two blocks together again. Notice that the diagram calls for a small groove in the front end of the body for scale purposes. Three  $\frac{1}{4}$ " holes are also drilled on both sides of the body. The next step is to dope the fuselage and put away to dry before sanding surfaces again with the fine sandpaper.

While the dope is drying, make the motor hoods as shown in Plate

A. A soft grade of balsa is used for the hoods and they are hollowed out after the desired shape has been obtained. A piece of  $\frac{1}{16}$ " dowl is used for exhaust stacks. When the exhausts have been glued into place, cement the hoods to the body at a  $45^\circ$  angle, as shown on Plate D.

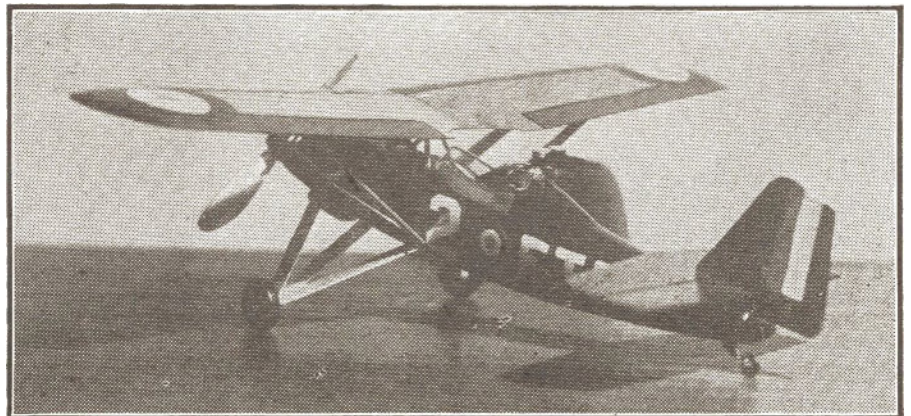
Our next step is to get a block of soft balsa 4" by  $1\frac{1}{4}$ " by  $\frac{7}{8}$ ". Out of this block, carve the cockpit form, as shown on Plate E. Care must be taken that the form does not split when you are hollowing out the inner side of the form. When the cockpit form is complete, cement it to the fuselage and make piece Z, as shown on Plate A. This piece is glued to the nose of the body and acts as a socket for the nose plug. A similar socket is used to support the rear plug and is shown on Plate C. It is wise to see that the sockets are made of the hardest balsa obtainable. Now make the radiator, employing cardboard or thin metal. (I would suggest cardboard, as it is very easy to work with compared to metal and is much lighter.) The radiator is nothing but a series of plates glued side by side. The side view of the plates is given in Plate A. When you have glued the radiator plates into place, start work on the tail surfaces.

## TAIL SURFACES AND WINGS

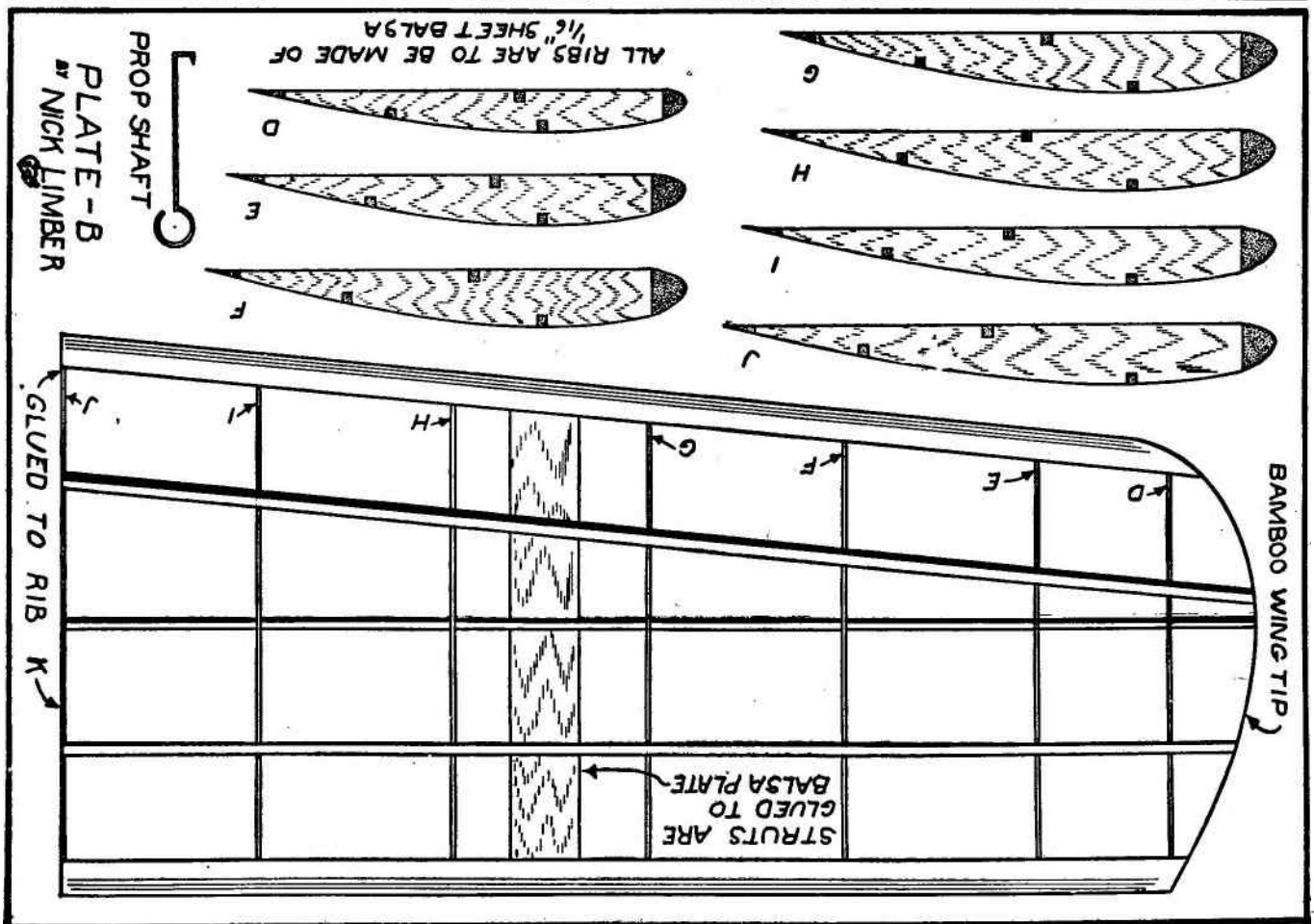
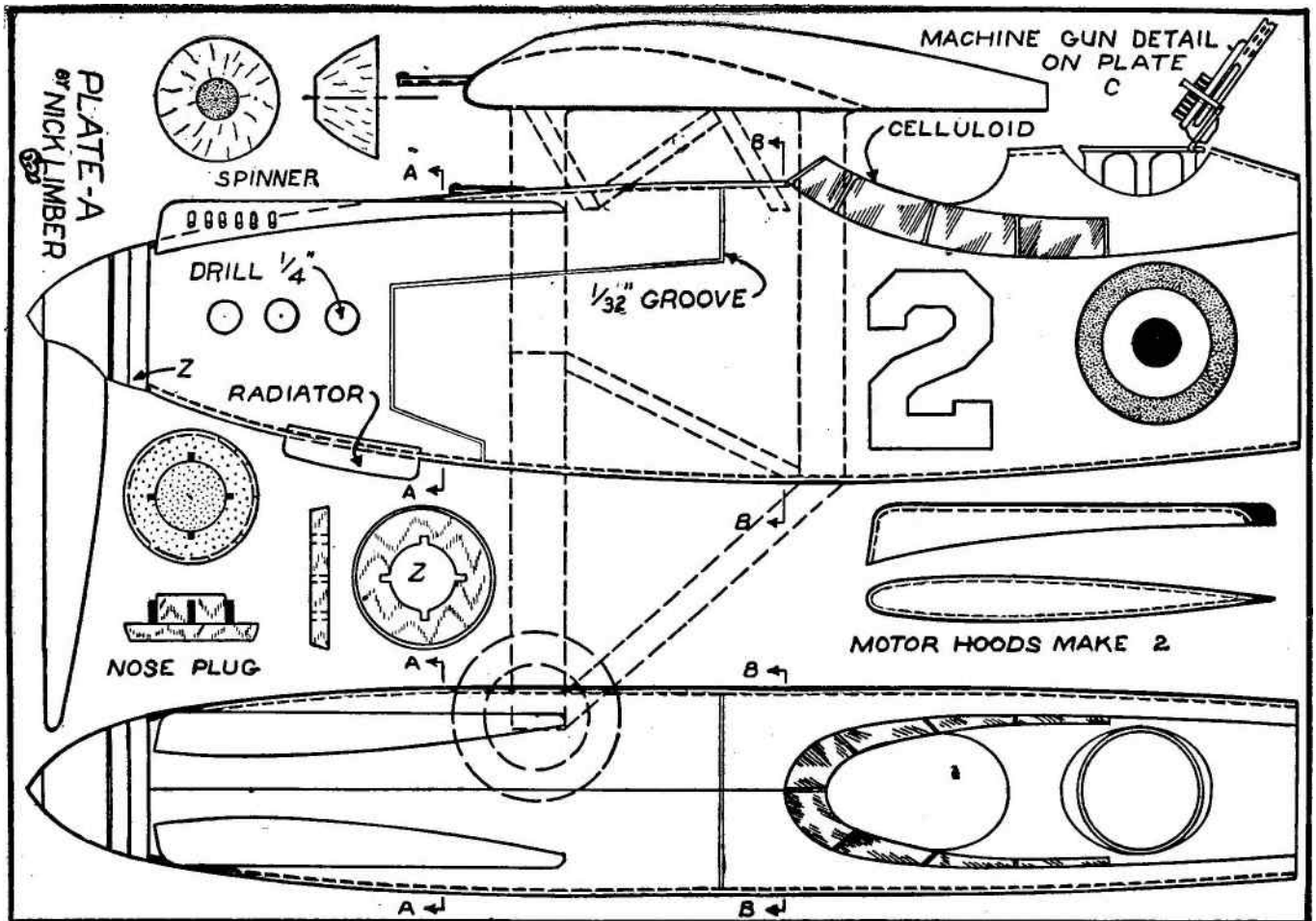
**T**HE rudder and elevators, shown on Plate F, are made of strip balsa with bamboo used as tips. The leading and trailing edges of the elevators are made of  $\frac{1}{16}$ " by  $\frac{1}{8}$ " strip while the rudder and cross pieces on the elevators are made of  $\frac{1}{16}$ " by  $\frac{3}{32}$ " strips.

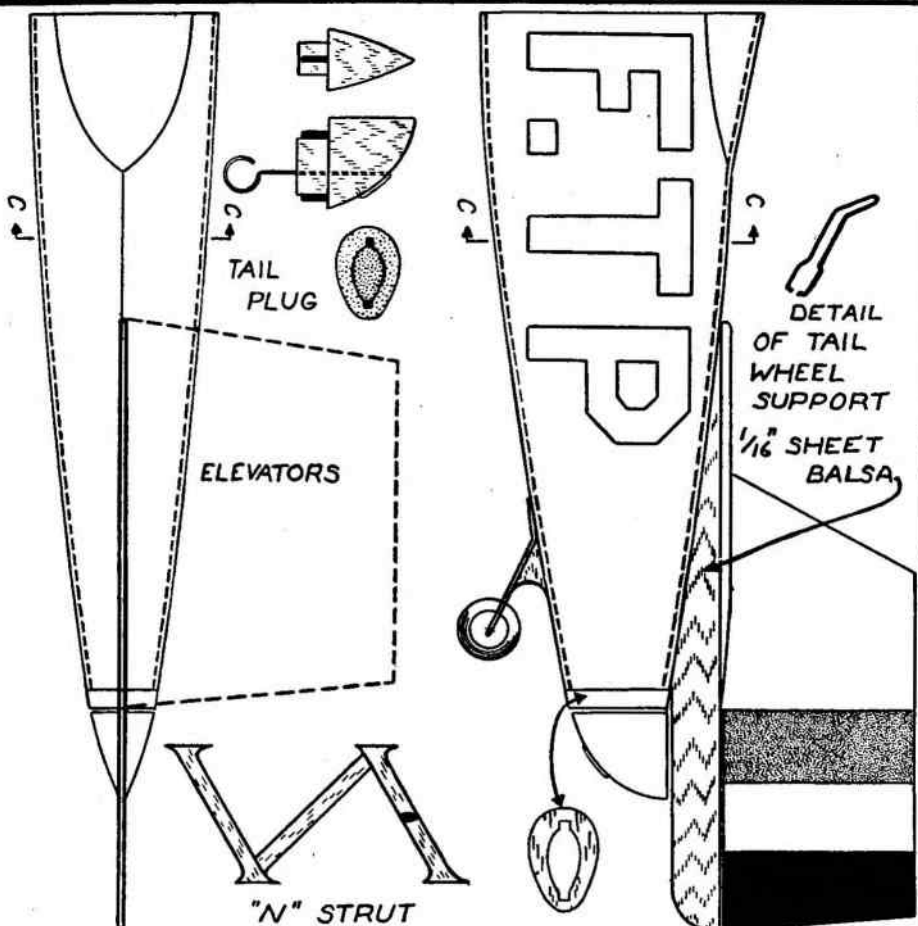
Great care must be taken that the tail surfaces do not warp when the glue is drying. If a flat heavy object is placed over the frame work of the tail surfaces while they are drying, it will insure against warping. When the framework is dry, cover the surfaces on both sides with Jap tissue or Jap silk. I would recommend silk for the builders who wish to have the model for

(Continued on page 93)

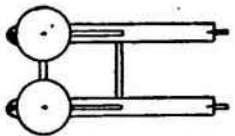


"That's a model as is a model!" we can hear you say. And we of FLYING ACES chime in with a resounding, "You said it!" Nick Limber, author of this article, brought his snappy Nieuport Delage 580 into the F. A. Offices, and, we can tell you it has what it takes—with plenty to spare!



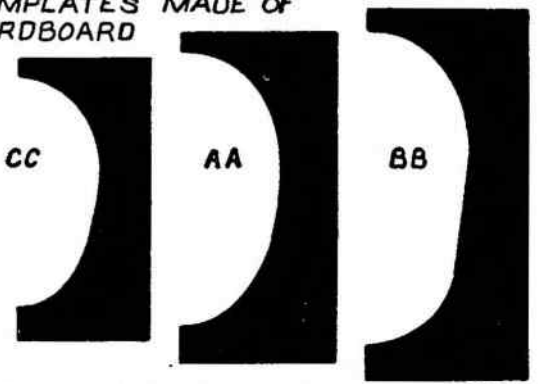


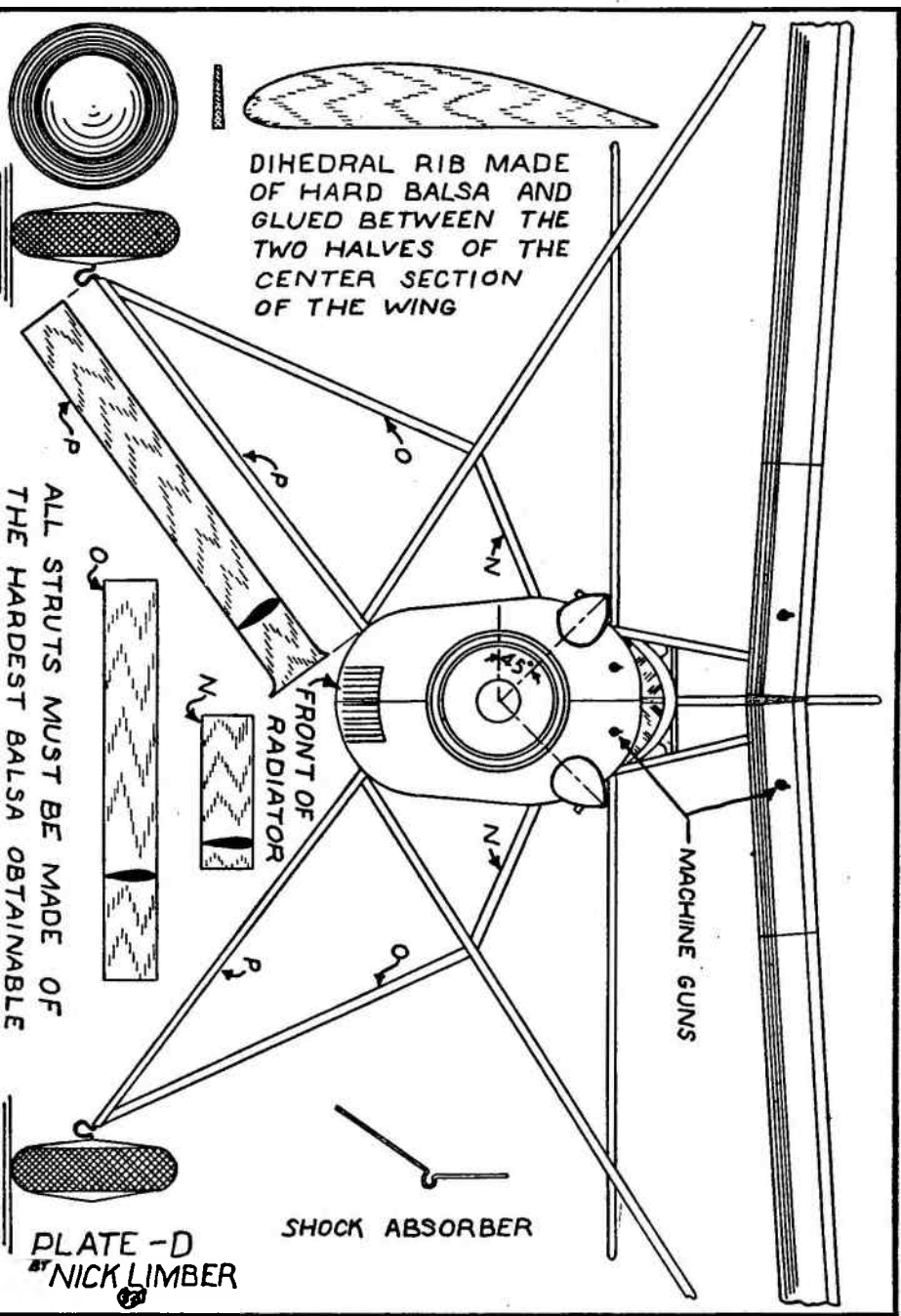
TEMPLATES MADE OF CARDBOARD

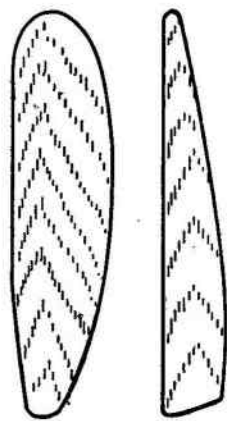
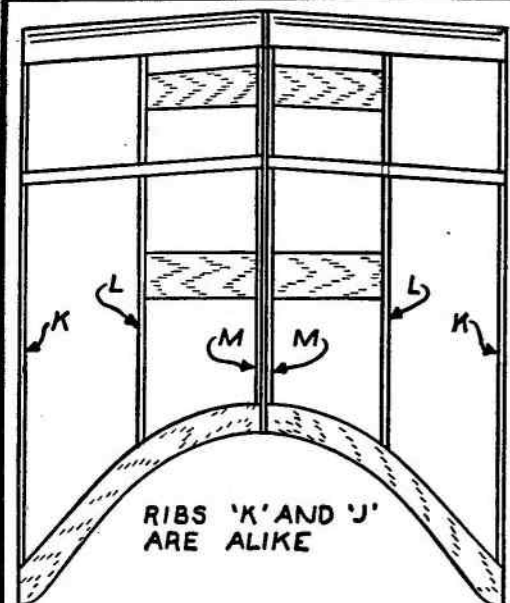


MACHINE GUNS MADE OF BALS

PLATE - C  
BY NICK LIMBER

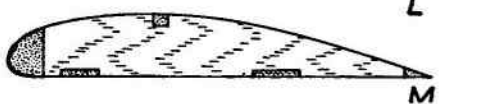
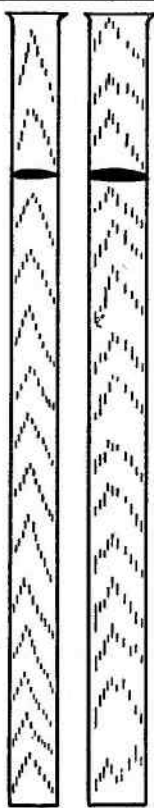




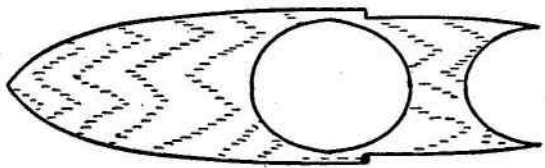


BLADE FOR SCALE MODEL PROP

STRUTS MADE OF HARD Balsa



SPINNER TIP



COCKPIT FORM MADE OF Balsa



TOP VIEW OF PROP BLOCK

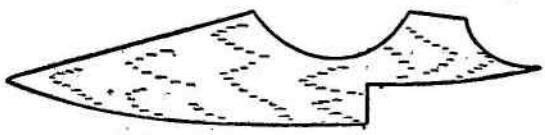
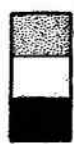


PLATE - E  
NICK LIMBER

'S' HOOK



RED  
WHITE  
BLUE

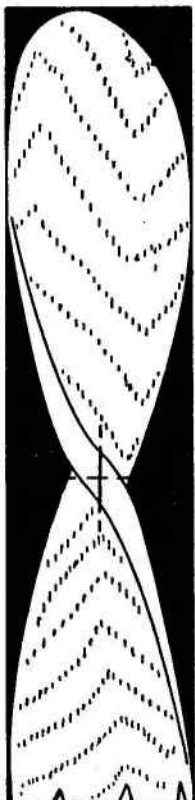
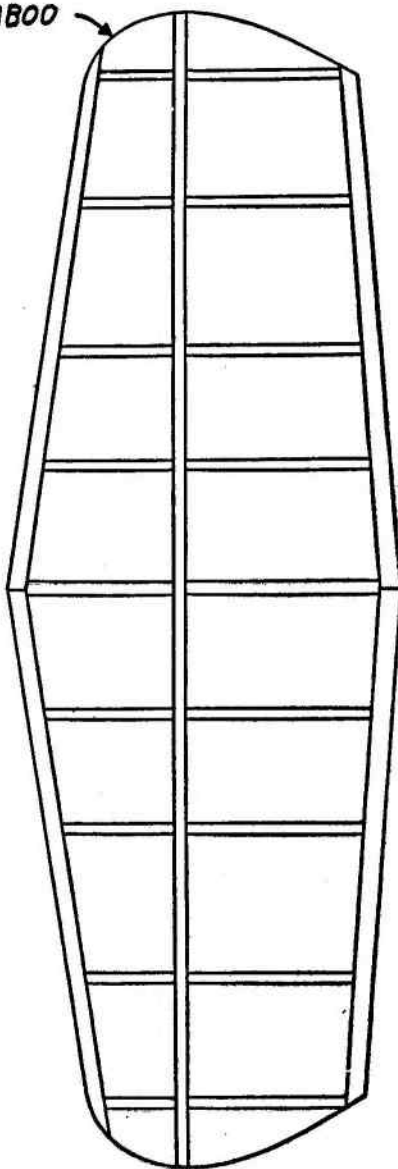
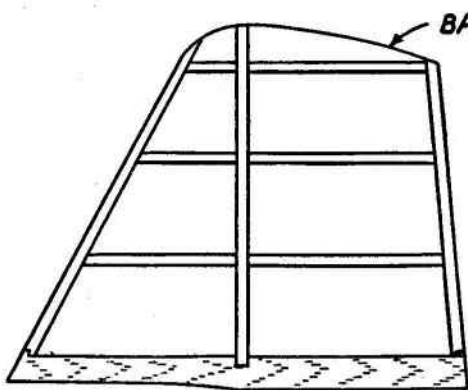


PLATE-F  
NICK LIMBER

FLYING PROP

MACHINE  
GUN  
MAKE 4

# Build the Clark R.O.G. Tractor

Here's a staunch ship with perfect flying qualities that's making a big hit out on the West Coast—an easily built model that will outlast many sets of rubber! This craft comes to you directly from the bench of Jack Clark, one of America's best known builders. For the benefit of you buzzards who haven't logged much solo time yet, Mr. Clark has described every detail of construction. You old-timers, too, will want to add this job to your squadrons.

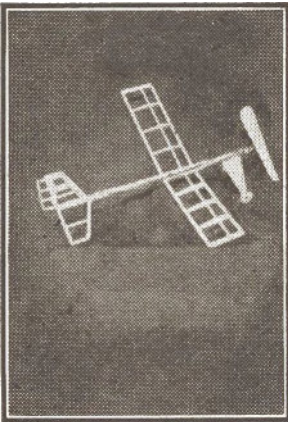


By Jack Clark

Model Plane Record Holder

**H**ERE is a simple r.o.g. tractor model that will thrill you with its consistent flights and its remarkable ruggedness. It's the real answer to the search of many builders for a light, easily-built model—one that costs very little to make and will outlast many sets of rubber.

This plane was evolved from one of the official designs used in the recent model-building classes held in the Meier and Frank store, Portland, Oregon. It has proved highly successful due to its ease of construction and dependable flying qualities.



In this "shot," we've removed the wing and tail covering to show you the construction details of the Clark Tractor. Compare this picture with the sketch of the model at the bottom of Sheet 1 of the plans.

## SUPPLIES

**T**HE following supplies are required (all wood used is medium hard balsa): 4 pieces  $1/16'' \times 1/16'' \times 9''$  for wing edges; 1 piece  $1/16'' \times 1/16'' \times 24''$  for tail parts; 2 pieces  $1/16'' \times 1/8'' \times 9''$  for wing spars; 1 piece  $1/16'' \times 1/8'' \times 24''$  for tail parts; 1 piece  $1/8'' \times 3/16'' \times 1 3/4''$  for landing gear and rear hook braces (*b* and *c* on plans); 1 piece  $3/16'' \times 3/16'' \times 2 1/2''$  for

wing center block (*k* on plans); 1 piece  $3/16'' \times 1/4'' \times 15''$  for motor-stick; 1 piece  $1/2'' \times 11/16'' \times 6 1/2''$  for propeller block; 1 piece  $1/32'' \times 3'' \times 10''$  sheet for ribs, wing-tips, center block sides, and landing gear struts; 1 piece  $1/16'' \times 2'' \times 8''$  sheet for wing-root ribs, wheels and axle bar; 1 light propeller hanger; 7 small brass washers; 6 inches of No. 8 (.020) music wire for propeller shaft, tail hook, and skid; 1 piece Japanese silk tissue, 12 x 18 inches;  $1/2$ -ounce bottle clear model cement;  $1/2$ -ounce bottle of banana oil; 2 feet  $1/32'' \times 1/8''$  flat rubber; 1 two-inch rubber band for holding wing on body; 2 common pins for wheel axles; and light silk thread for bindings and for rudder controls.

## BUILDING THE STICK FUSELAGE

**F**IRST take the 15" motor-stick and cut out a space at one end  $1/16$ th inch deep by  $2 1/2''$  long, into which the stabilizer is to be morticed (Plan No. 2). The side with the cut will hereafter be considered as the bottom of the motor-stick (*a* on the plans).

From the  $1/8'' \times 3/16'' \times 1 3/4''$  piece, cut off with a new razor blade the piece, *c*,  $1/4''$  long and cement it to the opposite side, or top, of the fuselage  $2 5/8''$  forward from the rear end, as shown. Form the rear rubber hook, *d*, and insert the shank into the motor-stick and cement to *c*. Bind with light thread and coat the joint with cement.

The remainder,  $1 1/2''$  long, of the  $1/8'' \times 3/16''$  piece, is used for the landing gear brace, *b*, which is shaped as shown on Plan No. 1. Cement it to the bottom of the motor-stick, one inch back from the front end. Cement the propeller hanger, *e*, to the top of the motor-stick, after cutting out a slight groove in *a* so that its shank will make a neat fit flush with the top of *a*. Bind with thread and cement as was done with the tail hook.

From the  $1/16'' \times 1/8'' \times 24''$  piece, cut off two pieces, *f*, one inch long each, and cement them to each top edge of *a*, in the position shown on Plan No. 2. These pieces should be flush with the sides of *a*, so that the fin can be cemented between them when it is assembled to the motor-stick. Their purpose is to brace the fin.

## LANDING GEAR

**F**ROM the  $1/32''$  sheet balsa piece, cut out the landing gear struts, *g*, (Plan No. 1), and be sure to have the grain running parallel with the front edge of the struts. Sandpaper the bottom end of the struts slightly concave to form a snug fit over the cambered surface of the bottom cross-bar, or axle bar, *h*, whose cross-section is shown by A-A, Plan No. 1.

Cement the struts to the wedge, *b*, and to the motor-stick and then cement the axle bar, *h*, to the struts.

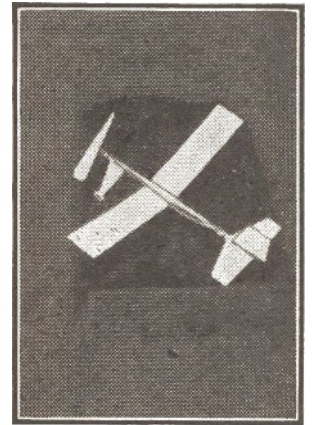
Cut out four  $1/16$ th inch sheet balsa discs for the wheels, and cement two discs together with the grains at right angles for each wheel. Sand the surfaces of the wheels smooth with light sandpaper, then round off and smooth the rims. Put a hole through the center of each wheel and cement a washer to each side. Use common pins for axles; and after the wheels are on, bend as shown at *h-1*. Bind and cement the pin axles to the bottom of *h*.

Form the tail skid, *i*, and cement it to the rear end of *a* as shown, after pushing its shank into the end of the motor-stick (Plan No. 2).

## EMPELLAGE

**B**UILD up the tail frame, shown on Plan No. 2, over the full size drawing, holding the pieces accurately in place with pins until the cement is dry. Have wax paper between the balsa and the drawing or tracing of it, so that the cement will not stick to the plan and in order that the frame can be lifted up easily when set. After the frame-work is dry, remove from the jig and

(Continued on page 95)



And here's this neat r.o.g. job all set for a quick take-off and long flight! Yes, it's a rugged flyer—one you can schedule for regular trans-backyard journeys. Its dependability ought to win it your best mail contract!



This is top-flight photography, and no mistake! With this excellent photo, it isn't hard to get your imagination working. You can fancy yourself pausing at a spot along the Arabian Coast en route, let us say, from Nairobi to Baghdad, your speedy Supermarine riding at anchor on the inlet, awaiting resumption of the flight.

★ ★ ★



How about taking "shots" of your models in miniature, true-life settings? A few "props"—simple things you can pick up around the house—are all you need to lay out the scenes, and the accompanying article gives you full instructions how to do it. FLYING ACES would like to see how you make out, so trip the trigger on a few settings and send in the prints for our model photo page. Next month we'll have an article telling you how to photo model planes in an air fight scene. Don't miss it!

★ ★ ★

# Photo Your Models in Movie-Type Settings

**G**ET together a few "props"—a large mirror or piece of window glass, some sand or plain dirt, and a few short, well-proportioned tips of branches from a tree or bush. Now start your gray matter to working and you can devise a setting that will appear, when photographed, like a real outdoor scene.

Suppose you have a seaplane model, like our Supermarine S6-B, and you want to picture it in a scene similar to the one shown above. Here's what you do: First procure a flat surface to work upon, one measuring approximately  $3\frac{1}{2}$  ft. wide and perhaps 5 ft. deep. Next, place your mirror, or window glass, at the end toward you to represent the water. Some brown cloth or burlap bags will serve to make the ground and dunes for the background sloping down to the water. Then place enough sand or dirt over the bags to eliminate the appearance of the coarse threads and enough at the shore line to make it look natural. In placing your trees, be sure to place the taller ones in the front towards the shore and the smaller ones in the back. This will give you the correct perspective. You can, if you wish, get miniature trees, and other props, too, at any ten cent store.

Your plane should be placed on the glass about one foot from the

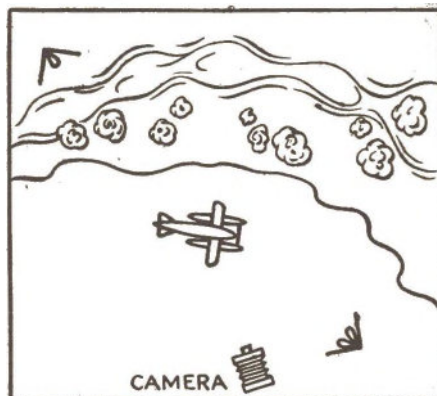
shore line. The background behind your "set" should be a solid-color or plain paper wall, or you may use a sheet so that windows or other indoor objects will not show in your picture. You are going to have a lot of fun preparing your "set"—making your hills, placing the trees, and proportioning your layout. This is the way many "sets" are made for the movies.

With your "set" completed, you are ready for your picture. You will need two or three photoflood lamps (they are inexpensive) to get proper illumination. Place an ordinary floor lamp to the left side of your "set" and slightly back so that when the lamp shade is tilted up the light will illuminate the entire "set." Be sure

that this light does not shine into the lens of your camera. Place another floor lamp in front of the "set," slightly away from the center and to the right. One or two photoflood bulbs should be used in this lamp. The accompanying diagram shows how to place your lights and camera. Best results will be obtained by using super-sensitive panchromatic film.

To take a snapshot with the camera in your hands you will have to use a camera with an  $f. 6.3$  lens, setting the shutter for  $1/25$  of a second. Or, you can set your diaphragm opening at  $f. 11$  and your shutter speed at  $1/5$  of a second—

(Continued on page 93)



Here's the way the realistic scene shown at the top of the page was "shot." The diagram gives you the correct layout for camera, ship, lights, and stage "props."

# Make the Boeing Bomber

First with the latest! FLYING ACES "scoops" the field with the first full instructions for building a model of the ship you've all been hankering to wield your tools on—the sky-hurting Boeing Bomber. Here's your opportunity to be the first on the model tarmac with this famed craft.

\*\*\*

By Joe F. Battaglia

**H**ERE'S what you've been waiting for—a three-view layout of the Boeing Bomber, type 299, together with instructions for building a solid scale model.

This ship—a veritable flying fortress—is powered by four Hornet engines of 700 h.p. each. It's considered by experts to be the deadliest aerial fighting craft ever built.

The ship, at this writing, has already passed intensive preliminary flight tests and has been pronounced "fit." It has now been sent to the annual Army competition at Wright Field, Dayton, Ohio, where it will be pitted against other new planes, such as the Martin "mystery" Bomber and the new Douglas.

The "299" has many interesting features, the most outstanding being the four gunner's "blisters"—fighting cockpits strategically placed on the fuselage to cover all angles of enemy attack. One of these is on top of the body immediately behind the fairing leading from the pilot's "office." Another is underneath the fuselage, slightly aft of the top one. And two others are located on each side of the fuselage aft of the lower blister (see photo and drawings). There is also a gunner's pit built in the nose of the ship, which affords a wide range of visibility.

Another feature is the ship's huge size—105 ft. of wing and 70 ft. of fuselage. On its wheels and skid, the craft has a height of 15 ft. The bomber weighs 15 tons, and it is estimated that it will carry fifteen 1,000 lb. bombs a distance of 6,000 miles (non-stop) at a speed in the neighborhood of 275 m.p.h. Another feature is the set of four 3-bladed, 10 ft. diameter, variable pitch props. These can be adjusted in flight to meet various conditions of flying efficiency.

## NOW TO BUILD THE MODEL

**I**F you follow the instructions carefully, you should be able to turn out a neat solid-model job. So buckle

down to work and let's see what you can do.

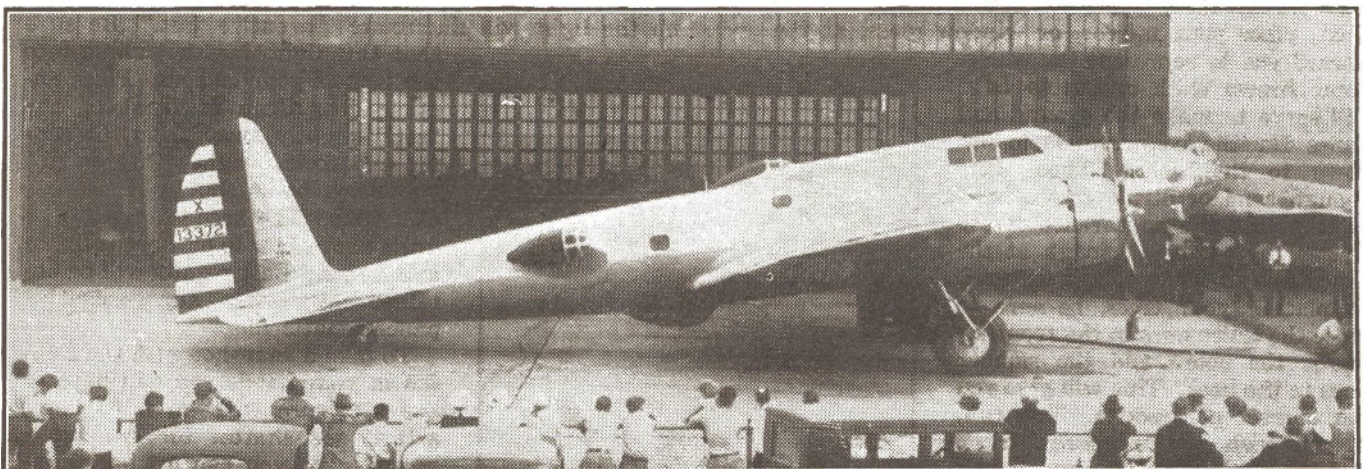
It is best to make templates for all the main parts before starting to cut any wood. These may be made from stiff paste board, Bristol board, or the like. First, trace fuselage, wing panels, empennage surfaces, motor nacelles, and pilot's "office" fairing on tracing paper. Then lay these tracings with penciled sides against the stiff template paper, and trace the lines all over again. When finished, you will find that the pencil marks have been transferred to the stiff paper. You only need to make templates for one half of each section—fuselage, engine cowl, and nacelles.

Now cut out all the templates. When through with this operation, trace around the outlines of the wing, tail surfaces, and pilot's pit fairing. Cut out the wooden parts one by one and plane and sand each to the proper shape.

Coat each piece with three layers of aerodope or banana oil, allowing each coat to dry, and sand after each drying. Now cut five squared blocks of wood, with the outside dimensions conforming, respectively, with the following sections as shown on the drawings: fuselage, engine nacelles, and cowling.

If you have no lathe, shape out your fuselage with the usual tools, with frequent reference to your template. If a lathe is accessible, draw two lines cross-corner at each end of each piece to find the centers. Next, run the steel center pins of the lathe against the two opposite center points on the block to be spun. Start the lathe in motion and with your cutting tool pressed against the tool-rest cut lightly into the speedily revolving block of wood. Work it down to the shape of the fuselage, and at frequent intervals place the template against it to make corrections until it is accurately completed. Now go over the revolving piece with fine sandpaper until the surface is smooth. Then take it out and go on to the nacelles and cowl, repeating the operation

*(Continued on page 94)*

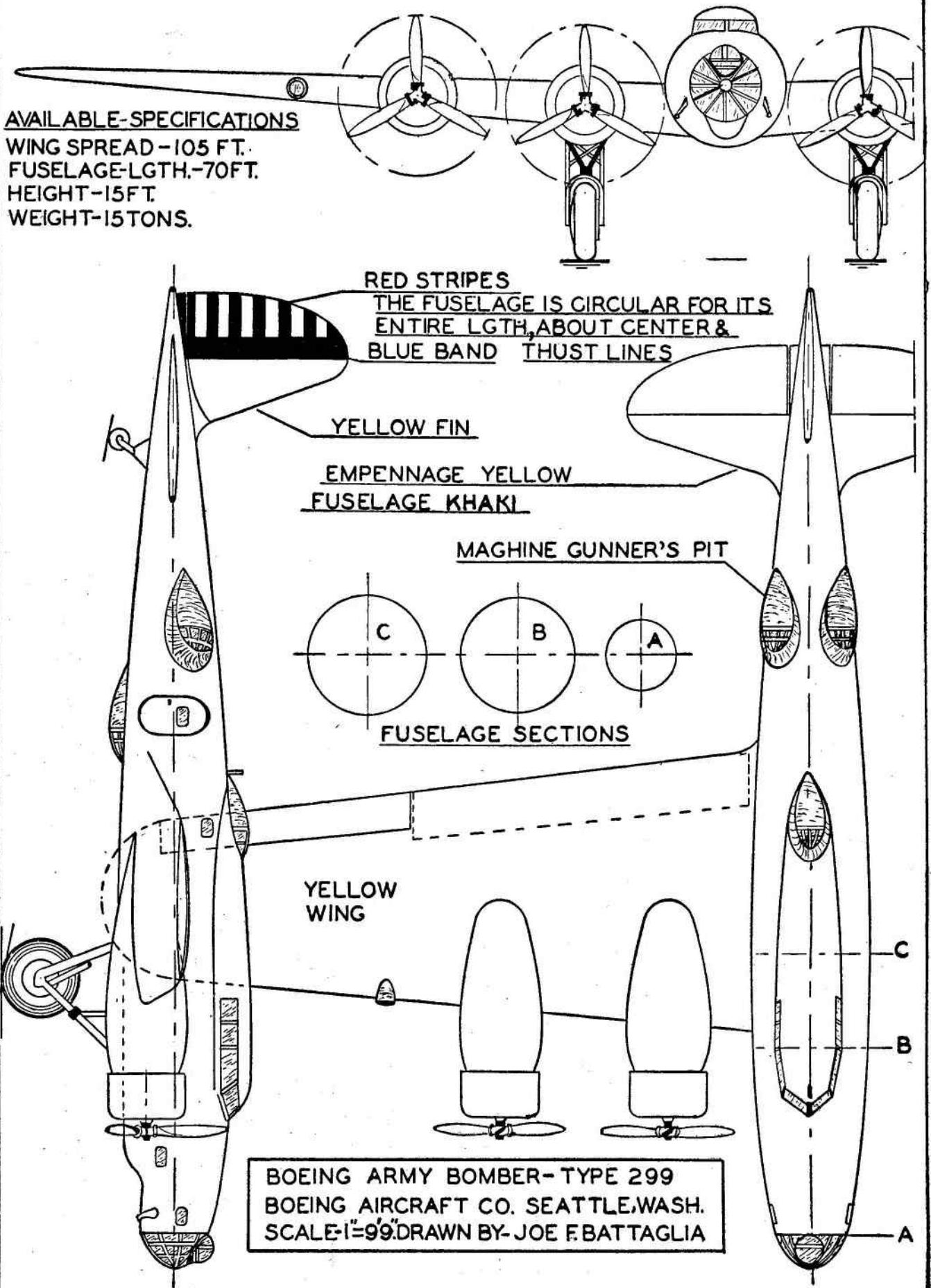


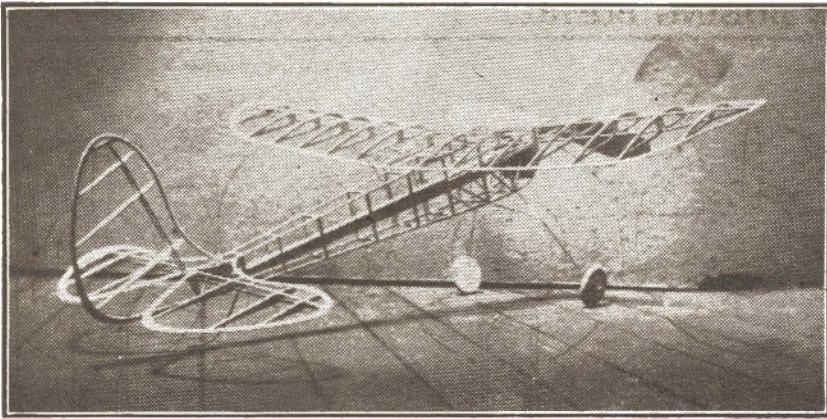
And here's the Boeing Bomber "in person"—the famous job that promises to win its spurs as the fastest and longest range bomber ever built. Equipped with variable-pitch props, retractable landing gear, two-way radio telephone, automatic pilot, a radio homing device, and a host of new armament installations—it's got everything in the book!

# THE BOEING BOMBER

## AVAILABLE SPECIFICATIONS

WING SPREAD - 105 FT.  
FUSELAGE LGTH. - 70 FT.  
HEIGHT - 15 FT.  
WEIGHT - 15 TONS.





*It almost looks as if you'd have to put your knee on this one to hold it down—it might fly off before you get the covering on! And while you're about it, study this photo carefully. It'll help you in building the model.*

# Presenting Scrambola II!

By George Ivey, Jr.

**S**CRAMBOLA II was designed with two characteristics in mind—stability and simplicity of construction. The model that resulted, quickly proved that both qualities had been achieved. From its first powered take-off, Scrambola II climbed at an usually steep angle without a stall and spin—and subsequent flights showed that this stability was inherent. The ship will also glide well; in fact, it will soar when weather conditions are right.

## CONSTRUCTION DETAILS

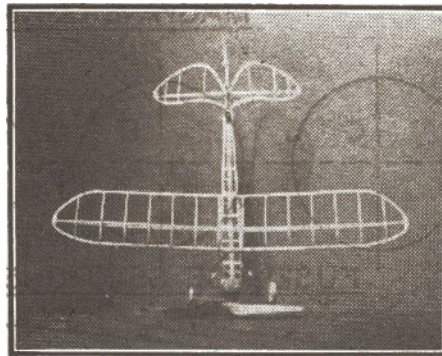
**J**OIN Plate 1 and 2 together to form the full size layout. Now cover the drawing with wax paper to protect it from the glue. Carefully cut and sand the longerons and spacers to correct size, as shown on the drawing. Assemble each side on the drawing, holding the pieces in place with pins. When both sides are completely dry, attach them together and install nose block. The easiest way to make this is as follows: Cement two 15/8" x 25/8" x 7/8" soft balsa blocks together, carve to correct outside shape, split apart, carve out the inside, and cement together again. Be sure to select medium soft balsa.

Bend the landing gear to shape from 1/32" music wire, and make the wheels of medium balsa 1/8" x 2". Equip wheels with paper bushings.

The tail surfaces are of all-balsa construction. Cut the outlines and ribs from 1/16" sheet and the spars from

1/16" sq. The stabilizer spars are continuous, and both stabilizer and rudder are attached to fuselage before covering.

The motor stick is simple and strong. Cut and sand the parts (two sides, cap strips, end plugs, and bulkheads) from



*This snapshot brings out the design details of the wing and elevators. Compare it with the "shot" at the top of the page.*

medium balsa and coat with dope or banana liquid before assembling. After thrust bearings and rear hook have been attached, cover entire stick with Jap tissue and give two coats of dope.

For the wing, scale up the half size plan of Plate 3 and assemble the wing on the drawing in somewhat the same manner as the fuselage. The top pattern is shown full size, and the outline is cut from 1/16" sheet.

Scrambola I, the original zippy sky traveler of that name, proved to be such a good thing that designer George Ivey, Jr. decided to "stick with it"! So here's Scrambola II—and you'll have to be ready to run when this job takes off, for, as he tells us, she "wasn't named Scrambola for nothing"! Yep, this one is certainly the ace—at least until Scrambola III comes along.

Cover the entire model with a good grade of Jap tissue, spray with water, and when dry apply two coats of thin model dope. You may use any color scheme you wish. The original model had red wings and stabilizer, with blue fuselage and rudder.

## PROP AND POWER

**C**ARVE the prop from a 12" x 1" x 2" medium balsa block. Be sure to blank it out exactly as shown on drawing, as the pitch depends on this. Sand the blades smooth, balance, and dope. The free wheeling is of the well known spring type and is clearly shown on the drawing.

Power the model with from eight to ten strands of 1/8" flat rubber (lubricated). Two "S" hooks complete the power plant, and these are equipped with rubber tubing to prevent the wire cutting the motor strands.

## FLYING

**T**HE wing is held on the fuselage by a rubber band tight enough to prevent any form of slippage. Adjust the wing so that the model glides evenly, then give the motor about 200 turns for a trial flight. Now wind to capacity with a winder, set 'er down on any fairly smooth spot, turn the prop loose, and get your running pants on, 'cause this model wasn't named Scrambola for nothing!

## Winners of Missing Words Contest No. 17

First Prize, OLA A. SATER, Staten Island, N. Y.

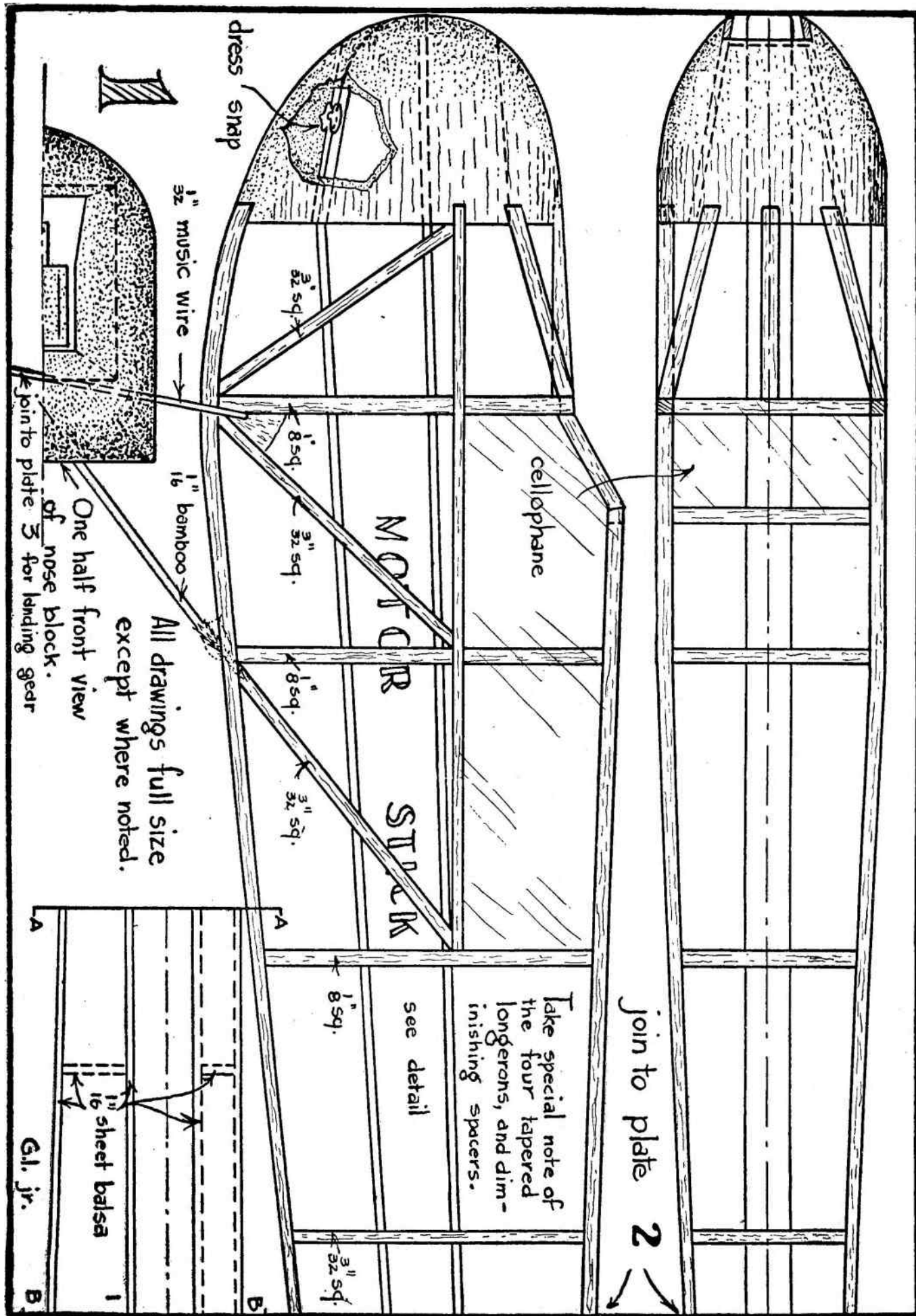
Second Prize, JAROSLAV CHMELICEK, Chicago, Ill.

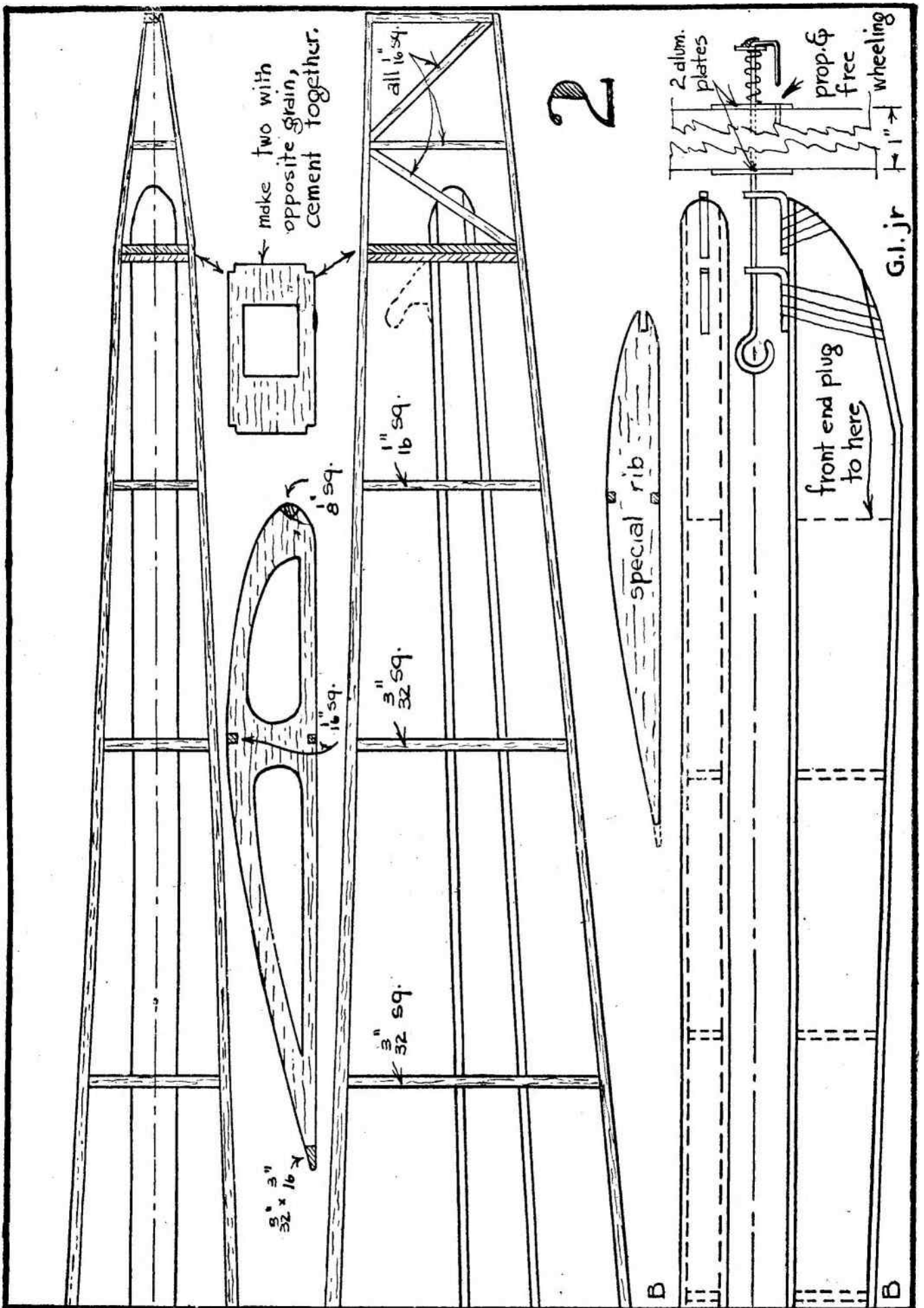
And Three Prizes, BUDDY MARSHALL, San Francisco, Cal.; BUCK WILDING, Washington, D. C.; and PAUL ECKER, Cleveland Heights, Ohio.

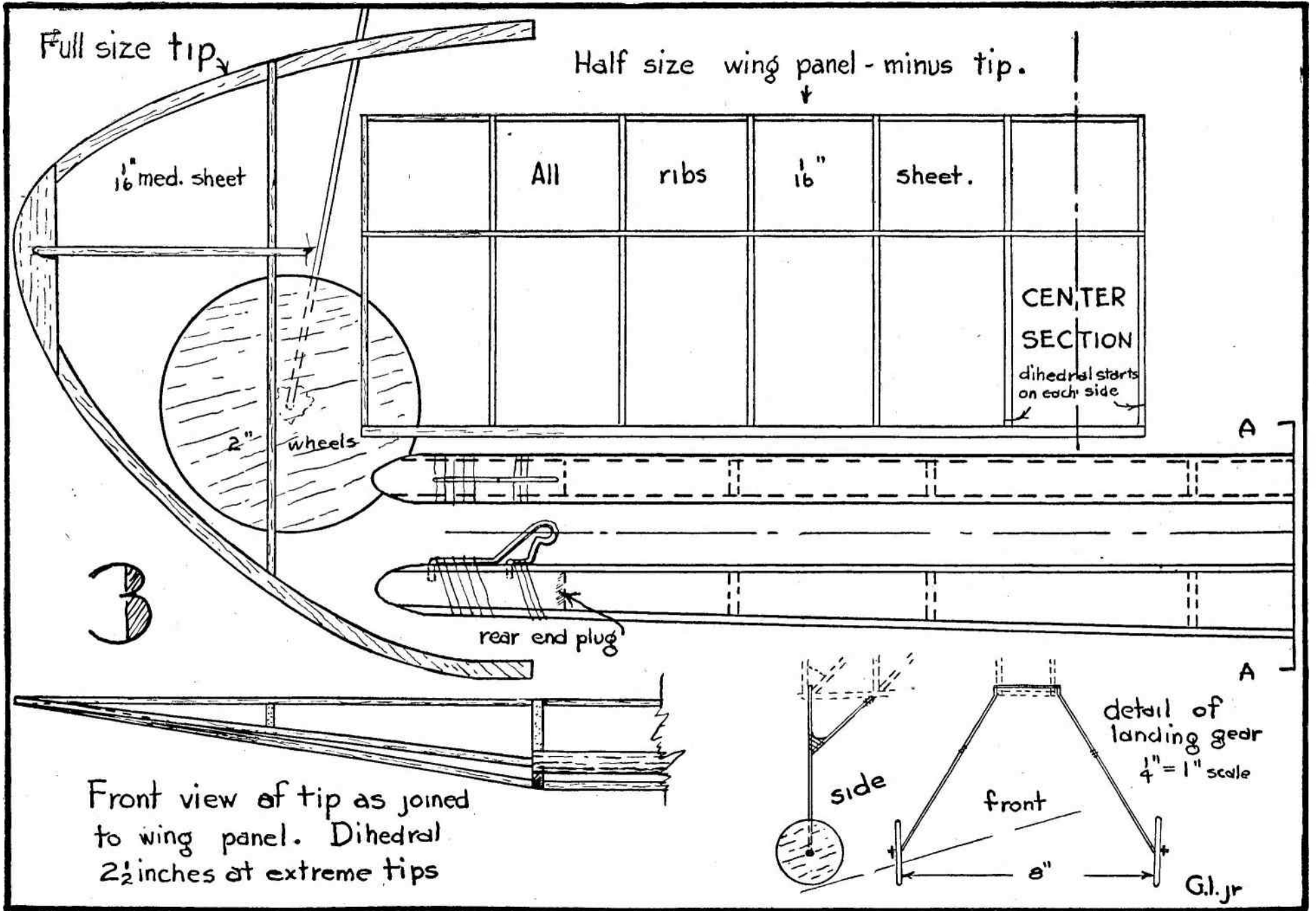
Honorable Mention, HERBERT GREEN, ALBERT DISTEFANO, KENNETH KEMPF, G. H. CARON, JOE CHAPMAN, GEORGE SLONE and FREDERICK BASTIAN.

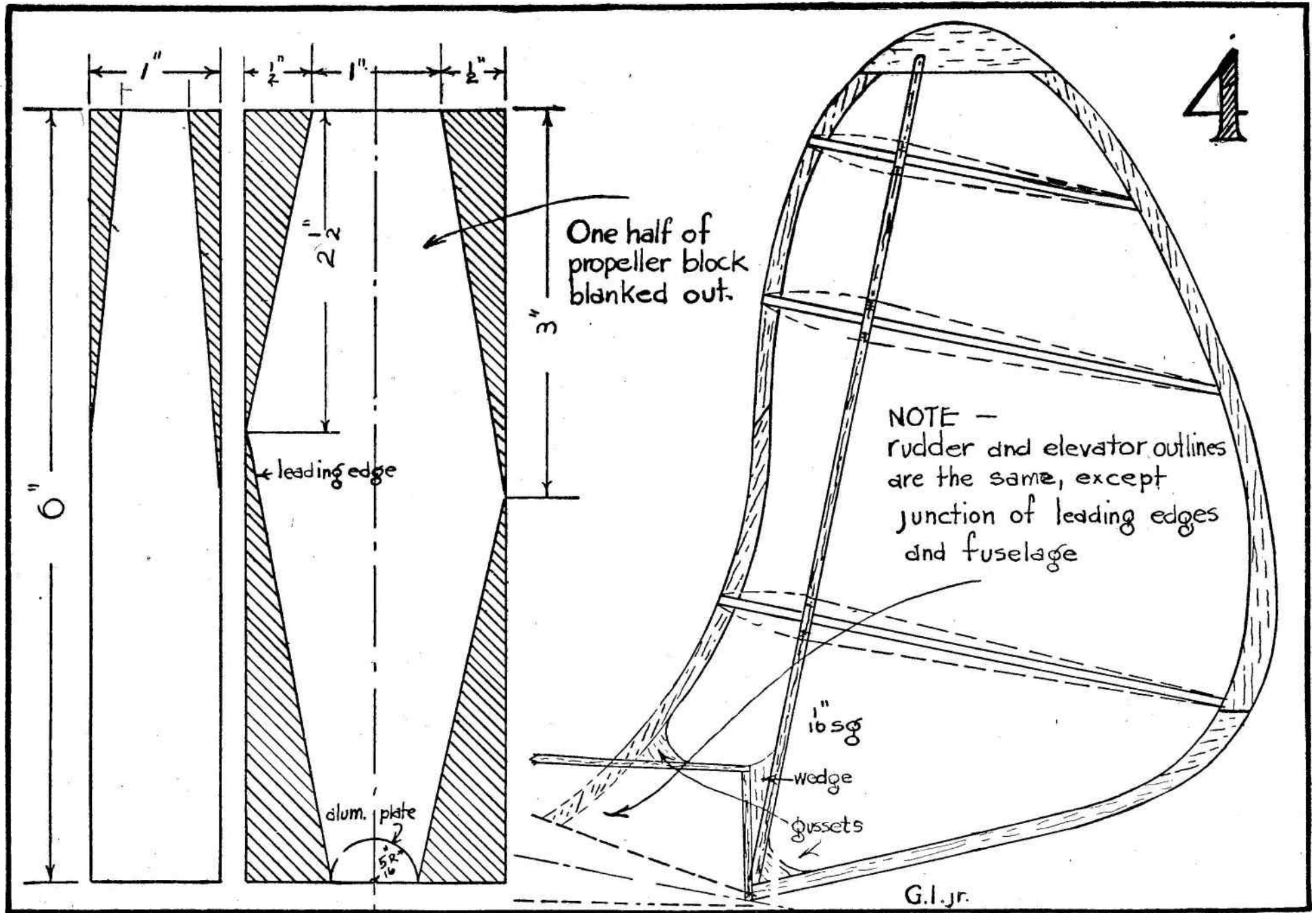
This Contest Appeared in the September FLYING ACES





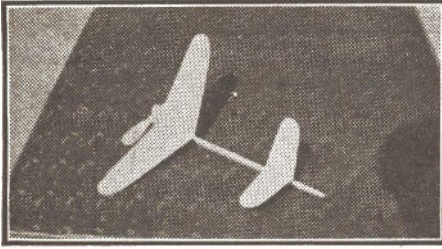








# Flying Aces "Powered Pusher"



Ready for the air! This front quarter view of the "Powered Pusher" shows how the stick fuselage protrudes—a feature which will prevent many a wing crackup.

With the recent development of the snappy Hammond "Y," aero eyes are again trained on pushers. So we keep pace by offering you a fast-flying powered pusher—a ship which Mr. Unrath tells us features the same excellent stability possessed by our FLYING ACES pusher gliders.

Good luck!

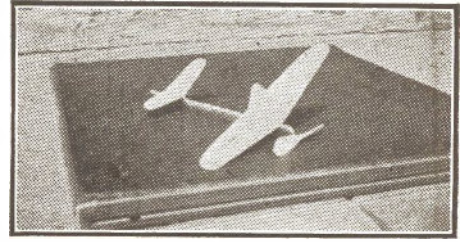
★ ★ ★

By Julius Unrath

**M**ANY of my readers will remember the uncanny stability possessed by the pusher gliders presented in previous issues. This "Powered Pusher," not unlike the others, offers the same inherent stability common to the gliders. In order to make the construction easier for the beginner, the "Pusher" is built completely of balsa. For the more advanced builder, the model may be built-up, covered, and fitted with a larger propeller. (See plans on following two pages.)

#### CONSTRUCTION DETAIL

**B**EGIN by shaping the motor stick from a piece of  $\frac{1}{8}$ " x  $\frac{3}{8}$ " x 12" balsa. After this has been sanded thoroughly, the hook, can, and thrust-bearing are to be firmly cemented in place. The elevator is now cut to shape from a sheet of  $\frac{3}{32}$ " x 2" balsa. This is sanded to the proper airfoil shape and cemented to the elevator mount, which in turn is cemented to the proper place on the motor stick.



Clean lines plus! Note how the rudder has been mounted on the wing and how dihedral has been given to both wing and elevator. A nice job!

The wing ( $\frac{3}{32}$ " flat) is constructed and attached in the same manner as the elevator. A rudder ( $\frac{1}{16}$ " flat) is cut to the shape shown in the drawing (see Sheet 2) and cemented to the top center of the wing. Use dihedral,

as shown in the accompanying photos, on both elevator and wing.

The propeller is 5" in diameter and, for the beginner, should be bought from a reliable supply house. Power may be varied from 2 to 4 strands of  $\frac{1}{8}$ " flat rubber.

The model will glide with the airfoil surfaces in the positions shown. The elevator, however, may be moved forward or backward, or weight may be added to obtain longitudinal stability. As usual, test with a few glides before revving up the prop.

Please enclose stamped, self-addressed envelope when asking for information, and send your letter to me personally in care of FLYING ACES Magazine.

## From the Model Builder's Workbench

#### WINDOWS OF ALL TYPES

**M**ANY builders of solid scale models are troubled by the lack of realistic wheels for their planes. The five and ten has cheap toy cars with rubber-tired wheels of one half to one inch in diameter which can be used on solid models. Whether your plane is the type requiring wheel pants, or is a model without streamlining, the toy wheels will give it a realistic look. The hubs are usually small, so they look very much like the plane wheels now in use.

Another touch of realism can be added to any cabin type plane by putting in real windows. If you want a row of windows with narrow divisions between the panes, install the windows on the model in the following way. Cut a rectangular hole or mortise, through the fuselage where the window section comes, making the hole just a bit longer and wider than your window space is to be. Paint the inside a dull black, either with paint or black ink. Cut a strip of celluloid slightly larger than the size of the rectangular window-section hole. Also cut a shallow recess the same size as the celluloid around the mortise so that the celluloid covers the mortise and lies flush with the outside of the fuselage. Then cement it in place. Repeat this process on the other

side. After the cementing, the window frames can be painted in with enamel, and you will have a very good-looking set of windows.

On planes of the S-42 type, or the Boeing Transport, where the windows are small and round, or oblong, a different method can be used. In this case, the fuselage is made of two pieces of wood put together with ordinary glue. The fuselage is shaped from this block so that when finished, the seam runs down the center, and vertically in relation to the plane. After shaping, soak

the block in warm water to soften the glue, so that you can separate the two halves. On the outside of each half, the windows should be cut, or burned with a red hot rod filed to the correct shape. With a narrow chisel, hollow out each half where the windows are to come. The inside should be cut out until there is less than a sixteenth of an inch of thickness around the windows. This seems difficult, but with a little care, it can be done. Celluloid is cemented on the inside of the windows, and the fuselage sections are put together again. The whole process is much easier than it sounds, and the resulting windows will be suitable to a model made with the finest detail.

As a final suggestion—when painting long, thin stripes, or outlining control surfaces, use a draftsman's ruling pen, with enamel or black ink. This makes possible a perfect job of striping of any width, color or shape.

ROGER GROUT.

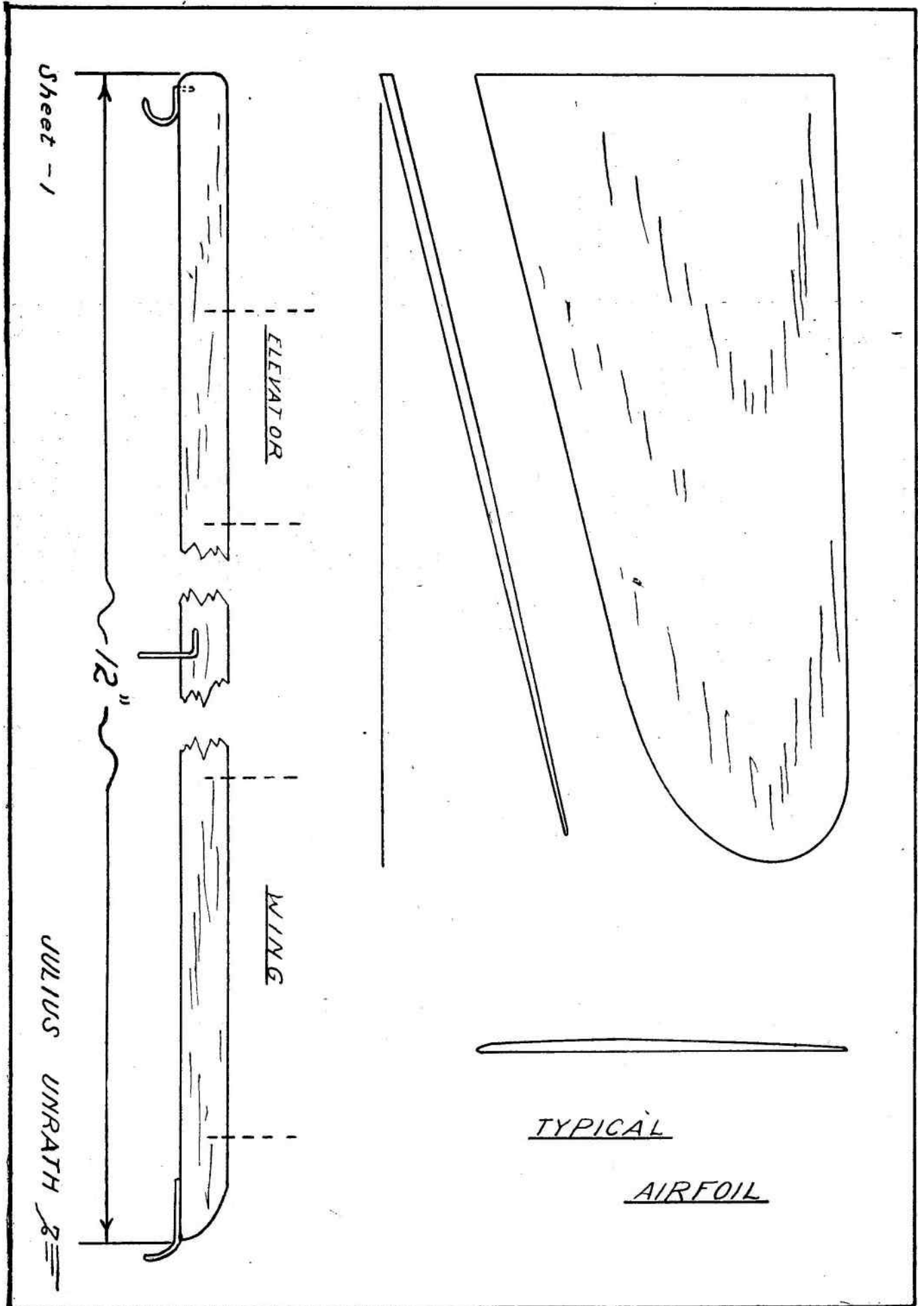
#### THOSE FINISHING TOUCHES

**C**LEAR gum lacquer is one of the best finishing materials you can find, and it costs no more than banana oil. If you get the straight gum lacquer, it will be almost as thick as model cement, and you will have to thin it with

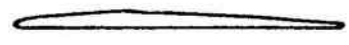
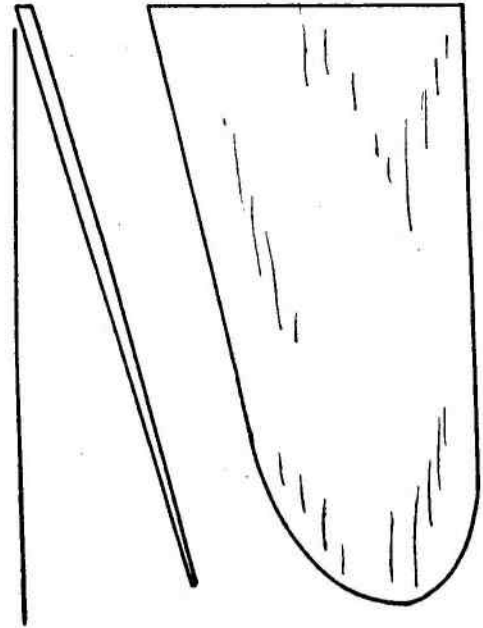
(Continued on page 51)

### Attention, Model Builders!

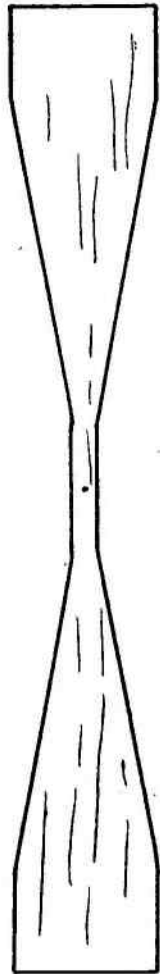
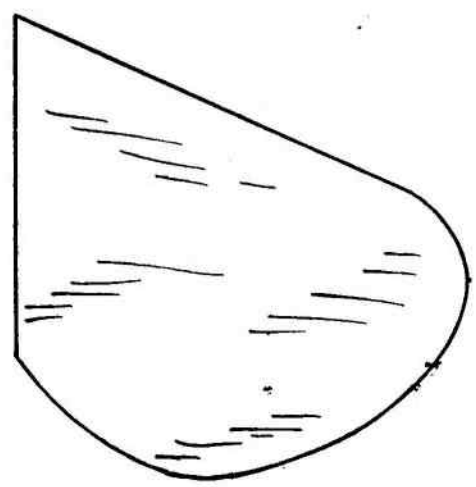
FLYING ACES wants plans and directions for building flying scale models of the latest modern planes. In order to be printed in this magazine, drawings must be done in India ink, and must fit a 7 x 10-inch page. Plans should not exceed six pages. Photographs of completed models must accompany plans. Send in your work, model builders, and get it printed!



Sheet - 2



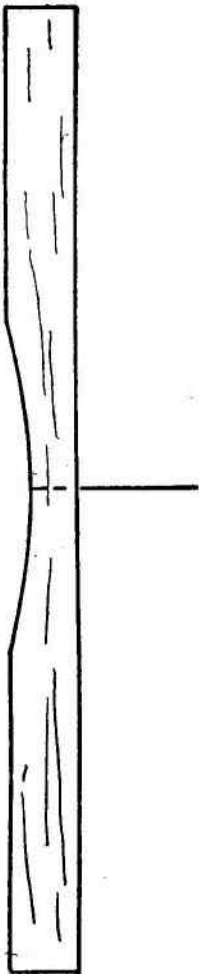
TYPICAL  
AIRFOIL



FRONT



WING  
MOUNT



FRONT



ELEVATOR  
MOUNT

WILLIUS UNRATH 

# Flow of Air Around Bodies

## AERODYNAMICS SIMPLIFIED— IV

This month, Mr. Zier explains the principles of air flow governing bodies in flight and traces the development of the theories of streamlining. By careful reading of this article, you will be able to visualize the varied air flows affecting your flying models. The author will discuss modern theories of airfoil lift in next month's article. Watch for it!

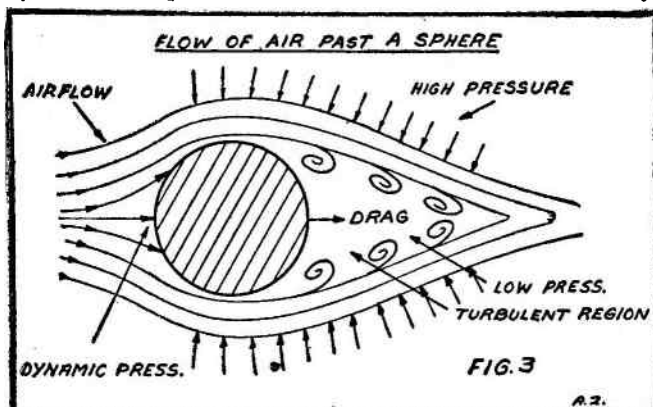
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By Avrum Zier  
Model Department Editor

**C**ONSIDER a fluid which has no viscosity (internal resistance)—a fluid in which every molecule is a separate and distinct particle. In such a fluid, all objects regardless of shape or size would move in perfect streamline fashion and would experience no resistance or drag in doing so. There is no such a fluid, of course, for the existence of one would be contrary to the laws of nature. In an imperfect fluid, such as air, where the molecules are intermingled, a body, regardless of its size or shape, will always experience a resistance—a resistance which, unfortunately, increases tremendously with the speed.

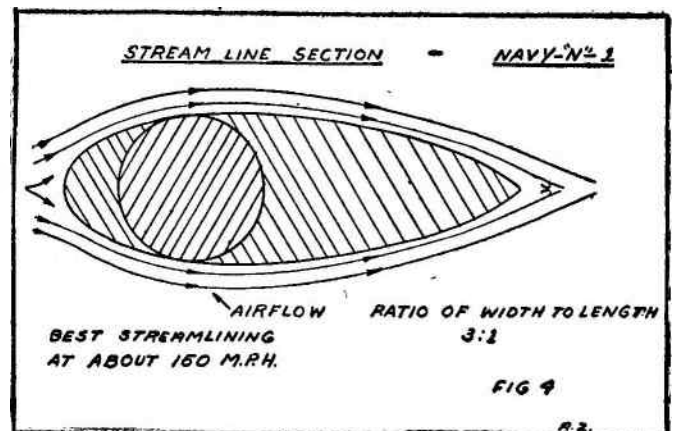
Due to the invisibility of air, it was next to impossible for early aeronautical engineers to determine the actual flow of air around bodies. But with the establishment of the National Advisory Committee for Aeronautics (N.A.C.A.) by the United States Government, wind tunnels of various types have been developed with which to study the flow of air around bodies and determine the ideal shape—the shape offering the least resistance. It was discovered, as most of us are aware, that a flat plate held facing an airstream offers the greatest amount of resistance. On the other hand, a sphere of the same cross-sectional area will offer less resistance, while the familiar streamline shape will offer the least. Why these different shapes vary in the amount of resistance they offer is essentially due to the characteristic nature of an imperfect fluid, such as air is.

Just why the conventional streamline shape shown in Figure 4 offers the least resistance may be understood by reference to Figure 3. (NOTE: Figures in our Aerodynamics Simplified articles are numbered consecutively.



Figures 1 and 2 appeared in the August FLYING ACES.) In Figure 3, we have air flowing over a spherical body. The sphere, as it passes through the atmosphere, displaces a certain amount of air which passes around it. The momentum carries this air past the sphere until it again comes together behind the body. Immediately behind the body, therefore, a region of low pressure re-

sults. Since this region is of lower pressure than the surrounding air, there is always present a tendency for the higher pressure air to rush into the low pressure region. This action causes whirls of air called "eddies" to be formed in the low pressure area, and the resulting turbulence tends to hold back the moving body. Now, as the speed of the body increases, so does the momentum



of the passing air, hence a still greater region of low pressure is formed thus increasing the drag. Another factor which adds to the resistance is the dynamic pressure—that pressure caused by the air directly striking the front of the body.

Once the flow of air around a body became known and the cause of drag was detected, there was only the matter of shaping the body with a contour that followed the air flow. This was accomplished, as shown in Figure 4, by filling in the region of low pressure and gracefully shaping the front, such that it cuts through the air with the least possible dynamic pressure. But it must be remembered that a streamline section, such as is shown in Figure 4, will offer the least amount of resistance at one speed only; for at a higher speed the momentum of the passing air will tend to overshoot the rear portion, thus causing an increase in drag.

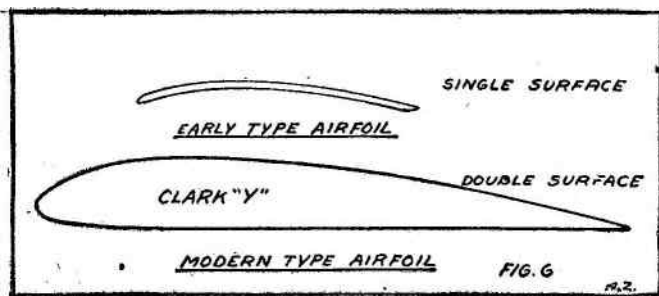
The value of streamlining is of great importance to the aircraft designer and is likewise of importance to model builders—especially those building gas jobs. A gasoline driven model will travel at a speed of about 30 miles per hour, and at such a speed the air has quite a pressure. By streamlining each part, which protrudes into the air stream, the air will flow around the ship with greater ease, thereby reducing the drag and consequently increasing the efficiency of the model. Such streamlining is valuable on any type of model airplane, whether it be powered by rubber bands, by a gasoline motor, or if it is simply a glider.

For an airplane to be moving forward there must be present a thrust force with which to overcome the drag.

As was illustrated in our study of mechanics, if the airplane is traveling at a constant speed, then the thrust is equal to the drag, and we have a case of balanced forces. On the other hand, if the airplane is gaining in speed, then the thrust becomes greater than the drag and a condition of unbalanced forces exists. Such conditions are also present in the automobile, but unlike the automobile the airplane must also rise, which necessitates another force which must be capable of lifting the weight of the airplane. When an airplane is flying horizontally at a constant speed and at a constant altitude we can say that all of the forces are in balance and the airplane is in a state of equilibrium. (See Figure 5).

Most of us are aware from our model building, that the forward thrust of an airplane is gained through action of the propeller in cutting its way through the atmosphere. The lift is obtained by the action of the air on the wing, and, strange as it may seem, this action—the prevailing factor of obtaining lift—is even now little understood.

The first means developed for obtaining lift was the flat airfoil section. This section, however, was found

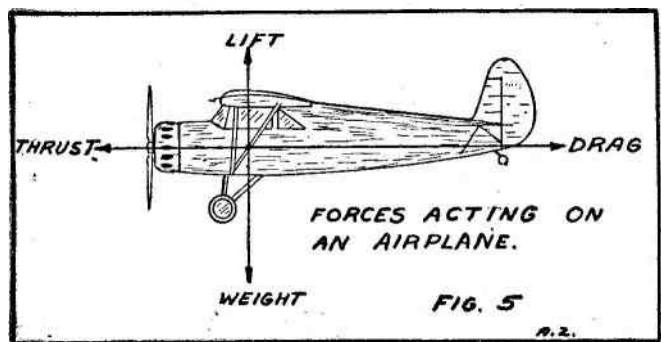


to be very inefficient at large angles of attack, with the result that it had to be discarded in favor of the curved surface, single cambered airfoil which was found to be of higher efficiency. This type of airfoil section resembles the type used on indoor stick models.

Engineers next discovered that at high speeds a single surface airfoil becomes very inefficient, due to the fact that the air flowing past the under side of the single-cambered wing created a turbulent region which greatly decreased the efficiency. It was obvious that if higher speeds were to be obtained this drag must be eliminated. After experimenting with various types of airfoil sections, it was learned that by filling out the under surface of the single-cambered section, the drag at high speeds was greatly reduced and the efficiency was increased. In Figure 6 is shown a typical present day airfoil section. This section, the Clark "Y," is one of the best known to designers. Note the early type airfoil shown above it.

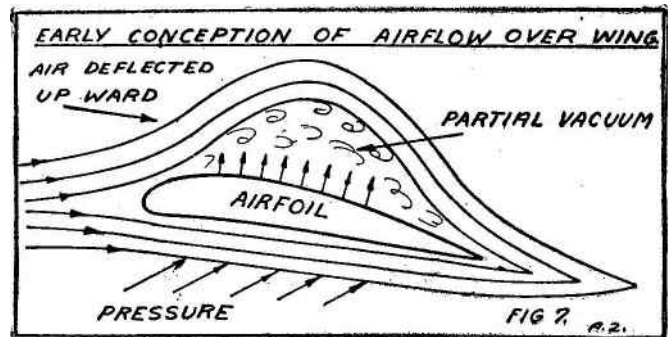
The method by which an airfoil gains its lift has been a topic of discussion since the first day planes took to the air. It has been theorized in many different ways, but it still remains an open topic of discussion and argument both among engineers and students.

The first attempt to explain the lifting effect of an airfoil was the "partial-vacuum-above-the-wing" theory. This theory asserted that as the air struck the leading edge of the wing it was deflected upward and around,



creating, as shown in the Figure 7, a region of low pressure, or as the theory states, a partial vacuum. Since the lower side of the wing was being subjected to pressure from beneath, an increase in pressure was built up which forced the wing to rise upward into the lower pressure region. As was noted by the early engineers, a thick wing section will develop greater lift than a thin section. To account for this phenomenon, it was reasoned that a thicker section would obviously deflect a greater amount of air and hence a larger partial vacuum region would be created above the wing.

As long as there was nobody to question the theory, it remained stable. In fact, almost everybody was satisfied. But the downfall of this theory came not long after its introduction. With the development of the wind tunnels, experiments on the flow over an airfoil showed discrepancies which the theory was unable to account for. The old theory, for instance, was unable to account for the fact that when smoke was allowed to pass over an airfoil it followed the contour of the section, and did not deflect upward as the theory asserted. It was also pointed out that if there did exist a partial vacuum above the wing, then there would be no sudden occurrence of a burbling point (or turbulence) at the critical angle of attack. It is known that it does occur suddenly.



As more knowledge was gained through experimentation, more discrepancies arose which further disproved the theory until finally it was completely discarded.

Next month, we will continue our discussion with the explanation of two more theories: The Induced Lift theory, developed by Prandtl, of Germany, and the Vortex theory, devised by Lanchester, of England. In the meantime, you might get out your models and study them in the light of the explanations of air flow given herein.

## Model Builder's Workbench

(Continued from page 47)

acetone or lacquer thinner. You can use this as an adhesive for your tissue paper, or you can use banana oil for the adhesive and the lacquer for finishing.

To give your model a good, glossy

finish, follow these steps. Spray your paper with water, to shrink it. When it is dry, apply two or more coats of the lacquer, then apply one or two coats of colored dope. Put on a clear coat last. This will give you a lasting as well as a glossy finish which will not get dull or tarnish when exposed to the sun. This process adds very little weight, and thus is especially good for flying scale models.

To finish exposed balsa parts, such as cowlings, struts, etc., on solid models, use the following method. Sand smooth with fine sandpaper and apply a coat of library paste, cross-grained. Let dry and sand smooth again. Cover the parts with two or three coats of lacquer, then color. The paste is a filler for the tiny holes, and saves you a lot of sanding and rubbing.

GLEN COURTWRIGHT.

# Flying Aces Club News

Douglas Allen has taken you "around the world," and we've had a "convention" at Atlantic City. Now let's join "Doug" at GHQ on the short wave bands!

"C.Q., C.Q., C.Q., C.Q.—GHQ, of the F.A.C., calling and standing by! Some one come in, please." This said, National Adjutant Douglas Allen cuts the transmitter and connects the aerial with our short wave receiver.

We slowly turn our dials and almost instantly pick up the powerful voice of W8FTB, Rochester, N.Y.—one of the latest additions to the F.A.C. Radio Communications Corps. Since this is our first contact with Henry L. Carter, Jr., we ask him a little about his station. We are informed that "Hank" talks with "Hams" all over the United States; that he holds an official Army appointment and handles official messages for the Army; that he holds a license that entitles him to operate an Airport Station, and that he eventually hopes to get an appointment to West Point. We tell him that he's set a most enviable record and "Hank" signs off to listen in to the rest of the program from GHQ.

"Doug" then turns from the controls and remarks: "Let's see if we can't pick up the Dawn Patrol, at Boston—the outfit that just the other day joined the F.A.C., bringing 27 stations into the R.C.C.! Accordingly, a call is flashed out for DP1HQ. We get a response quickly, the reason being that this call should only be used in an emergency and that we should have called any one of the other 26 stations—DP1A to DP1Z, inclusive. Captain Lionel K. Berig tells us that he will be only too glad to cooperate with the F.A.C. in any way possible, and proceeds to advise that life saving and first aid equipment and facilities are always ready for immediate use on call and that the patrol owns and operates two cruisers which operate from City Point, Boston, Mass.

After sending out a long "C.Q." call and getting no response, we decide to "broadcast" the following F.A.C. news from Headquarters, hoping that one of these days many of the members involved will have station calls that we can pass on to you that you might directly contact them. Here goes:

Not to be outdone by Bob Thompson of Toledo, Ohio, another "Bob"—Bob Martin, of Milford, Utah—is knocking 'em dead with fine window displays. As



Here's "Hank" Carter in action at his station, W8FTB, Rochester, N. Y.—and you don't have to look twice to see he's got a businesslike layout. Hate to bother you, Hank, while your taking down that message, but look this way a moment—the F.A.C.'s want to meet you.

a matter of fact Bob is putting in such fine displays that a local paper recently gave him a write-up. While the photo he sent us was too dim for reproduction, Bob has done such fine work that he has been awarded a Bronze Prop to wear on his D.S.M. We have more Bronze Props, as well as D.S.M.'s, F.A.C.'s!

Now get close to your loudspeakers, buzzards—here's some interesting news from Hanford, California! It's from one of our most active members, Willetta Crawford. Willetta wanted to know how one of our honorary members—Colonel Roscoe Turner, speed demon of the Airways—felt about the F.A.C. and kindred organizations, so she up and wrote him. Here's his reply:

*"In my opinion the Flying Aces Club, Junior Birdmen, and similar organizations, do a lot for aviation. They stimulate the interest of the youth of America, and they will probably be responsible in the future for a lot of growth and advancement in the industry."*

Bob Hartwell, of Princeton, W. Va., (gosh, but we have a lot of "Bob's" in the F.A.C.!) recently wanted to increase his unit, so he inserted the following ad in a local paper:

ATTENTION, BOYS: All of you who are interested in aviation

(Continued on page 87)

## Happy Landings

(Continued from page 29)

worse hole than she was in 1914, when the only excuse they had was to exclaim: "Yes, but the Germans have been getting ready for this for the last forty years."

Forty years! The next war, considering everything, might last almost forty days, if the babies who get into the air have anything to do with it.

But perhaps we are barking up the wrong alley. Perhaps it will not be Germany invading or attacking Britain. The way things juggle in Europe, you can't tell who might fight. It's no secret that there's been considerable bad feeling between nations who, in the last war, were allies.

## Aces Aflame

(Continued from page 19)

climbed from his ship, Orth met him with a white face.

"Where's Critz?" asked the C.O.

One-Shot gulped, and a look of terror came into his eyes.

"He—he went down—a flamer!" he breathed, a note of hysteria in his voice. "Something went wrong. He called for Signal 12, and dived on a Jerry two-seater. Then, when the others came out of the clouds, I let them have it, but there were some more hanging back, and they came down on me like a ton of lead. Then I saw Critz going down in smoke and I—I guess it kind of took the starch out of me."

Runt Petty was furious when, thirty minutes later, he heard the story from the lips of his C.O.

"Critz knows I never used the same signal twice in succession," he said. "I told him there was too much danger that the Krauts would get wise. And I told him that I had used Number 12 last."

"He probably got confused," said the captain. "After all, it was his first experience working with Orth, and Orth said he carried out his assignment perfectly."

"Yeah, but he picked the wrong maneuver. You say he went down behind the enemy lines?"

Captain Crowell nodded, and Petty heaved a sigh of obvious relief. Perhaps Critz was all right, but just the same he felt that Orth would be a lot safer with some one else.

"Hasn't Orth been in to see you yet?" asked Crowell.

Runt frowned. "No. He's probably too worked up over seeing Critz go down. If he doesn't come over before night, I'll drop in on him. I hope he hasn't lost his nerve."

WHEN Orth had not shown up by evening, Petty slipped on his blouse and made his way across the drome. He decided to drop into the C.O.'s office calling on his friend. He found Captain Crowell sitting behind his desk,

## WINGING EVER ONWARD!

Every F.A.C. regards the loss of our honorary member, Wiley Post, as a personal loss; and while Will Rogers did not happen to be an honorary member, for him the same feeling exists. But though they are gone from this world, their works live on. Wiley Post's propeller will ever churn the air in the memory of those who ride the skyways, and Will Rogers, the great humanitarian, will never be forgotten.

moodily chewing a cigar.

"What's up?" asked Petty. "You look worried."

"Petty, there's hell to pay," Crowell exploded. "Critz just got back. He was captured, but he escaped and made his way back through the lines. He says the Krauts have invented a new incendiary bullet that will set fire to nearly anything it touches. Says he saw it tested out himself, and it's sure fire."

"Good Lord!" ejaculated Runt. "Don't let him get to One-Shot with a story like that."

"I'm afraid it's too late," said Crowell gloomily. "He told Nelson and Mulhall before he saw me. It'll be all over the place by now. Petty, do you realize what it will mean to us if what he says is true?"

"I realize what it will mean to Orth," said Petty grimly.

"Right. And as Orth goes, so goes the 174th. The other pilots may pretend not to like him, but every victory he brings in spurs them on just that much more. Petty, you've got to talk to him—talk like a Dutch uncle. If he doesn't snap out of it, our morale's going to be all shot."

Petty hurried out and made a bee line straight for the hutment of his friend. He found Orth sitting at a table, staring at a half-emptied bottle of cognac.

"H'lo, Runt," greeted Orth, without raising his eyes from the bottle. "Squattez vous and drinkez avec moi."

"I heard the yarn Critz has been spinning," said Petty, without preliminaries. "It sounds like a lotta tripe to me. The whole thing smells fishy. But it goes to prove one thing I've always contended, and that is that you can bring a ship down in flames and get away with a whole hide."

Orth shuddered and turned several degrees paler. He took a long swig from the bottle, made a wry face, then smiled pathetically.

"It's no use, Runt," he said. "The thing's got my goat, and you can't buck me up. I guess I'm just yellow."

Fire flashed from Petty's eyes. "Like hell you are! If that little dried-up herring can bring a flamer down without getting his eyebrows singed, I know you can."

One-Shot shook his head despairingly. "It isn't that. I just can't face the fire. I'd—I'd go clean off my nut."

Petty gazed at him a moment in silence. Then he arose, snatched the cognac bottle from his friend's hands, took it to the door, and emptied it into the night. Then he loosened his collar, picked up a six months' old magazine, sat down, and propped his feet up on the table.

"What are you going to do?" asked Orth dully.

Petty riffled the pages of the magazine. "I'm going to stay right here with you until you get some sense in that added head of yours."

"But the M.O. said—"

"To hell with the M.O.!" said Runt. "I'm staying."

AT three-thirty the next morning, an orderly poked his head in the door. "Your show this morning, sir," he said, then threw a surprised glance at the grim figure sitting in the chair. The snoring form on the bunk did not stir.

"I'll get him up," replied Petty. "Beat it."

"Yes, sir." The orderly hastily withdrew.

Ten minutes later, Captain Crowell entered. He grinned at sight of Petty.

"Doc's got the wind up because you went A.W.O.L. last night he said. I told him I hadn't seen you, so for heaven's sake, back me up when you see him. Told him you'd probably gone off on a binge, and that I'd scalp him if anything happened to you. Had an idea you were here."

He turned to Orth, who was silently dressing. "Feel like going on dawn show this morning?" he asked. "If you don't, I can send Harper. He—"

"He'll go," interposed Petty.

Crowell threw him a peculiar look. "Right," he said. "By the way, you'll get a surprise when you see your crates, Orth. I've had a crew of greaseballs busy all night painting them—all colors of the rainbow, and some no rainbow would ever dream of. Critz's idea. Camouflage, you know. That boy Critz has brains, all right. He may not be a good combat man, but after all, we can't all be like Orth, here. I think you've got him pegged wrong. He was all broken up about his failure yesterday. He insisted on overseeing the painting last night, although he was pretty much all in after his experiences. Not a bad sort at all, when you get to know him."

"Humph!" grunted Petty. Orth made no comment.

It was exactly two hours later when Runt heard the drone of a single approaching plane and dashed out onto the tarmac. Captain Crowell was already there, anxiously gazing into the east.

"Who is it?" asked Petty breathlessly.

"I hope it isn't who I'm afraid it is," responded the captain.

But it was. A few moments later, a Spad, its wings and fuselage a kaleidoscopic riot of color, swooped out of the sky and made a miserable landing. A white-faced figure staggered out of the cockpit.

"Orth!" barked the C.O. "What's happened? Where are the others?"

One-Shot looked at him dazedly for a moment, then shook his head as though to clear his brain.

"Critz was right!" he muttered. "Critz was right!"

Crowell took him by the shoulders and shook him. "What do you mean? Answer me!"

"That German invention!" cried Orth hysterically. "We got into a dogfight on our way back. The others went down—all flamers!" A spasm of fear shook him, and his eyes stared wildly.

"And you?" asked the captain grimly. "You ran away?"

Orth's big frame was suddenly

wracked with sobs. "I—I couldn't help it," he choked. "I didn't know what I was doing."

Stunned by the horror of the disaster that had overtaken the dawn patrol, Crowell said nothing for a moment. Then he spoke. "Go to your quarters, Orth. Consider yourself under arrest."

THE little knot of men which had gathered around them contemptuously opened a lane to let Orth pass through. Petty, who had held his tongue, noticed that Critz was among them. There was a half-sneer on the latter's face, and a look of combined hatred and triumph in his eyes.

Runt followed the C.O. back to his office with a thoughtful look on his face. Then, for some fifteen minutes he talked earnestly and eloquently. At the end of that time, the captain leaned back in his chair and regarded him steadily.

"All right, Petty," he said at length. "It's worth a trial, anyway. Go to it—and we'll hope for the best."

A few minutes later, Runt Petty entered his friend's shack with a package under one arm. He put the package under the table, then stood looking at the broken figure lying face downward on the bunk. There was a tender look in his eyes. The tender look faded, the cheeks knotted in hard lumps, and his eyes became flinty. He picked up an old newspaper and advanced to the bunk.

"Sit up, Orth," he said. "I want to talk to you."

The man on the bunk stirred, then slowly sat up.

"Orth," said Petty, "this is something you can overcome. You've got the guts to do it, and I'm asking you to—for my sake, not for yours. The boys look upon us as brothers. What they think of you, they think of me, and I don't want to be thought of as a coward. Here—take this paper."

Stupidly, wonderingly his friend took the paper. Petty reached in his pocket for a match. He scratched it on the sole of his shoe, then slowly but inexorably he brought it up until it was almost at the under edge of the paper.

"I'm going to set fire to that paper," he said, "and I want you to hold it in your hands until it scorches your fingers."

Orth gazed in stark terror as the flame came in contact with the paper, licked up hungrily. The blaze flared, leaving a slowly widening charred circle in its wake. Orth's hands shook, and his eyes widened in fright.

Then, with a scream, he flung the paper from him and leaped from the bunk.

"Damn you, Petty!" he yelled, and his fist shot out at the other's jaw.

His friend crashed over backward. With a sob, Orth leaped for the door, jerked it open, and was gone.

THE early afternoon found Runt Petty wandering aimlessly about the drome.

Although the sun shone brightly, a chill wind from the north blew across the tarmac, and Petty sought the lee-

ward side of No. 1 hangar, dropped heavily to the ground, and abstractedly began to pluck grass blades.

He hauled a half-consumed plug of chewing tobacco from his pocket, started to take a bite, thought better of it, and replaced the plug in his pocket. A short smoke would taste better right now, he decided. He found a cigarette, lit it, and tossed the match carelessly onto the green grass.

To his surprise, the grass leaped suddenly into flame. Petty jumped to his feet, stamped on the blaze, and with difficulty finally managed to get it out. Then he noticed that the burned area covered a spot of paint which had evidently been spilled the night before.

He found another spot of paint on the green grass, lit a match, and tossed it on the spot. It immediately burst into flame. He stomped it out.

For a moment, Runt Petty stood thoughtfully regarding the earth. Then he turned and walked briskly into the hangar. He approached one of the mechanics, who was industriously cleaning a carburetor.

"Are you one of the men who was on that painting detail last night?" asked Petty.

"Why, yes, sir, I was," replied the greaseball.

"Do you happen to know who painted Lieutenant Critz's ship?"

"He painted it himself, sir. I noticed that he seemed very particular about it."

"H-m. Naturally. And who had charge of mixing the paint?"

"He did, sir. He was quite particular about that, too."

"Thanks. I guess that's all."

The mechanic followed him curiously with his eyes as he strolled along the row of planes. Orth's and Critz's ships were side by side. They looked identical, except that his friend's ship had a small "3" on the fuselage, while the other carried the numeral "8."

Petty had a sudden yearning to get into Critz's hutment and give it a thorough search. But Critz would be asleep now, and he would not have an opportunity before night. He strolled back to the mechanic and at the end of some earnest conversation, he extracted a couple of twenty franc notes from his wallet and toyed with them. The mechanic threw a furtive glance about the hangar, nodded his head, and the notes changed hands.

Mid-afternoon saw a slight stir caused on the tarmac by the arrival of a Bristol fighter. Its pilot, Captain Martindale, of the R.F.C., was a close friend of Crowell's, and dropped in occasionally for a visit.

Petty had seen the ship before, but this time he regarded it with renewed interest. A plan began to formulate in his brain. He strode to the C.O.'s office, knocked, and was told to enter.

Twenty minutes later, Runt Petty, a hard smile on his face, stood again in the portal.

"Remember," came the voice of Crowell from behind him, "it's your last chance. If it doesn't work, back to the pool he goes. And you be careful

of that crate of Martindale's."

"Yes, sir," Petty saluted and closed the door gently behind him.

He went to the hangar again, got the mechanic with whom he had previously conversed, and for the next half-hour the two of them were busy working over the Bristol. Then he went to the hospital, had a talk with the medical officer, and a short time later, reappeared with Orth at his side. There was a look of dazed despair on Orth's face.

"I don't see how in the world you can trust yourself to go up with me," he exclaimed.

"I'd trust myself in hell with you, One-Shot, and you know it," Petty replied. "You're all right. You'll snap out of it. Now get in and put this old crate through her paces. It'll be a tonic—I hope," he added to himself.

Orth climbed in, adjusted his head phones, and began testing the controls. Petty waved a hand to the captain and his visitor, who were standing in the doorway of the office, and clambered into the rear cockpit. The mechanic spun the prop, removed the blocks, and they were off.

AT five thousand feet, they leveled off, and Orth began to put her through a few maneuvers. Petty nodded his head. That was a good sign. The ship answered the controls like a thoroughbred, and Orth was beginning to show signs of interest.

"She's a pip, isn't she?" asked Petty over the phone, when they had straightened out of a breath-taking barrel roll.

"A honey," assented Orth, with enthusiasm. "This old Rolls certainly has power to burn."

Petty smiled grimly. To burn! Yes, she had power to burn—but did his friend? Well, it was now or never.

"What would you do, One-Shot," asked Petty suddenly, "if the old bus caught fire? Would you bail out and leave me to crash?"

"My God!" came Orth's frightened voice. "What are you trying to do—scare me to death?"

Petty reached down in the cockpit and threw a small make-shift switch. "No," replied Runt, "I'm just trying to bring you to your senses. I'll answer my own question by saying I know you wouldn't. You'd take this crate down even if the flames seared your eyeballs out, and set it down on the field right side up. You'd do it to save me, wouldn't you?"

"I—I don't know. I think I'd—try."

"I know you would. You've got the guts to. And you're going to, One-Shot, because there's smoke coming from her nose right now. The ship's on fire!"

Even as he spoke, a puff of black smoke belched from the cowl and almost suffocated them. There was a yell from the front office and the plane lurched, went into a terrific nose dive.

"Level off," directed Runt, in a steady voice. "Level off. Then put her in a nose-high slip."

He repeated the instructions. Orth raised up in his seat, looked back wildly. Petty shook his head and pointed calm-

ly at the controls. Again he repeated his command. His friend stared at him for a moment, then slowly sank back in his seat.

The ship came out of her dive. Orth pulled the stick back a little and gave her right rudder, his movements mechanical, as if he were in a trance. Like a wounded pigeon, the ship began to flutter toward the earth. Petty breathed a sigh of relief, then suddenly choked it off with a gasp. A burst of flame had sprung from the nose of the Bristol. It was really on fire!

He kept up a steady, monotonous stream of talk as the ship plunged toward the earth. Orth was fighting desperately to keep its nose up. Nearer and nearer came the ground. Runt could see figures rushing madly to and fro on the field below.

"We'll make it all right," he encouraged. "You're doing as beautiful a piece of flying as I ever saw. Easy, now. Not too close. Straighten her out."

Gradually the Bristol leveled off and settled toward the earth. They pancaked with a gentle bump, just as the flames licked menacingly into the front cockpit. Runt and One-Shot tumbled to the ground almost simultaneously.

Meat basket and crash truck came screaming out. The M.O. lit running, but came to a sudden stop when he saw that the two men were safe.

"Fooled you that time, you old vulture," chortled Runt.

Captain Crowell came running up, followed by his friend.

"Damn you, Petty," he bellowed, "I told you to be careful with that crate. I was afraid that smoke bomb would cause—"

He broke off suddenly as he noticed Petty violently shaking his head and waving his arms. Orth turned unexpectedly and intercepted the signal. Runt's face took on a foolish grin, like a small boy caught in the pantry.

"So that was a put up job, huh?" said One-Shot accusingly. "What a pal you turned out to be!" He turned to one of the other pilots, who held a Paris edition of the *Herald* in his hand. "Let me have your paper a minute, will you, Wilson?"

The other complied wonderingly. Orth unfolded it and held it between outstretched hands.

"All right, Runt," he invited. "Go ahead and light it."

With a gleam of joy in his eye, Petty obeyed. The paper flared in Orth's hand, the flame steadily mounting and spreading until it leaped above his head and almost touched his fingers. His hands trembled, but they clung to the paper tightly.

"Drop it, you fool!" yelled Petty. "You'll burn your fingers."

But Orth held on to the flaming paper grimly. Petty snatched it from his hands, beat out the burning fragments which he still held. Then he turned to the C.O.

"Bring on your Krauts and all their cute incendiary bullets," he shouted. "One-Shot's gonna—gonna—"

He gulped, turned pale, and staggered. Orth sprang to steady him.



"What's the matter?" asked the M.O. hopefully. "Are you hurt, after all?"

Petty took a deep breath, then squinted menacingly out of one eye. "Hurt, hell!" he snarled weakly. "I swallowed my chew!"

THE pilots were just beginning to file into the mess hall when *alerte* sounded. No one noticed a small figure with one arm in a sling emerge from the hutment of Lieutenant Critz. Ships were being wheeled out on the line, and the sputter and cough of cold motors broke on the air.

Runt Petty joined the group of pilots that had clustered about the C.O. He battled his way through until he stood by Crowell's side. He saw Critz approaching.

"Don't send anybody up except Orth and Critz," he whispered. "No one else has a chance."

"But there are four of them coming," said the captain. "Why?"

"Can't explain now," muttered Petty. "Tell you later. Please do as I say."

The captain stared at him a second, then nodded. "Orth!" he barked. "You and Critz think that you can handle them?"

"I know we can," flung back One-Shot, who was already running toward the plane identified by the numeral 3.

"Yeah," Critz said, "if Orth doesn't turn yellow again."

He climbed into the cockpit of No. 8. Petty was hanging onto the side of his friend's ship, shouting something into Orth's ear.

"Here they come," yelled Crowell, pointing aloft. "Get going."

Orth's motor roared, and the plane lurched forward. Petty jumped, just in time to see Critz's ship bearing down on him. He hit the earth, rolled, and heard the wheels swish by not two inches from his head.

"The lousy bum!" he yelped, picking himself up gingerly. "He did that on purpose."

Crowell came running up, but Petty shook his head with a sour grin. "I'm okay," he said.

But the captain had already transferred his gaze to the two ships spiraling upward. Out of the east came four Fokkers, in step formation, one above the other. They piqued downward toward the Spads. Critz had drawn abreast of Orth, and they were climbing together.

Suddenly Critz's left wings dipped twice, his right once.

"Signal 21," shouted Petty excitedly.

"That's it, all right. Critz breaks to the left, drops, faking conked engine. Orth breaks to the right, Immelmans—there they go!"

But the four black-crossed ships did not follow the seemingly crippled plane. With a quick renversement they swept around on Orth, Spandaus flaming.

Up above in Spad No. 3, One-Shot Orth grinned crookedly as he saw Critz falling away from him. The maneuver was supposed to give him altitude for a quick dive on the enemy's tail. But he held to his Immelmann only briefly.

Suddenly he swooped over in a rolling loop, leaving the Fokkers wasting tracers on the empty air. Before they realized his strategy, he was coming up underneath them.

FOR the space of two eye-blinks, a black-crossed fuselage was in his ring sights. His fingers tightened on the trips, and four short bursts hammered from his Vickers. The fuselage above him quivered, then passed from view.

Pounding doggedly upward until his motor was almost at the stalling point, he caught the inverted cockpit of a looping Fokker in his sights. Frightened eyes stared down directly into his own. His Vickers bucked again, and the frightened eyes suddenly glazed.

Screaming lead wrote a dotted line across Orth's wings. He kicked the Spad into a shimmying sideslip. It would be just too bad for him if he let the Jerry sign on that dotted line.

Then he saw them—one above him and one below. The one below was working frantically with his Spandaus. Jammed guns! What a break! He zoomed just as the Jerry above him dived. Head on they hurtled, two pairs of red eyes flaming lead.

The Fokker gave way first, curved upward, and One-Shot wrote a message of death on the flying belly.

"There's your old signature," he shouted.

The words had hardly left his lips when a wooden splinter buried itself in his cheek. A swarm of metal insects zipped past his head. He turned in his seat, stared back.

Behind him was a Spad, Vickers spewing crimson flame. Critz! He jammed right rudder and swung his stick over. Down he went in a sideslip that almost developed into a vrille, but suddenly became a power dive, ending in a snaky chandelle upward.

But Critz still clung. Orth's tail assembly began to look as though it had been through a food chopper. He tried everything in the book to shake his pur-

suer, but it was no use. If Critz could shoot as well as he flew Orth would have been dead long ago.

With an effort, he pulled into a loop. Then, wires screaming protestingly, his Spad dived, and he caught a fleeting glimpse of Critz's cockpit in his ring sights. Yet he held his fire. He didn't want to kill Critz—he wanted to ride him down.

But as the other's tail flashed past and Critz again bore down upon his tail, One-Shot realized that he had to cut loose. With a jerk, he roared his Spad into an Immelmann and flung himself upon Critz, blasting lead as he came.

To his surprise, flame leaped from Critz's plane at his first burst. He saw the man cringe in sudden terror, his face blanched. With the rapidity of a forest fire through dry timber, the flames rushed along the fuselage toward the cockpit. One-Shot, following him down, saw Critz raise up in his seat and, with a wild cry, hurl himself into space.

Ten minutes later, in the C.O. office, Runt Petty, a quid in his cheek the size of an apple, was explaining.

"I simply got one of the greaseballs to turn Orth's 3 into an 8, and *vice versa* with Critz's ship. That left One-Shot with the only crate that wasn't painted with that inflammable paint.

"I went in Critz's shack the minute he went to mess, and found these four waterproof pouches, one of which still has some of the powder in it. He simply mixed the powder with the paint, and the chemical reaction produced a highly combustible mixture. That incendiary bullet scare was a lotta bunk, but if they could have made us believe it long enough, it would certainly have ruined a lot of morale.

"You did a good job, Petty," complimented the captain, "but what I'm worried about now is who's going to team up with Orth."

"I am," replied Runt promptly.

"With a busted arm?"

Petty grinned. "Busted, hell! It never was busted. I cooked that up with the M.O. so I could get a line on Critz. I've suspected him of being a Jerry spy for a long time. Say, what the—"

He looked down suddenly. The sling in which his arm was buried was on fire! With a yell he pulled the arm out, jerked the sling off, and flung it from him.

"What's the idea?" he demanded injuredly.

"That's the fire test," said Orth gravely. "Runt, I'm ashamed of you!"

## Secret of the Hell Hawks

(Continued from page 5)

mild-eyed, corpulent little Mosquito, who was still cursing the earliness of the hour, for he loved his sleep. And on Kirby's left, completing the V, flew the eldest and wisest of the trio—long-faced and taciturn Travis, whose lean frame jutted high from his cockpit.

Kirby was leading his two comrades in a race against time into the French

back areas. They had broken all records since, in darkness, they had taken off from their drome—the 44th U.S. Pursuit Squadron.

Kirby fished from his teddy-bear the letter that had sent him and his comrades on this strangest of errands. By the light of the hooded instruments he read again the scrawled words he

knew by heart—words written in English, but obviously by the hand of a Frenchman.

To the Three Mosquitoes:

*I turn to you three gallants as I stand in the shadow of death. For my crime I must die. But before I die there is information I dare convey only to you*

three, in whose hands alone it may serve to expiate the damage my honesty, rather than my treachery, has caused.

If this reaches you in time, and if you are moved by a doomed man's last prayer, speed to Vincennes and enable me to speak with you before they execute me at dawn.

Emil Rodet.

Frowning, Kirby shoved the message away. In the small hours of the night it had been delivered by a furtive, bribed prison warder who had awakened the Mosquitoes by tapping on their barracks' window, and quickly slinked away after leaving the message.

And though the Three Mosquitoes had hastily dressed, they had been dubious. They had heard vaguely of the Rodet case, of the Frenchman who had committed the enormous crime of launching a whole, suicidal drive merely in the hope of regaining his German-held Somme property. It was a clear enough case, and hardly one which could rouse their sympathies.

Kirby had asked his two comrades, as the three dressed in their oil-illuminated cubicle: "What do you make of this Frog's request?"

Little Shorty Carn already had his inevitable briar pipe going. "I think," he yawned between puffs, "that we ought to go back to sleep and forget about it. Probably if we did go to Vincennes, the poor Frog would only give us a locket to take to his sister or some dying words for his brother. What do you say, Trav?"

Both had turned to the lanky, elder Mosquito, on whose shrewd judgment they had come to rely. Travis had taken the letter, was studying it.

"There's something strange about this message," he said at length in his familiar drawl. "The man who wrote it was obviously desperate—look at the scrawly writing. And the wording, too, is puzzling—that stuff about the damage being caused by his honesty. Look here—" he jerked up decisive eyes, "suppose we phone Intelligence and ask their advice. Better move fast." Kirby had made the call from the C.O.'s shack, and in minutes was tensely listening to the barking voice of General Saunders, Yank chief at G-2.

"So Rodet wants to see you three—and nobody else! Maybe you'd better look into it. There's been something fishy about this Rodet case from the start. The French learned that after the treachery in the Somme, Rodet was trying to communicate with a Boche named von Bergsten. And last night we got an even stranger tip from one of our agents. A tip that Udermann himself has been sent across to our lines, ostensibly to contact Rodet before his death and—"

"Udermann!" Kirby had broken in, his eyes narrowing to slits as he held the phone to his ears. For Udermann was a sore spot with the Three Mosquitoes, the one Boche whose cunning and diabolical machinations had offered them grim competition. Erich Udermann, chief of the flying branch of the

dread *Nachrichtenamt*, the mighty Boche Intelligence System. Udermann—a spy of spies, a master of disguise, a crack shot with pistol or Spandau, and on top of that an ace of aces!

"General, it's nearly dawn!" Kirby, stirred to action, had gritted into the phone. "Can you hold up that execution so—"

"Impossible! Before we could wade through the red tape necessary, Rodet will be buried. The French are furious about that Somme business because it put them in a bad light with the British. They intend to make an example of Rodet. No, you'll have to fly there in person, beat the firing squad! And you'd better get started at once!"

The mere mention of Udermann to Shorty and Travis had stirred all Three Mosquitoes to hasty action, caused them to rouse their mechanics and have their mosquito-marked ships hastily wheeled out.

## CHAPTER II

### TERROR SHIPS STRIKE

NOW they were winging in their V formation on the last lap of the flight to Vincennes, trying to beat dawn and that firing squad. Hell-bent, wings rocking, the three Spads were now just starting to pass over the outskirts of the dark village of Luennes.

It was Shorty Carn who waved excitedly from his cockpit. At first Kirby, seeing the little man's gesticulations, didn't understand them at all. But then, as he saw that Shorty was pointing down toward the earth, while mingled amazement and horror showed on his round, goggled face, Kirby quickly peered over the cowl.

A gasp ripped the breath from the Mosquito-leader's lips. For what had, just a moment ago, been a dark, sleepy-looking little village had turned suddenly into a livid eruption of hell!

Geysers of red flame were spouting from Luennes—flame that illumined crumpling buildings, caving-in roofs! Dull concussion reached the planes of the Mosquitoes high above, making them wobble.

Then, over the explosions, over his own pounding Hiss and the two other Hissos beside him, Kirby heard a whining sound, an inhuman, ghastly wail—the sound that perhaps shells of unheard of size might make coursing through the ether.

In the next instant a cry of incredulous horror came from Kirby, for now he saw them! Hurling down upon that doomed village were dark, shadowy shapes—glinting, cylindrical shapes with scarcely any wings. Planes—strange planes which traveled with impossible speed, slicing down through the air like projectiles. Obviously they were hurling bombs on Luennes as they dived, which gave the falling explosive "eggs" all the momentum and accuracy of direct-hitting shells!

Kirby was crazily pulling up his Spad, scarcely conscious that the two Spads on either side of him were also pulling up. Those hurtling planes—for the past week the Mosquitoes had been

hearing rumors about them. From all over the Front had come reports of these new mysterious Hell Hawks which were horrifying the Allies—ships that flew with such incredible speed that it seemed they must be propelled by rockets and controlled by distant wireless, for it was unbelievable that men could fly such things and live.

And now, as Kirby peered over his Spad with wide, horrified eyes, he knew that he and his comrades were witnessing an attack of the dreaded new Terror ships. The mysterious, speedy crates were strafing hell out of Luennes. By whatever power controlled them, they were striking with their bombs like lightning, then rocketing up to attack anew. Up and down they went, at dizzy speed, completing the awful holocaust of Luennes.

This time it was the shrewd Travis who gave the frantic signal with a staccato burst of his twin Vickers guns, followed by a series of gestures with his lank arm. The sudden, rising shriek in their ears told Kirby and Shorty far more than Travis—a shriek that filled the sky around them with its ear-splitting pitch.

Madly, Kirby waved his comrades to follow as he jerked back his joy-stick. The three Spads reared frantically, were zooming at full throttle as, slicing up from the murk below, two of the dread mystery ships came rocketing straight towards the trio.

In comparison with their up-coming speed, the Spads were as slow as snails. Kirby could see the tapering fuselages of the two upcoming shapes—craft which showed no protruding knob of a pilot's helmet! With hideous accuracy, the two mystery ships were coming head-on, as if to crash straight into the three Spads.

The onrushing ships seemed to be of metal construction and they had very little airfoil—mere stubby fins seemed to guide their lightning flight.

The Three Yanks who had never yet been stumped by any horror of war gamely tried to leap to the defense now. Unable to elude the mystery ships, they were turning in their fighting formation, and all three were leaning to their sights.

"Try lead on 'em, damn them!" Kirby was grating, even as he pressed his own stick-triggers.

THE VICKERS of the three Spads blazed in furious unison. Three streams of lead greeted the oncoming mystery planes, but though they were well-aimed they missed; for the whizzing, stubby-winged Terror ships veered—and their speed carried them well wide for the Yank shots. As the two strange crates shrieked in from another angle, the Spad jerked and shook with the blasting impact of lead dealt out faster than any known gun could deal it. The meteor-like enemies were shrieking around them then, flying rings around them! Kirby cursed futilely. Down below now, he saw that the other mystery ships had finished with Luennes. Their bombs, hurled down with such terrific speed and ac-

curacy, had left the French town a smoldering mass of ruin in which not a single building remained standing. Now they, too, were soaring upward! They would probably join the attack against the Mosquitoes, and Kirby and his comrades would be blasted to utter hell.

The brilliant flash of light in his eyes blinded and dazed Kirby. Realization came then—all this time he and his comrades had managed to keep their Spads in a climb. Now they had climbed so high that they had reached the upper sky where the dawn was already day, and the sun was blazing. And as he glanced down from his cockpit, a wave of frenzied relief swept Kirby. He saw one of the mystery ships turning downwards, abandoning the fight, disappearing with several others in the mists below. Evidently the strange new ships could not come any higher, for some reason or other.

The shriek which rose again in Kirby's ears seemed to belie the very thought. For one of the mystery ships had not turned down! Alone, it was slicing up out of the haze. Up it came towards the Mosquitoes, who were again in close formation.

*B-r-r-r-r-OOOOM!*

The explosion flattened Kirby's eardrums, shook every bone in his body. At first he thought the impact must have come from collision—either his Spad or one of the others had been smashed by the up-hurling mystery ship.

Dazedly he saw a little blotch of dissipating black smoke and flame in the sky directly below, and at the same time he glimpsed the planes of his comrades, staggering but intact.

He gasped as he saw that the mystery ship which had followed them up here had exploded in mid-air, blown of its own accord to smithereens!

And down below, in the mists, the rest of the Terror ships had vanished as suddenly as they had appeared—vanished after bombing Luennes off the map!

Dazedly, as they resumed formation, Kirby glanced from side to side at his two comrades, saw all his own stunned horror and shock reflected in their goggled faces. Even the stoic Travis looked strangely pale, taut-featured. For all three knew that they had seen and come in contact with the dread Boche menace that had baffled the Allies. They had seen the Terror ships strike with their own eyes.

"It's impossible!" Kirby was wiping the mist from his goggles with the back of his neck-scarf.

He broke off, noting that Travis was waving with grim haste—pointing ahead. And with a shock Kirby remembered then—Vincennes—Emil Rodet—the firing squad! Even now the light of day was beginning to creep across the murky earth below, the mist parting like a curtain. They had been delayed dangerously long. By this time—

The three Spads, though quite riddled with bullets, were fortunately able to maintain their speed. In a mad spurt of roaring flight they sliced over the

ruined town of Luennes, raced on through the air towards the northwest.

THEY broke all records then, although to Kirby their speed seemed sluggish after witnessing those dread projectile-things. The Mosquito leader strained his head forward, watching the lightning earth. And then at last his eyes sharpened. He could see the town of Vincennes: and nearby the squat, rearing pile of stone and steel which was Vincennes prison.

And then Kirby saw something else, something that drove a spur into his frenzied haste. On one of the green fields adjoining Vincennes was a little group of blue-clad figures. Eight of them—*poilus*—were leveling glinting rifles towards a stake in the ground, a stake to which a figure was bound!

No planes ever made a swifter descent, nor a less ceremonious landing, than did the Three Mosquitoes then. They scarcely bothered to get the wind on their noses. One and all, side by side, they went hurling down with cut engines over the grim prison walls, straight for the very field on which the firing squad was assembled. In less time than the telling, their wheels were bouncing on the green, rolling to a three-point stop scarcely a stone's throw away from the group of Frenchmen.

Kirby already had his safety-strap hampered open. From his cockpit he caught a swift but comprehensive glimpse of the grim scene.

The prisoner stood listless against the stake to which he was bound. The eight *poilus* held their rifles unwaveringly aimed. On one side stood the colonel of the *Deuxieme*, a blue-clad *capitaine*, and a priest.

At this very instant the colonel was starting to raise his arm to give the fatal signal.

Kirby leaped to the ground, could feel rather than see Shorty and Travis leaping after him from their own idling crates. He dashed forward, yelling at the top of his lungs in bad but understandable French:

*"Arretez! Arretez! Stop! Stop!"*

And, quickly, to give it an official air, he whipped out the only paper he had on his possession—the Rodet letter—and waved it as if it were a pardon.

He saw the figure at the stake jerk up his head, saw the old Frenchman's eyes upon him and his rushing comrades; saw recognition in them, and wild hope. He yelled again, trying to drown with his powerful lungs the loud roll of drums. Then the fox-like *Deuxieme* colonel whirled half-around, was hesitating, his arm still half-poised.

"Wait!" Kirby bellowed at him, waving the letter. "Wait, in the name of the Republic!"

The Colonel lowered his arm, cursed fluently, and barked an order. The drums ceased. The firing squad lowered its rifles.

But a single shot rang out in the stilled air like a crack of doom. One of the eight rifles had fired instead of lowering. Which one, it was impossible to see in the grey air and in the milling

confusion which followed. For even as the Mosquitoes stopped in their tracks, frozen, several things happened at once.

As the shot echoed and died in the morning air, the old Frenchman at the stake could be seen to jerk spasmodically against the bonds that held him. Slowly, his frail body slumped forward, his head went to his chest. But even as the life poured out of him in a widening crimson stain on his shirt-front, a shrill shout broke from his dying lips, rose with the rattle of death:

*"St. Pierre! St. Pierre—"*

Gaspingly he screamed out the name of St. Peter, whom his soul even now must be facing. The shout stirred the priest, who rushed forward in his trailing robe. At the same instant the firing squad, as if confused by the miscarriage of orders, were milling about in a disorderly mass. The Mosquitoes stood, staring at the stake, where the Frenchman's motionless figure looked like a scarecrow now. The colonel of the *Deuxieme*, his face livid, his outer calm gone, was bawling at the *capitaine*, who in turn was bawling at the squad.

IT was minutes before order came out of the ghastly chaos. At the combined orders of the colonel and *capitaine*, the squad finally reformed in a line, was standing at attention—holding rifles. The *capitaine* continued to bawl at them. The colonel rushed to the stake and was untying the Frenchman, whose pitiful body promptly sprawled to the ground in an inert heap.

"Dead—through the heart," the colonel clipped. He jerked up, for he found the Three Mosquitoes confronting him, standing with goggles pushed up and faces grim.

"But it is no wonder." Although he did not know them, the Colonel was already making excuses. "This is a late time to bring a stay of execution! When I gave the order, one of the soldiers must have construed it as the order to fire, though that will not serve as his excuse when we learn who he is." He glanced at Kirby's hand, which still held Rodet's letter. "Now, let us examine the writ."

Kirby spoke slowly. "It is no writ, *monsieur le colonel*. It is merely a personal letter I used as a trick to stop you." And as the colonel seemed to stiffen into a ramrod of indignation, he went on: "We are the Three Mosquitoes, and we came at the behest of G-2 to interview Emil Rodet—before he died." He glanced bitterly at the inert heap at the foot of the stake. "We had to try to delay you, because we ourselves were held up at Luennes by—"

"Luennes?" The colonel's anger seemed swept away by a far greater agitation. "Then you must—" He stared at them incredulously. "You must have seen the Hell Hawks and yet—"

"*Oui, oui*, and yet we are alive!" It was Shorty Carn who chimed in.

The lanky Travis, his long face grim, held up an arm. "We're wasting time. The Terror ships are still a mystery, and we can discuss them later. The matter in hand," there was a strangely

cold note in his drawl, "is to learn who fired the shot which killed Emil Rodet. Perhaps the *capitaine* over there has located the man."

The others followed his narrowed glance towards the firing squad, where the *capitaine* was bawling questions. One and all, the eight blue-clad *poilus* were denying with Gallic vehemence that they had fired the shot, each man accusing his neighbor.

"Let's look at those rifles right now!" the Mosquito leader gritted, his own hand reaching for the butt of his side-lastered Colt.

The two French officers and the Three Mosquitoes started at the left of the rigid squad. As each rifle was handed up, the *capitaine* pulled back the breech-lock and showed the bullet. The third gun showed a blank cartridge, for one of the firing squad rifles always held a blank so that no man would know for sure that he had helped deal death.

As the search went on, the air seemed to grow more and more tense. Four rifles now, five, six—Sunlight was sweeping over the green field, bathing in gold the pitiful figure at the stake, over which the priest was bending and saying rites. Only two rifles left now, and thus far all had contained bullets. The seventh *poilu's* gun was broken while the Mosquitoes stood by with growing puzzlement and frustration on their faces.

### CHAPTER III

#### A FADED DOCUMENT

IT came without warning. No one saw the small black object hurl to the ground. Not until there came a slight, hissing explosion did Kirby jerk around with a cry of alarm. And then already the field seemed full of smoke from a grenade-type smoke-bomb which gushed out acrid black clouds. In the thick of it, the Mosquitoes and the French milled confusedly. The wind dispersed the smoke in mere seconds.

"Stop him! There he goes!"

The wild yell ripped from Kirby's lips. The Mosquito leader was leaping madly across the turf, snatching out his Colt.

Already a good distance away, dashing straight towards the three idling Spads the Mosquitoes had left there, was the eighth man of the firing squad—a stocky figure with swart stubble covering the lower part of his face. He had thrown away his rifle and now, having delayed pursuit with that smoke-bomb, he was already up to the three planes.

"No!" Kirby yelled. "No you don't, damn you!" He fired his Colt even though he was still hopelessly out of range. Now Shorty and Travis were also whirling, running with drawn guns. The colonel of the *Deuxieme* was barking mad orders. The remaining seven of the firing squad turned to join the chase with rising rifles.

But all this took precious seconds, and in those seconds the fugitive was moving with lightning swiftness. He darted to the first plane in the line,

which happened to be Shorty's, raised the engine cowl, and reached in. His hand came away with snapping ignition wires—the running Kirby could see the flash of the short circuit, see the propeller slow and stop. The fugitive then leaped to the next plane—Kirby's. By then Kirby was pounding to the scene at last, again firing his Colt. After him pounded the others; rifles began to bark past him. The stocky fugitive ducked from Kirby's ship, jerked around his head. Kirby caught a glimpse of two greenish eyes, which even in the daylight seemed to glow lambently, like a cat's. Then, with a guttural curse which rose above the Hissos, the blue-clad man abandoned his move of destruction—and instead, before his pursuers could close in, he leaped like an agile monkey into the cockpit of Kirby's ship.

Kirby hurled forward, Colt upraised. But like some mocking laugh, the blast of the slipstream met his face. Black exhaust smoke billowed out at him as his own Spad, manned by the French-clad fugitive, fairly leaped forward. Obviously the hand that held its controls was the hand of a born flyer. With a fusillade of hopeless rifle shots sizzling after it, the plane went rocketing off the green, zooming hell-bent into the blue morning sky—and shrinking towards the east.

For an instant Kirby stood frozen, lines of frustration etching his face. Then he saw the lanky figure of Travis running past him on long legs, heading for the one plane the fugitive had left behind undamaged—Travis' own. The sight stirred Kirby to fresh action. He leaped forward again, overtook the lanky man, was shoving him back towards the gaping Shorty Carn and the gesticulating *poilus*.

"My job," Kirby gritted with frenzied haste. "If anyone has a chance to catch him, it's me!"

And before either of his comrades could answer, he hurled to Travis' ship, was in the cockpit with one heaving swing. He had the throttle slammed open even as he plopped into the seat. He had the safety-buckle fastened even as the Spad emulated the plane that had just taken off—skimming across the Vincennes field, rocketing over the prison and the tree tops, curving up towards the east and the Front.

Shorty and Travis stared helplessly after their leader, then stared at the one remaining mosquito-marked plane, whose damage would take a long time to repair. The colonel of the *Deuxieme* was stupefied. The *poilus* looked frightened and horrified. Only the black-robed priest was calm, and the pitiful corpse at the foot of the stake.

IN the meantime, up in the sky that was now sunny, Kirby was urging his borrowed Spad forward with all his skill and strength. His goggles were down, and through them he peered into the blue ahead—his glance fixed on the fugitive plane which was now just a small-winged shape.

It was going hell-bent. Even he could not have gotten more speed out of the ship he gave such good care, and which

was performing smoothly despite the lead it had taken before.

Cursing, Kirby reached into the compartment where Travis kept his air equipment. He yanked out a pair of binoculars, focused them to his goggles until the plane ahead grew to distinct size and shape. Clearly he could see the tin-hatted figure in the cockpit for now the other plane veered to the north, giving Kirby a moment's side-view.

And even as he looked, he could see a transformation come over that figure. A gust of propeller-made wind suddenly swept the French tin hat off into space. Immediately after came a wig of black hair which left a pate shaven almost bald as a skull! On the face, bits of false stubble were blowing in an ugly smear, as if the wind were shaving the man! It all took place in a second, that strange metamorphosis. A French *poilu* with Gallic features changed into an evil-faced, shaven-headed Teuton—a Teuton whose photographs he knew too well to be mistaken.

"Udermann!" he burst out. "So it is you, you skunk!"

He was not surprised, and yet now that he knew the fact to be true it brought a sense of rage and humiliation. Udermann, the wily chief of the Flying *Nachrichtenamt*, who had outwitted them all by one of the cleverest stunts ever pulled by any spy!

He had fooled that colonel of the *Deuxieme* by somehow smuggling himself in as a bona fide member of a French-picked firing squad—how Kirby could not yet guess. And he had fooled the Mosquitoes by killing Emil Rodet just before they could get the Frenchman's dying message. And then he had added insult to injury by stealing one of the planes the Mosquitoes had conveniently left ready for him, after crippling another.

Already Kirby had swung Travis' Spad northward, to follow the fleeing spy-crate. It was strange that Udermann was not heading directly for Hunland, but was instead cutting up towards the north this way. But if he hoped to elude Kirby by taking a round-about course, he was mistaken. Fiercely, Kirby kept hot on the trail, fighting to get more revs out of Travis' well-kept Hisso.

"I've got to stop that Jerry!" he gritted. "Got to get him—alive if possible. This thing must be bigger than it looked, if he took so much trouble to shut up Rodet!"

But though Udermann had not even glanced back at his pursuer, the wily Hun was leading Kirby a most merry chase. The only sense of passing time Kirby got was from the change of the landscape below. He saw it change gradually, even as he first began to gain on the Spad ahead. He saw the green contours turn to a sort of dull gray. He saw a snakelike line of rising smoke to the northeast ahead, and knew it was the Front, much deeper in France here than down south.

The Somme Front!

The Somme Front, which Emil Rodet had betrayed! Even now Kirby could see the futile British-French advance

which was hurling itself to death against the iron-bound Hindenburg line. He could see the moving smoke-lines of the barrages, could even make out the swarms of moving insects which were soldiers. He could see vividly now the full damage Rodet's forged orders had caused. For from the Hun trenches, the gray swarms were even now coming west like a returning tide—the Allied attack was being repulsed by a counter-attack.

And over this sector which Rodet had betrayed, Udermann was heading in his stolen Spad!

"What the hell can it mean?" Kirby cursed. "What brings this Boche skunk up here after killing Rodet?"

He broke off with an eager exclamation. For now, suddenly, the Spad ahead was slowing in its mad, racing speed. It was slowing even as it banked over a section of the area which was still in Franco-British hands. And as it slowed, Kirby's Spad gained in a spurting leap which in seconds would have brought him on the tail of Udermann, who obviously was unaware now that he was still pursued.

But it was then that the shrewd soldier in Kirby made him change his tactics. For the movements of the Spad ahead were strange. Slowing, that Spad was circling, wheeling like a momentary searching gull over a drab, shelled hamlet—a dirty little town surrounded by gray and black torn earth which Kirby recognized as coal-mines, remembering that the Somme was noted for its special coal of a peculiar gray coloring.

**D**ETERMINED to see what Udermann could possibly be up to, circling over this British-held town, Kirby now dropped aggressiveness for furtiveness. Deliberately, he slowed his own Spad, held it safely back so he could watch. At the same time he tried to locate the town. His glance went to the roll-map on Travis' dashboard—after a moment he picked out the location, the printed name. St. Pierre.

Something clicked in his brain. And then he remembered with a shock of surprise. The barking rifle, Emil Rodet slumping forward on the stake, that last gurgling cry from his lips:

"St. Pierre! St. Pierre!"

The truth stunned Kirby. Emil Rodet had meant the town of St. Pierre, this town here! He had seen the Mosquitoes, and in dying that was the very message he was conveying to them—trying with his last breath to name this town! They had not grasped it at all. But Udermann had understood!

Again Kirby broke off from his conjecture, stiffening. So sudden did the other slowed Spad dip, its wings catching the sheen of morning sun, that Kirby almost lost it from view before he saw that it was gliding down over St. Pierre, gliding for a stretch of clearing on the outskirts of the town. Udermann was landing in British territory. Though the spot was desolate and deserted.

Warily now, determined to chase this thing to its finish, Kirby approached the scene in a slow, high course. From over-

head, above a fringe of cloud, he watched the other Spad land. Through his binoculars he saw the stocky figure of Udermann climb out, start across the stubble field for a sprawling, ramshackle chateau which also seemed deserted.

Kirby's fingers hovered on his stick-trips. To dive down now and finish that damned Hun, helpless down there in the open—

But then he would never get to the roots of this mystery. And so he watched, holding back the impulse, while the blue-clad figure of Udermann went inside the house.

Kirby slipped his own Spad down through space then, as furtively as an eagle stalking its prey. He landed in a field separated by a copse of trees from the other crate. When he climbed from the cockpit, his Colt was in his hand and ready.

Warily, he moved across the ground, through the trees, approaching the ramshackle chateau into which Udermann had disappeared. He circled to the front side of it, lest Udermann be watching from within. He paused, listening to the thunder of shells in the east which seemed to be drawing closer. Perhaps he should get British or French help, which must be nearby. But if he took time to go for help, Udermann might disappear.

With this thought he steeled his nerves, gripped his Colt, and went to the front door. The lock of it was rusted and fallen into disuse. He held his gun level, and with his foot opened the door. A musty hallway met him. He darted in furtively, his every nerve alert, looking up and down. Somewhere in this old house—

A slight sound down the hall caught his ears. He whirled, gun poised. Then he saw a door, half-ajar. The sound seemed to come from within. Kirby crept to the doorway, peered in.

He was looking in a large room that had evidently once been a study, but which was now disarrayed and full of dust. And almost opposite the doorway, the blue-clad, shaven-skulled figure of Udermann was bending over an old-fashioned bureau. He had the top drawer pulled out, was hurling clothes and other stuff from it to the floor. Even as Kirby stepped into the room with gun leveled, a grunt of satisfaction came from the Hun spy—for now he had fished out a folded faded paper, which he stuffed hastily into his side-tunic pocket.

Kirby, eyes narrowed to slits, gun trained on the blue back of the Hun, took another step forward, ready to demand surrender. The Mosquito failed to notice that there was a dusty mirror on top of the old bureau. At the moment, Udermann's right hand was occupied, stuffing away the paper he had taken from the drawer.

#### CHAPTER IV

#### LOSER'S SPOILS

**E**VEN as Kirby started a crisp "Stick them up, Udermann," that move came. The German had not turned

from the bureau; his body itself seemed to remain immobile. But his left arm flecked back around his waist like a snake, gripping a squat black automatic. And before Kirby could pull the trigger of his own aimed Colt, Udermann—the fastest crack shot ever seen—fired!

Crack! The report split the confines of the musty room, as flame spat viciously from that squat automatic.

Kirby had done the only thing he could in that split second—ducked sideways with the flash of the pistol. It was the only thing that saved him from certain death, for even shooting left-handed and backwards, aiming by a mirror, the Hun was a deadly marksman. As it was the Mosquito heard the bullet whistle past his very ear, heard it ping into the wall behind. He jerked the trigger of his own gun, but his ducking movement had spoiled his aim—his bullet, too, went wide.

Udermann whirled. The Hun's face, livid in hate, looked more hideously like a skull than ever with its shaven head, its deep-socketed feline eyes. The gun jutted forward in his hand.

Instinctively, fearing to shoot it out with this man who was so superior with a pistol, Kirby leaped forward, swinging his own revolver like a club. The German side-stepped, met the rush with surprising strength. Cursing in a snarling guttural, he took Kirby on, stopping the Mosquito's gun-arm with his own revolver, which he had been forced to swing upwards, unfired. Hand-to-hand they fought.

Kirby, panting and cursing, unable to bring down his locked revolver, was striving to free his left fist, that left fist which carried such a sure knockout if he could only slug with it. But the German kept his left arm down. The Mosquito pushed and tugged against the Hun's blue tunic. At that instant, he felt a crackle of paper under his struggling fingers. The folded document in the Boche's pocket! The Mosquito quickly grasped the paper, but he did not get it all out, for a piece tore off and remained in the Hun's pocket. But the rest Kirby got without Udermann being aware of it, and he managed to stuff it somewhere within his own togs.

Though Udermann did not know what the Mosquito was doing, he sensed that Kirby's attention was momentarily diverted. With a lunge he managed to free his locked automatic, brought it down to Kirby's chest, viciously poking its barrel into the Mosquito. Kirby knew the cold foretaste of death, his every muscle ready for the fatal impact of lead.

There was a sudden pound of heavy boots, a rush of feet from the doorway of the room, guttural shouts.

"*Hanthofen!*"

Out of the corner of his eye, the horrified Mosquito saw four gray-clad pancake-hatted German soldiers pushing into the room, with leveled Mauser rifles. The sight of them crushed his last hope. Had the German counter-attack already retaken this territory or—

Amazedly, Kirby felt Udermann's

gun sharply withdraw, as the German spy chief whirled to face the newcomers. With deadly hostility in their eyes, they were charging towards both the men in the room—apparently taking the blue-clad Udermann for a Frenchman.

"Das bin—Ich Udermann!" he yelled. "You fools, I am not French—German!"

The four soldiers paused momentarily. In that flashing second Kirby noted that their uniforms were peculiar. Each had, on collar and sleeve, an insignia of crossed hammers—the Hammers of Thor, the ancient German thunder god.

And as the soldiers paused, the incredible happened. With a sudden savage snarl, Udermann whipped his automatic around—and was firing point-blank at his own countrymen.

At the first roar of his gun, one of the four gray-clad soldiers dropped like a heavy log, coughing out his life-blood. The other three gave cries of alarmed rage, jerked up their rifles again—and were aiming both at Udermann and at the khaki-clad Mosquito.

The dazed Yank acted out of sheer instinct. He ducked as a rifle roared and a bullet zipped past him. He brought up his own Colt and fired, cursing. A second Boche soldier went down, clutching his chest while blood spilled out over his fingers.

The war had never seen a more ironic moment than this hectic, bloody moment in the St. Pierre chateau. For now Kirby and Udermann, the two deadly enemies who had been seeking to kill one another just an instant ago, were standing side by side, blazing away at German soldiers. They were fighting as momentary comrades, though they hated one another!

The third Boche tumbled down as Udermann's deadly automatic continued its fire. The fourth, a light of utter frenzy in his eyes, charged forward crazily. Kirby fired at him—but only wounded his shoulder. Bleeding and screaming he came on. There was another crack from the deadly gun of Udermann—followed by a click that showed it was empty. But the last shot did its work. The last of the four Boche soldiers sank slowly to the floor in a crimson pool of his own blood.

**A** LITTLE DAZED, Kirby whirled around, still gripping his smoking Colt. And then a cry of fresh alarm burst from him—for Udermann, tossing away his own spent gun, was leaping like a panther towards the window. There was a crash of old, brittle glass—the French panes shattered as Udermann leaped out into the field outside.

Cursing, Kirby rushed to the window—fired his own last shot, which missed the running figure outside. He leaped out.

It was almost a repetition of Vincennes. Udermann was already up to the Spad he had left idling—Kirby's stolen Spad—before Kirby was out of the window and dashing after him. And while the Mosquito cursed himself for not having crippled that plane, the roar of the Hisso filled the air. Again Uder-

mann was rocketing into the air with breathless speed, zooming overhead.

Kirby sprinted madly toward the Spad he had left on the other clearing. This time he'd catch that Hun in the air, get him if it was the last thing—

A rattling moan jerked him to an abrupt halt. A whine which this time he recognized as the whine of shells! And in the next instant—

*B-r-r-O-O-O-O-M! B-r-r-O-O-O-O-M!*

The explosions deafened his ear drums. Flame, shooting up like an umbrella on every side of him, blinded his eyes. Barrage! The Huns were shelling this terrain—the counter-attack had not yet reached it after all, but was reaching it now!

The very earth seemed to erupt in front of his face. He was hurled several feet as if on a wave, and landed with every bone shaking in his body. A blinding flash and then he saw that both the clearing and his idling Spad had been obliterated, turned into a gaping, smoldering crater of ruin!

He was trapped! With the rain of shells growing thicker, with smoke clogging his nostrils and shrapnel whistling in his ears, Kirby crawled over the hellish ground with some thought of getting to the cellar of the chateau. But in the next moment there was another series of teethshaking explosions. The chateau had been hit now, and it disintegrated in a mass of crumpling stone and breaking glass. Thicker and thicker grew the barrage, and Kirby knew it was only a matter of time before he must be blown to hell.

The drone of an engine pierced the thunder of shells overhead. The Mosquito, half-sprawled on the ground, jerked up his eyes. Through the haze of smoke he saw a Spad slicing down in a circular course like a grim bird. A Mosquito-marked Spad. Was Udermann coming back to strafe Kirby, just to make sure he would be doomed?

He saw a face peer over the cowl of the circling plane. And at sight of that face, even with the shells bursting around him, a hoarse cry of incredulous joy broke from Kirby. For the face was round and it was goggled and helmeted.

"Shorty!" Kirby yelled. "Shorty Carn!"

Unmindful of the thundering shells now, the Mosquito leader lurched to his feet, was standing out on the smoky field, gesticulating wildly. And Shorty saw! The Spad promptly dipped, its Hisso sobbing out. At the same instant the barrage became so thick again that the concussions knocked Kirby off his feet. In alarm he started waving from the ground.

"No Shorty! You can't make it! You'll be blasted—"

But even if Shorty had heard he never would have heeded that warning. The little Mosquito did the most superb bit of flying of his whole career. Quick as a swooping hawk, his Spad came down through the inferno of roaring shells which rocked its very wings. Somehow, as if finding its way through the bursting shrapnel, it skimmed over ground that was still level, slowed.

Kirby leaped for it as if shot out of a catapult. He leaped to its nearest wing, swung on with an arm, was crawling up to the fuselage and getting a tight grip on the inner strutting, even as the Hisso roared anew in defiance of the shells, and the Spad cleared the field and was in the air in split seconds.

Not a moment too soon. Even as the ship, with Kirby huddled on its wing, soared into the free clear sky, the entire scene below was blasted out by a final rain of shells which left no spot unscarred.

"Are you all right, guy?" the shout reached his ears vaguely above the roar of wind. Shorty was peering from the cockpit. "And did you get that Hun—it was Udermann, wasn't it?"

"He got away again, damn him!" Kirby shouted, bitterly thinking that by now Udermann was hopelessly out of reach somewhere in Hunland. And then a sudden remembrance caused him to feel with one hand over his teddy-bear—and he sighed relief as he felt a crackle of paper. At least he had gotten something, something Udermann had apparently been after—

He held on as the Spad banked southward in the blue sky, Shorty doing the turn as gently as he could.

"Where are you going?" Kirby bawled then. "How did you happen to find me anyway, and—"

"Trav figured it out after talking with G-2—they said Rodet had a house in St. Pierre, when Trav told 'em the Frog had yelled that name in dying. We fixed the one Spad left, and I came rushing out after you. Meantime Trav went to G-2 where we are to meet him! General Saunders is all upset!"

**I**T was past noon when three grim-faced Mosquitoes were once more together, all of them seated around the desk of Brigadier-General Saunders, Chief of Yank G-2. The general, hard-eyed and square-jawed though he was, looked worried and haggard. The red rims around his eyes showed his need of sleep and rest. From time to time his glance went to a wall-clock, and from there to the large French window overlooking the lawns and traffic-filled roads of A.E.F. Headquarters.

"I don't mind telling you three men that my mind is utterly confused," he groaned. "I'm trying to think of two things at once. First there are these confounded Boche Terror ships—" The worry-lines deepened in his features as he tapped a sheaf of reports on his desk. "Every night the damage is more frightful—more important bases wiped out! You must give me all the details you saw. And I'm still hoping that J-7, the agent we sent across the lines to get the dope on the new menace, will come back—though he's hours overdue now."

He sighed heavily, then resumed. "And on top of that there's all this strange intrigue about the Rodet execution, and Udermann. The French *Deuxime* colonel has been of little help. He did find out how Udermann slipped into the fighting squad, though. When

the original squad filed out of the armory before dawn, Udermann diverted one man, strangled him in the darkness and got his uniform and gun—taking care it wasn't the one with the blank cartridge. But as for his motives—” His glance went to Kirby, who despite his hectic experience looked fresh again, after having grabbed a bite and washed up.

“And if I didn't know you as well as I do, Captain Kirby, I'd never be able to believe your story of Udermann shooting with you at Boche soldiers!”

Kirby smiled grimly. “If the house weren't wiped out you could see the bodies. And after all, there's *this* evidence.”

He nodded to the desk. There, with a piece torn off its edge, was the paper he had wrested from Udermann, who in turn had taken it from the bureau in the chateau. And again, as they once more looked at the paper, the Mosquitoes and the general showed grim bafflement.

The paper was a map, a home-made affair done crudely but with detail. It had no print on it, but already, with the help of some intelligence officers here, it had been identified as a chart of the Black Forest, of Germany.

Travis broke the silence with his drawl: “One thing seems clear. Rodet was trying to tell us where this map was when he died, and Udermann got it first. It must mean something.”

Travis hesitated. Then. “I was just wondering if there were any possibility that—”

He never finished.

Somewhere in the sunny air outside came a sound familiar enough to all Three Mosquitoes to jerk them out of their chairs. A sound like the whine of a shell much larger than any that had burst around Kirby at St. Pierre.

The general, too, had jumped up, his face going blank. “What—” he was blurting.

The whine became an ear-splitting shriek, even through the closed window. High and shrill it rose.

“Look!” Kirby was pointing at the window, his voice hoarse. “Look—there it is, coming!”

Even as he spoke there was the rush of a descending shadow. Frozen, the Mosquitoes and the general stared with wide-eyed horror.

Hurting toward the building with terrific speed, was a single stubby-winged mystery ship! Shrieking, it loomed swiftly to huge size, its cylindrical, rushing body glinting in the sun.

“It's going to crash the building!” Kirby yelled. “Duck or—”

He was already rushing to the general, starting to pull down that stupefied officer.

*B-r-r-OOOOM!*

Amazedly, the men in the room saw the blinding flash of flame and smoke, as the down-hurting crate suddenly exploded to atoms, still in mid-air. The concussion shattered the windows; outside wreckage was falling like rain. Then there was a milling rush of khaki-clad men from all directions of the grounds.

**T**HE GENERAL, followed by the Mosquitoes, dashed out. When they reached the crowd they found some of the G-2 officers bending over a scarred and crumpled form which lay in a battered heap on the wreck-strewn lawn.

One of the khaki officers gasped at the General. “The body fell with the wreckage, sir. We saw it come down.”

“Can it be?” The General's horrified amazement was reflected on the faces of the Three Mosquitoes. “Then this man was riding in that plane! How—” He pushed through, bent over the corpse, turned it partially over. And though the face was scarcely recognizable with its scarred features, a cry of recognition came from the general. Slowly, like a man stricken, he turned to the Three Mosquitoes.

“It is J-7!” he croaked. “My own agent. He came back—in that ghastly thing!”

Kirby's eyes slitted. “Maybe the Boches put him in it when they sent it over. They've done stuff like that before and—”

He broke off, for now Travis had suddenly stooped swiftly over the corpse. The lanky Mosquito, whose eyes never missed anything, was wrestling open the dead man's scarred hand and from it he pulled a scrap of paper, whose fringes were burned away. Only where the hand had covered it was it intact.

The General, Kirby and Shorty were peering over Travis' shoulder as the lanky man held up the scrap. The scrawled bit of writing on it leaped to their eyes:

“Secret of Terror is Rodetol.”

“Rodetol!” it was Kirby who echoed that last word, a dazed light in his eyes. “Rodetol—and the name of the Frenchman whom Udermann killed was *Rodet!*”

“Which means,” Travis' drawl was grim as death, “that all this intrigue about Rodet and this new mystery menace are connected—the very idea I was starting to express before!”

The general was not listening. His eyes were misty, his voice thick. “J-7—one of my best men. He must have got to their base. And now—” He shuddered. “If only he could have lived to talk!”

Kirby faced the harried chief. “He lived to bring us enough of a clue, general! And as soon as Shorty and I can get the spare pair of planes from our drome, the three of us are going out—out to the Black Forest! It's clear now that Rodet must have been trying to tell us something about the menace, and the map must concern it. We'll comb that damned woods until we find whatever is there!” He turned to his two tense comrades. “Right, fellers?”

And both Shorty and Travis responded with the famous, reckless war whoop of the Three Mosquitoes.

## CHAPTER V

### HELL'S LANDING

**T**HE BLACK FOREST! Kirby leaned over the cowl of his roaring new Spad, peered down again at the

sprawling mass of green which was one of the most famous woods in the world—a woods abounding in legends.

For hours now, having slipped unseen way into Germany here, the Three Mosquitoes had been combing the Black Forest, vainly searching like buzzards for whatever grim secret the dense woods might be hiding—a secret they felt Rodet had been trying to tell them. But thus far all they had seen was sprawling, desolate foliage—barbaric country.

*Rat-ta-tat-tat! Rat-ta-tat-tat-tat!*

There was no warning at all. The Mosquitoes were taken almost completely off their guard.

Checkered ships—the ships of the Flying *Nachrichtenamt*. And in their lead, trailing black streamers, a Fokker marked with Imperial Eagles that flew like the very wing itself—

“Udermann!” the cry burst from Kirby's dry throat! “It's his crate—he's back, leading his own squadron! It's a trap!”

Before Kirby could even wave his comrades to pull up, before the three Spads could even spring to the defense, the Fokkers of Udermann were upon them. They struck like a tornado, a cone of wings with Udermann's spitting ship at its tip. They flattened on all sides of the three Spads, and their smoky lines of tracer drew like a spider web about the three Yanks. Madly, as the air grew thick with flying, screaming lead, the Mosquitoes half-rolled, turned, dodged and twisted.

In fighting unison, the Yanks went hurtling against their many attackers, lunging in the reckless, insistent fashion which had won them their nicknames—truly Mosquitoes, with gibbering Vickers for stingers!

Together, the trio went hurtling around in a Lufberry circle which momentarily took them out of the criss-cross prison of lead. Even as they came around, with guns spitting, one of the checkered Fokkers grotesquely crumpled before them, went hurtling down like a dead bird with its pilot sprawled over the stick. Shorty Carn, the best marksman of the trio, had already scored!

A blasting hail of lead from above met them then. Kirby, jerking up, glimpsed once more the eagle-marked crate of Udermann, attacking furiously. Behind its flame-tipped guns and transparent propeller arc, Kirby could see the skull-like face of the Hun spy, swathed in goggles and helmet. He cursed and momentarily broke formation from his comrades, jerked back his stick and, pressing his triggers, sent a spray of vicious lead towards the Boche. But Udermann was as slippery as an eel—his Fokker whisked away, staying safely out of range of the Mosquito's deadly stinger.

At the same instant another Fokker, with a plume of smoke and flame gushing from its engine, plunged into the depths of the wood below. Travis had scored!

Kirby, unable to get a crack at Udermann, whipped his Spad down again just as another checkered ship whizzed

past him, left to right. He kicked right rudder, banked, and the Fokker fitted into the ring of his sights. Cursing, he fired a long burst—saw the Hun ship literally disintegrate before his withering tracers, which struck like a spear and impaled the Hun pilot to his cockpit.

**I**N THE SPACE of seconds the Mosquitoes had rid the sky of three of their tormentors, and even now Shorty crippled a fourth and sent it staggering away. But there were fully eight Huns left, and now, goaded to mad vengeance by the fall of their comrades, they rallied under a waved signal of Udermann and hurled upon the three insolent Yanks with overwhelming fury. The three Spads trembled, shook and lurched under the impact of combined lead from every Spandau.

"Stick close, fellers!" Kirby waved desperately. "Don't let 'em split us. Don't—"

He broke off with a cry of alarm, for even then he saw Shorty's plane being cut off by two Huns, being swept out of the V. Kirby pulled closer to Travis—desperately the two Mosquitoes tried to blaze through the wall of Fokker wings to get back to their comrade. But then again Udermann's eagle-marked crate came tearing down like a bat out of hell. A burst shot away half of Travis' tail-fins. The lanky Mosquito fought controls as his plane lurched and lost speed. And before Kirby could slow with him, three more Fokkers flicked in like winged snakes, cutting Travis off!

The Three Mosquitoes were outnumbered and separated—and separated they were as bad as dismembered! Cursing, with cold dread tightening in his heart now, Kirby was fighting alone amid lunging, looming Fokkers which were drilling his wings, cracking his struts. Desperately his eyes glanced about for the planes of Shorty and Travis. A groan tore from him, for he could not see them.

His desperation to get to them again lent him fresh fury. He bent to his controls, but his Spad was drunk with lead. Even as he opened fire on the nearest Fokker, there came such a terrific fusillade of Spandau lead that he knew it was the finish, knew it even before the joy-stick went limp in his hand as control wires snapped.

Dazedly he saw the blue sky and green earth change places; saw the earth spinning. A terrific pressure under his goggles, a sickening nausea in the pit of his stomach, were enough to tell him that he was hurtling down in a flat, fatal spin, miles and miles in Germany, over the desolate Black Forest.

Cursing, dizzy, Kirby was fighting the limp controls like a maniac. Then, even with the wood right below, he was getting some sort of control—at least the safety-wires on the flippers were still working. By using full throttle he was able to blast the Spad out of its spin, hurl it into a power dive, though he could not stop it from going down, and its wings were sea-sawing drunk

only. His desperate eyes swept the up-rushing forest below, picking out the nearest place that was at all clear of trees.

*Rat-ta-tat-tat-tat!*

The shrill clatter, splitting the air right behind him, deafened his eardrums anew. He felt his tail-fins vibrate as if invisible drum-sticks were beating them, heard tracer whistling past his ears. He jerked his head over his shoulder, and a frenzied curse tore from him.

Riding his tail, Spandaus blazing, was a single Fokker. At first the horrified Mosquito thought it was Udermann's—for it flew streamers. But it was not the eagle-marked ship; evidently it belonged to a flight commander. The Hun had warily followed the Spad down like a vulture, and the moment Kirby's plane had recovered any control he had swooped to make sure of the kill.

**T**HE MOSQUITO threw all his skill and strength into a reckless move. Although he knew the reserve-controls were unable to stand any strain, he nevertheless crossed stick and rudder, whipped his screaming Spad into an abrupt, shivering stall which hung it momentarily above the woods. The speeding Fokker was carried past by sheer momentum before the Hun could recover from surprise. It slithered by, was above and ahead. And Kirby had his joy-stick back to his very chest. His Spad was rearing like a bucking broncho. For one fleeting instant, even as the reserve-control wires snapped like twanged mandolin strings, the Mosquito caught the underbelly of that Fokker in his sights. He pressed his triggers again and again while the Spad flapped off like a fish out of water to fall drunkenly.

But even as the Spad flopped down, Kirby felt a surge of savage satisfaction as he glimpsed the Fokker nosing over, to plunge like a stone into the woods below and crash. Another instant and he was making a last struggle with all that was left of his own controls. Somehow, using the power of his motor alone, he managed to get the Spad just over the tiny clearing, managed to keep its nose up at the last moment. There was a rending crash, a shivering impact which rattled his very teeth. The undercarriage of the Spad buckled as if made of match-sticks; the fuselage slid to the ground like a half-capsized canoe while wings buckled.

Even as he was hammering at the safety-buckle, the pungent smell of smoke assailed Kirby's nostrils. He saw the flame-tongue jut from the engine before him in the next instant, felt its excruciating heat as it grew to blinding, livid size. Instinctively he clutched the Black Forest map tightly as, getting open the safety-belt, he literally rolled out of the wrecked fuselage. He sprawled to the ground then was on his feet and running.

Nor had he been a second too soon. Right behind him the fire rose in a sheet of crackling flame and smoke. The Spad was burning to cinders.

Kirby paused some distance away.

The yammer of Mercedes overhead jerked him up with a start. Over the tree-tops he saw checkered Fokkers, swooping low. Hell, it was the entire Udermann outfit coming down, evidently to land somewhere in the woods! They must have seen the flaming Spad. Kirby would never get away.

Even then, as he ducked momentarily out of sight behind the nearest tree, he heard whining wires that indicated throttled motors, knew the Fokkers were landing close, on some other clearing. Huns would be here in no time. Even if he fled they were sure to find him in his telltale khaki. He was too far from the lines to hope for escape.

His desperate glance swept around the tiny clearing, the dense trees. Suddenly his eyes sharpened. Across the clearing was the wrecked Fokker he had downed at the last moment—crashed with its nose buried in the ground, and with a still gray-clad figure in its cockpit.

Swiftly, Kirby drew his Colt, rushed to the wrecked Boche crate. One glance into the cockpit told him the Boche was dead; a Vickers bullet had penetrated his skull. There was little blood. And the man was almost of Kirby's own build.

The Black Forest was coming to life with running feet. Udermann's Fokkers were still sliding in for their nearby landing. Kirby worked with lightning speed. In no time he had hoisted the dead Boche out of the cockpit; in no time he was changing his own teddybear for the striped gray tunic of the Hun. He found identification papers: *Uberleutnant Karl Wolff, Fliegende-Nachrichtenamt. Flight Commander.*

He pocketed the papers, buttoned up the gray flying coat which was just a little tight, jammed on the Boche helmet and goggles. He shoved his own map, compass, and a few other belongings within his borrowed tunic, changed his own Colt for the German's Luger.

In the next instant he could hear them coming this way, guided no doubt by the flames of the Spad. He redoubled his speed to finish his grim work. Stealing his nerves to do it, he lifted up the dead, stripped corpse of the Hun, staggered with it to the sinking flames of the Spad. Getting as close as he could to the searing heat, he flung the body directly into the fire. There was an uprush of crackling sparks.

Then, even as two Boche pilots broke through the trees, the Mosquito wiped his grease-stained hands over his face to partially obscure his Yank features.

The two pilots, arriving at the clearing, saw a burning Spad with an already charred, unrecognizable body in the midst of the flames. And, walking away from a wrecked Fokker, was a trim, gray-clad flight commander who was hurrying from the scene. Without turning towards them, the flight commander barked at them in flawless German:

*"Achtung! Der Amerikaner—get his corpse from the fire if you can! Identify it."*



As if there would be any chance! By the time that fire burned down there would be nothing left of the corpse. But the two pilots were saluting, going close as they could to the sinking flames.

## CHAPTER VI MYSTERY SHIPS

**K**IRBY, grateful that his German was so much better than his French, was going through the trees. Outwardly calm, keeping his stained face averted as best he could, he was passing other pilots. If he could get away now—

Even with the thought he broke off, every nerve tautening. For as he went through another copse of trees, he came abruptly on a large, stubble clearing. Wings filled it—revving Fokkers. Gray-clad pilots stood on the ground, grouped in one spot. And facing them, the Mosquito saw a familiar stocky figure, with a face that resembled a skull!

Furtively, Kirby ducked back, remained in the background. For Udermann was sharp-eyed, and Udermann would remember his face from St. Pierre. He heard the Boche's rasping voice even then:

"Then we did get all three of them?"

"It seems so, *Herr Oberst*," answered one of the flyers. "We cut off the two, and though they came together, they were seen to fall. The third—their leader—burned, it is said."

Kirby felt a wave of grief and horror. His two buddies, Shorty and Travis, downed! His fists clenched at his sides while hate narrowed his misting eyes. Damn Udermann and his murdering Boche-pack! Damn—

"*Gut!*" Udermann said. "Then we are rid of those insolent Mosquitoes at last! But we bungled just the same! We should have let them locate the secret place before we—"

"*Ja*, but we thought they had spotted it when they banked," said one of the others. "And we could not wait forever; they had been flying over the woods for hours. Are you certain, *Herr Oberst*, that they had the location on their part of the map?"

Udermann growled an oath. "*Ja wohl!* When their swine leader fooled me by getting most of the map, the little piece left in my pocket did not have anything on it. And after all my trouble too! When that *verdammte* Frenchman yelled 'St. Pierre!' after I shot him, I knew where to go at once. But the swine Mosquito leader tricked me! And unless he and his comrades were blind fools, they should easily have picked the secret stream in this wood, located the estate of von Bergsten!"

Von Bergsten! Kirby's nerves became like electric wires. Why, von Bergsten was the other Hun with whom Emil Rodet's name had been linked—the mysterious Hun who bore the name of a famous dead German scientist!

Quickly but unobtrusively, the Mosquito withdrew a little from the Fokker-filled clearing, got behind a clump of trees. Assured that he was out of sight of all eyes, he once more drew out the torn Rodet map, glanced at it swiftly.

He must find a stream. His eyes lighted. There was one, obvious from its zig-zagging course and dark lines which indicated water.

And, having noted his own position in the woods even as he fell from the air, Kirby knew the stream lay just a few miles away—into the south. Though it was not marked on the map, von Bergsten's estate was somewhere along that stream.

In that instant, standing just a stone's throw from Udermann and the group of Hun pilots, the Mosquito reached reckless decision. His first thought had been to somehow make a break for one of these idling Fokkers—try to get back to the lines. But now his mind was on a different track.

To abandon escape, to deliberately stay in Hunland seeking out a secret base, in a uniform that made him technically a spy—it was a desperate resolve. But with Shorty and Travis downed, Kirby was too reckless to care about the odds, and the whole Allied cause was at stake.

The Mosquito moved like a furtive Indian. Head bent low, he slinked off, a shadowy gray figure through the trees, working away from the Huns, careful as he stepped over twigs and underbrush.

When he had left them behind, he pulled out his pocket compass. From it and the Rodet map he got his bearings, began to journey due south.

**I**N less than an hour, already panting and foot-weary, he came upon the stream—a narrow, coursing brook. The next question was which way to follow it. He consulted the map. He was near one end of the stream and it seemed to lead out of the woods. His instinct told him the place he sought would be in the thick of the forest. He took the opposite direction, commenced to follow the stream, working along its right bank.

It was an arduous and lonely journey. The further he went the more desolate the woods became. Tree-shadows grew longer as the sun slowly moved down westward.

And then suddenly, even as a heavy gnarled cluster of tree-roots and brush almost blocked the path before him, the Mosquito stiffened, ears acutely alert. Out of the darkening woods ahead came a swishing, rumbling sound which, in the loneliness, seemed almost terrifying, making Kirby think of ancient dragons. And with that sound came another—the sound of heavy pacing boots, the clink of rifles!

The Mosquito quieted his jumping nerves, put a hand on his borrowed Luger. Warily, he crawled around the gnarled impasse of tree-roots. He came into some brush on the other side, worked through.

His eyes widened in amazed awe. For he found himself peering out at an immense clearing, a stretch of well-kept lawns. And at the far side of these expansive grounds reared an enormous castle of vine-covered stone. An old Teutonic castle, no doubt a heritage of feudal times. Etched in the gathering dusk against the old trees of the Black

Forest, it looked so medieval, so in keeping with the grim legends of this woods, that the tense Mosquito half-expected to see warriors in armor.

There were warriors all right, though not in armor! Surrounding the entire castle, pacing the grounds everywhere, were pancake-hatted, gray-clad Boche soldiers, with bayonet-tipped Mauser rifles.

Never had the Mosquito seen a more tightly guarded place! In the very next instant he crouched low, despite his German uniform, as one of the pacing guards tramped by scarcely ten feet beyond the brush. Even in the dusk the Mosquito caught a clear glimpse of the gray uniform, and as his eye fell on its collar insignia a stifled gasp rose in his throat.

The crossed hammers of Thor! The same insignia that had been worn by those four Huns at St. Pierre whom Udermann had crazily slaughtered with Kirby!

With growing wonder the Mosquito continued to take in the whole scene. At first he had been puzzled that he and his comrades had not spotted this place from the air. But then he saw that the roof of the castle was covered with green camouflage—vine and foliage which matched to perfection the green lawns and trees on the ground. From the air the castle would be merged with the earth, unnoticeable, unless one knew just where to look for it.

At the far left side of the castle, Kirby now saw an immense, old-fashioned water-wheel, turned by the passing stream. It was this wheel which made the swishing, rumbling sound that had reached his ears before.

The next instant his attention was caught by something else. With a clattering noise, a huge lorry came out of a tree-shaded road, approached a side door of the castle. Two of the hammer-marked soldiers were in its cab, and in its open rear was a full load of—coal! Coal which, despite the dusk, showed a peculiar, unmistakable grayish color!

Kirby stared. The thing seemed incredible, but there was only one place where that coal could come from.

The Somme—the sector which Emil Rodet had tried to make the British-French armies regain! The Somme, which must now be safely in Hun hands again, since this coal must have been brought from it.

"Why?" Kirby breathed the awed question half-aloud, still peering from the brush. "Why on earth—"

He broke off, and what he next saw jerked his every nerve taut, made his heart leap.

Being wheeled from another side of the castle by a group of coveralled Boches, was a strange, cylindrical shape of huge size which gleamed in the dusk.

It was one of the Terror ships!

In his excitement, the Mosquito almost threw caution to the winds. He had wormed his way to the very core of this whole diabolical mystery. Here in this medieval castle in the Black Forest the secret lay.

Second thought, however, brought

fresh caution to the Mosquito. He did not yet go out into the open. Instead, stealthily, he began to work his way around the fringe of brush and trees, until he came to a place directly opposite the spot where the Boches had halted with the mystery plane. It was close enough for Kirby to see it clearly in the dusk.

HE was thunderstruck, stunned, incredulous. He had expected to see some entirely unfamiliar machine—some propellerless, pilotless ship with rocket devices on it. Instead, though the mystery ship was indeed almost futuristic in appearance, it was a genuine airplane! An airplane with all the usual parts—engine, propeller, and cockpit.

Men must fly these things—after all. The reason no helmeted pilots had been visible was clear. The cockpit was sunk deep in the fuselage—deep enough to protect the pilot completely from the rush of wind which otherwise would be fatal.

The plane itself was metal-covered—some aluminum alloy, doubtless. It was beautifully stream-lined from nose to tail—even its stubby wings, sufficient to hold it in the air at such high speed, were tapered off. Its wheels were covered and close beneath it. The propeller was enormous, and there was a bulging engine cowl. There were the usual forward guns—though they seemed to be of a new type, thin-barreled instead of surrounded by a perforated outer barrel.

But how could this plane travel so fast? Kirby saw no answer to the question. There was a limit to what petrol and engines could do. And how did the machine guns fire so fast that they made a steady stream of battering lead?

Kirby's furtive glance went to the cowed engine. It looked like a huge Mercedes, bigger than usual but no different.

The coveralled Boches were examining the strange ship, which evidently had something wrong with it. They were shrugging, shaking their heads. And Kirby, still in hiding, was steeling his nerves, once more summoning up reckless resolution.

He rose to his feet behind the brush. Carefully, he straightened out his gray uniform as best he could, rubbed his grease-stained face. With an inner prayer of hope, Kirby threw back his shoulders, trying to assume the arrogant air of a Prussian. Then, deliberately, as though just arriving, he stepped through the brush and was striding across the twilight grounds.

He got past the broken mystery plane, got another look at it which showed him its controls were the same as any other plane controls, before he was noticed. Then, like a sudden wall, a whole crowd of the Boche sentries rose grayly before him, blocking the way to the castle, menacing him with their bayoneted Mausers. He was staring into dark muzzles, above which rose hostile, challenging faces.

"*Dumkopf!*" he barked out, in the guttural tone of a haughty officer putting inferiors in their places. "Let me

through! I must go to von Bergsten at once!" He was playing his hunch to the limit. "Here—my papers! I am *Uberleutnant* Wolff, of the *Nachrichtenamt!*" And with a brusque, impatient flourish, he whipped out his stolen identifications.

A stocky *feldwebel* with a stony face seized the papers, glanced at them in the dying daylight. Kirby waited hopefully. The *feldwebel*, his face unchanging, glanced up from the documents. He crisped out an order.

TO Kirby's horror, the menacing rifles closed in on him in a ring—bayonets prodded through his very clothes into his flesh. Before he could move rough hands were seizing him, stripping him of his gun, of the Rodet map, of everything else. Instinctively, he tried to struggle—cuffing blows stunned him into absolute submission. Helpless, pushed and prodded by bayonets, he was being marched towards the castle—a prisoner! Somehow they must have seen through his disguise at once, knew him to be a spy!

The castle doorway loomed. Other Boche sentries moved aside. Kirby was taken in.

A blinding flood of light was the first thing that met his eyes—that, and a hissing, liquid sound, and a faint but strangely pungent odor which was a little sickening.

And as he marched, silent and grim-faced amid his prodding captors, he saw the strangest of all sights yet at this strange hideout in the Black Forest.

It was difficult for him to believe that he was actually within the walls of this old castle—for the interior was as utterly modern as the exterior was archaic. Almost the entire building was occupied by one immense chamber, through which Kirby was being taken. A chamber lighted by myriad electric bulbs which revealed how much power that water-wheel outside could create. A chamber filled with huge vats and pipes and wheels—gleaming machinery, with iron stairways and catwalks running between it and coveralled Boche workmen who swarmed about like ants.

What had looked like a castle was in reality a flourishing factory, a thriving industrial plant!

But Kirby had little chance, as he was pushed and dragged along, to see just what was going on here. Another instant and the *feldwebel*, walking in the lead, had paused before a door at the front wall. He knocked on it with discreet knuckles, then opened it.

The helpless, captive Mosquito was pushed through into a large, well-furnished office, whose huge window overlooked the twilight expanse of grounds outside.

A figure rose from behind a mahogany desk—a tall, spare figure with a shock of white hair and a face which, though filled with deep lines, nevertheless held a certain nobility of feature. And at once that face struck Kirby as strangely familiar. Despite his predicament his mind was struggling with memories of newspaper pictures.

"Herr von Bergsten—" the *feldwebel*

was saluting the tall figure. And at that instant Kirby's mind clicked, and he knew. This was the von Bergsten! This was the German scientist whose fame just before the war had been world-wide—the Edison of Germany! The great von Bergsten, who had been reported dead of heart failure close after the outbreak of the war, but who now stood here, looking worn and old, but very much alive.

"Ja?" the voice of the scientist was deep, resonant. "You say he presented some papers?"

The *feldwebel* handed them over in silence. Kirby stood, helpless amid the still-menacing ring of Mausers. Von Bergsten glanced at the papers, put them down on the desk. Then he looked at the torn Rodet map—and as he did so an expression as of pain deepened the lines around his blue eyes. His glance narrowed then as it raised to Kirby, who had been pushed before the desk.

"So you are of the *Nachrichtenamt*, *Uberleutnant* Wolff?"

It was so much more a statement of fact than a question that Kirby's hopes soared. Why, von Bergsten was accepting him as a Hun, accepting his false identity! He was not going to be shot as a spy, not—

Then his eyes went wide with fresh surprise and horror. For even as he was nodding his assent to the question, he saw von Bergsten's lined face go livid. The blue eyes were like glacial pools. With a sudden curse which betrayed an almost volcanic temper, the German scientist whipped up a Mauser pistol from the desk, pointed it at Kirby's head.

"You snooping swine!" his voice was a roar now. "I feel like shooting you like the rat you are!"

Kirby could only stare into the menacing black muzzle, so close it looked like a cannon maw. Then, suddenly, von Bergsten seemed to control his rage with an effort; he partially lowered the pistol, gestured with it to the Boche soldiers, crisped an order.

## CHAPTER VII

### MURDER SCIENCE

TWO of the Huns remained to menace Kirby with their Mausers from behind. The others filed out the doorway. More were outside the window; and von Bergsten, Mauser pistol in hand, faced the Mosquito from the front. Kirby was still trapped; still unarmed and helpless to make a move.

"So you found the map!" von Bergsten grated. "You found it and came snooping here, despite all the promise I had from the High Command! *Ach*, you are all contemptible! I would have more respect for you if you were an Allied spy instead of a German—at least then your snooping would be balanced by bravery!"

Kirby could have laughed hysterically at the irony of these words. The fact that he was being taken for a German seemed to put him in a worse predicament than if he had been betrayed as

a Yank!

"If you were of the enemy, you would be shot; yet now, because you are a German—" Von Bergsten broke off with a curse. Then suddenly his blue-eyed gaze fastened on the Mosquito's grease-stained face. He was giving Kirby a scrutiny so keen that the Yank felt as if his very soul were being read. "You are of the flying branch, I see. And young, too." The German's voice softened a little now. "It is bad, bad. Tell me, why did you ever go into the *Nachrichtenamt*?"

Kirby answered with careful judgment: "I was chosen by my superiors."

"You do not look like their breed. You do not look the type who would stab fellowmen in the back, who would resort to the vilest tactics to gain their ends in the name of patriotism." Contempt edged his deep voice. "Patriotism without honor is uncivilized barbarism! You have flown in the sky," the softer tone deepened in his voice and a strange glow came now into his blue eyes. "Doesn't that mean anything to you? Isn't aviation itself worth more than all this stupid, bloody battling and treachery on the ground?"

"*Ja wohl*, it is!" Kirby answered, and was surprised by his own sincerity. Something in the tone of this white-haired old scientist was making him feel a liking for the man. "I think flying is more wonderful than anything else one can do," he was saying warmly.

"Yet, you come snooping here like a rat," von Bergsten repeated. "Why? To ferret out the secret for your chief, Udermann! Do you think he cares what happens to aviation? No, he thinks only of the present, of this war that will soon end one way or the other, while flying will go on. You are young. Can you not consider the future? Do you not want to see airplanes change from the crude frail craft they are now to sturdy machines that can fly at incredible speed over incredible distances?"

Kirby had listened with growing awe. He was almost oblivious of the two menacing guards, oblivious of von Bergsten's pistol, and of the bustling factory outside the door. This German scientist fascinated him. The man had the magnetic personality of the true visionary, peering into the future.

"I swear, *Herr* von Bergsten," his voice was still sincere, but the shrewd soldier in him, playing the spy, was gaining the upper hand. If he could only get to the bottom of this whole mystery now—"I swear, *Herr* von Bergsten, that I knew nothing of all this. *Oberst* Udermann never told me—"

"Yet you have in your possession the map drawn by a man who, though of the enemy, is dearer to me than all of you put together! A man whom," his voice shook, "I was fool enough to betray—in the paltry name of patriotism. I betrayed Emil Rodet; I was silent to his coded message. How," his eyes misted, "can I dare face him again?"

Kirby was almost on the verge of telling the German he would never be

able to face Emil Rodet again under any circumstances. But he restrained himself. The soldier now had completely the upper hand. He must find out everything he could.

"Pardon me for my ignorance," he lied now. "I do not know who Emil Rodet is. The map you speak of—Udermann gave it to me. And I did not snoop here, *Herr* von Bergsten: I tried to come openly, when your men seized me." He shook his head. "This is all most confusing. You make me feel ashamed, yet I have done nothing I thought wrong."

It was a shrewd speech, aimed directly at what he thought was the German's character.

"I do not know yet what to do with you, *Uberleutnant* Wolff. But since I see in you a young flyer, energetic, capable—I shall tell you what as yet I have told no outsider. No, do not move from where you are. Stand still and remember you are covered."

He himself moved to a desk chair, sat down, his Mauser pistol before him. The two Boche guards near the door remained vigilant, their rifles gripped and ready. And as Kirby stood a prisoner, von Bergsten began a story which soon held the Mosquito enthralled, a story which—only because he was a young flyer who happened to appeal to von Bergsten—he was getting freely from the German scientist's own lips.

IT began many years before the war, when von Bergsten was at the height of his scientific career. At that time von Bergsten interested himself in the airplane, then a new thing. And even then von Bergsten envisioned aviation of the future—streamlined ships that flew with projectilelike speed, conquering space and gravity. And working with von Bergsten, as an assistant, was a Frenchman named Emil Rodet—a rich man with lands in several parts of France who, rather than waste his riches in idle luxuries, threw them and his own unflagging energies into the same cause as von Bergsten.

"Both of us saw that the secret we must fathom was how to make engines go fast and powerfully enough; how to propel such ships through the air," the scientist said.

Kirby nodded, not daring to speak for fear of breaking the continuity.

"Petrol improved with time of course. But there was a limit to the force and speed of explosions you could get. Rodet and I considered different propellants—even rockets, but we were unsatisfied. And then, as Fate would have it, found the answer on Rodet's own properties in the Somme sector, or rather Rodet found the answer. He found that by distilling the peculiar slate-mixed coal that is to be had only in that section of country, a new type of petrol could be secured—a petrol fully ten times as explosive as any now in use! That was how Rodetol—for we named it after him—was born!"

Kirby was trying hard to keep his face a mask, to show only normal interest—not stunned amazement. For now, like the pieces of a jig-saw puzzle

clicking into place, all the mystifying events were at once becoming lucidly clear.

He and Rodet knew that they had the secret of airplane speed in their grasp then. But there were obstacles. The fuel, Rodetol, had to be distilled at normal temperature, and it came out in a gaseous form—a vapor which had to be compressed to make a liquid petrol. For this the two men found an artificial but difficult method—and here von Bergsten was suddenly tight-lipped. He would not tell how they had done it. "However," he said, and now the pain again etched his lined face, "we saw that we had only made a temporary bridge over that gap. Though we had a way of producing a liquid fuel, it was dangerous—*nein*, even suicidal, to try to put it to real use in airplanes as yet. It could only be used in experiments. To give it to flyers would be risking their very lives in every flight. We both agreed, Rodet, and I, not to release Rodetol to the world until we could find a way of rendering it safe and sane. And then the war came!"

It was here that the story of amazing aeronautical science took on a note of tragedy. Under the shadow of war, the two friends—officially enemies now—had parted, both agreeing to stay out of the war itself and work independently on the new product, both promising not to release it to either side. Rodet had retired to St. Pierre. Von Bergsten, knowing the fanatic militarism of his own country, had been forced to take a stronger measure—he had faked his own death, had the report given out. Then he had retired to this castle here, inherited from his feudal ancestors—a castle whose existence was unknown. And here, carrying over another custom from feudal times, von Bergsten had a whole corps of "serfs" who lived on his property and who, when he called them, became his own private army—wearing uniforms with the family coat-of-arms: the hammers of Thor.

Secretly, von Bergsten had constructed his factory, to continue working on the Rodetol formula. And then came the grim, swift tide of national events.

"The years passed. I saw Germany being beaten back, crushed, for I was not blind even in my isolation. A new country came against us with its fresh young blood—the United States. Our armies were in retreat. Desperately our leaders strove to win the war through the air; but the Zeppelin failed under anti-aircraft guns. The airplane was beaten by the airplanes of the enemy. Our great aces—Boelke, Immelmann, Richthofen—all went down. Can you not see how I felt? I who knew I had a secret which, despite the danger of its use, could make our air force so superior to the enemy that we could wipe them out? Can you not guess with what emotions—when at times I secretly visited Berlin or some other city—I saw the troops, with younger and younger faces, marching to battle, while the wounded and maimed came straggling back? And when, in my work, I discovered a way to make Rodetol a little safer—"

He broke off, as if a constricting sob had momentarily choked him. Kirby did not move, but full understanding showed in his eyes. The German hardly needed to finish. The rest was obvious enough.

VON BERGSTEN had written a letter to the High Command, telling them he was alive and that he knew how to give them victory in the air. He had had no idea of doing it on a large scale—not with Rodetol so unsafe. Nor did he intend to let them in on the secret. If they gave him a free hand, and did not try to find his base, he would show them how to make ships for the new fuel, and supply enough fuel to at least balance the tide of war.

There was no danger of Rodet doing the same thing for France. For Rodet had already lost his coal properties in the Somme—they were in German hands, which made it possible for von Bergsten to procure all the special coal he needed.

The business of the new Rodetol-propelled ships was given to the *staffel* of the *Nachrichtenamt*—Udermann's *staffel*. Meetings were arranged between von Bergsten, Udermann, and others of the Imperial Staff. The new ships were made and kept on Udermann's secret drome. And secretly, von Bergsten had his own private army men bring coal to the hidden castle, where he manufactured the new fuel and sent it to Udermann with equal secrecy.

"No sooner had I begun than I realized what a monster I had created! The new fuel, with all my secret improvements, was still dangerous to use. It killed as many of our flyers as the enemy—the new type planes would explode in mid-air.

"I had the large Mercedes engines specially constructed, with a new, revolutionary cam shaft which could take care of the powerful, rapid-firing Rodetol. I used large propellers with a low pitch angle to keep them from tearing off their mountings. I improved the stream-lining; and for the guns, which fired so rapidly when synchronized with these whizzing propellers, I used a new processed steel.

"Still the chief danger of the Rodetol itself was not eliminated—ships continued to explode. But Udermann cared nothing for this sacrifice of human life.

"He kept calling for more Rodetol—he himself had learned how to manufacture the ships at the Gotha plant. Udermann secretly planned that he would get an enormous fleet of the new ships—enough to wipe out the Allies in one mighty raid. In this I refused to co-operate—

"Udermann was furious by my refusal. He threatened me, but I said if he tried to find my plant . . . if he betrayed the High Command's promise, I should destroy my entire factory and bury the secret of Rodetol forever. This checked him. Yet all along I have known that he has been snooping, trying to discover the location of this base. To forestall him I sent four of my men to try to get Rodet's map. Without it Udermann would not even have known

that it was in the Black Forest, so well did I keep my operations covered. But now . . . you, *Uberleutnant* Wolff, had come here, with the map—"

Kirby stiffened as the story brought him back with a shock to his grim surroundings. His mind had been piecing together the last links of the whole chain. Rodet causing that drive in the Somme—to regain the coal-lands of course, no doubt with the thought of trying to manufacture Rodetol for France to counteract his former partner's treachery. Then the failure of the drive, Rodet naturally not revealing the secret after that. For it would be useless to France without the coal—it would only further establish Rodet as a traitor.

Then, too, Rodet probably was as yet not fully convinced of von Bergsten's treachery: he had been trying to get into communication with the German, to learn the facts. Faced with death, he had at last appealed to the Three Mosquitoes—and here his motive had been similar to the motive that had prompted von Bergsten to tell his story. The Mosquitoes were flyers who would care about the future of aviation, be willing to fight for it.

And then another thought jerked Kirby's nerves taut. Udermann! Why, Udermann had not known the location of this Rodetol factory—had tried to find it by taking that map at St. Pierre! He had only gotten a small piece of it, but that piece had evidently been enough to tell him the hideout was in the Black Forest. Knowing shrewdly that the Mosquitoes, with the rest of the map, would come, he had laid his trap, determined to let them lead him to the spot he sought. But as he had said, he had attacked too soon. The Mosquitoes had still been ignorant of the location. And now—

"Herr von Bergsten," Kirby spoke almost desperately in the silence of the guarded office. "I am grateful for your confidence. I see the situation you are in—I wish you would take me on your side, temporarily at least."

Von Bergsten rose. His eyes were sharp, narrow. "I cannot forget that you are of the *Nachrichtenamt*—that they can teach even a young flyer like you the tricks of snakes. If you are trying merely to trick me—" his hand closed on his gun. "Even now I do not know whether to allow you to leave this place or not."

"I assure you I am not going to trick you," Kirby said. And inwardly he was thinking the Allies must be notified—this place must be wiped out somehow, even though he'd hate himself for betraying von Bergsten. Yet von Bergsten himself said he would rather see it wiped out than have the menace be built into a monster. "Let me go, *Herr* von Bergsten. Let me talk to other young flyers in my corps. I'm certain they will see this thing eye to eye with you—that they will refuse to continue flying the new, suicidal ships."

A glint of eagerness came into the scientist's blue eyes. "If only I thought it could be done," he murmured. "If only I—"

He broke off, and at the same instant Kirby's frame went suddenly rigid.

## CHAPTER VIII DEATH'S PLAYTHING

WITH terrible abruptness the twilight outside had been shattered by the yammer of motors—wide-open Mercedes motors! And even as von Bergsten gave an alarmed cry, even as the two sentries in the room started up, paling, pandemonium broke loose!

Down from the sky over the clearing came swift flitting shadows darker than the dusk. Fokker D-7's—checkered Fokkers, of the *Nachrichtenamt*! More than a score of them this time—and in their lead an eagle-marked, streamer-flying crate, the plane of Erich Udermann himself!

Even in that first stunned instant Kirby realized what had happened. Udermann, having been shown this part of the Black Forest by the unwitting Mosquitoes, had gotten his whole squadron together and managed to find the place!

The gray-clad guards outside were running confusedly like chickens without heads. Fully a dozen of the Fokkers, led by Udermann, were slicing down with engines sobbing out, landing with precision on the wide expansive lawn. The rest, with bombs protruding from their underbellies, were wheeling overhead like menacing birds.

Von Bergsten, pistol in hand, had turned to the window to fling open the French-type panes. Now his eyes jerked from the window to Kirby, who was standing frozen, as his plan of escape was already nipped in the bud. The scientist's pistol whipped up again towards the Mosquito.

"You lying *schweinhund*!" he was grating. "So you were not trying to trick me?"

Kirby, again seeing that pistol maw before him, could only dart a trapped glance out the window. Even as he looked he saw the Hun pilots who had landed climbing from their ships, Luger pistols in hand. And still in their lead, was the stocky, skull-faced figure of Udermann.

The sentries of von Bergsten's army had rallied to rush towards the landed Huns with leveling rifles now. Udermann waved at them threateningly, then raised his voice so that its rasp carried clearly to the open office window:

"Von Bergsten, call off your dogs, do you hear? My planes that are still in the air will blow this place to the devil if one shot is fired at us! We're coming in!"

Even as he spoke, as if obeying the unheard command, the Fokkers overhead swooped lower, their bombs visible.

So suddenly did von Bergsten make his next move that Kirby didn't realize what was happening until, against his right temple, he felt the cold pressure of steel. The scientist, a light of utter desperation in his blue eyes, was pressing his Mauser pistol right at the Mosquito's head. Von Bergsten, pistol

against Kirby's temple, yelled out the window:

"You are checkmated, you swine! I have one of your officers—*Überleutnant* Wolff! Go back to your planes and go away, or I shall put a bullet through his skull!"

Udermann's voice rose: "It is bluff! Come on, let us pay no attention!"

"Bluffing, am I?" von Bergsten's yell rose in Kirby's ear. "Well, look for yourself." And to Kirby, savagely: "Get over to that window, *schnell!* Hurry, or I pull this trigger!"

The Mosquito saw that it would be certain suicide to disobey. With despair in his heart, he moved, perforce, to the window. He tried to keep his grease-stained face in the shadow of the room-light, but the gun in his temple literally pushed his head around.

A shout of indignation burst from Udermann—a shout which told Kirby the Hun spy chief knew this was not his Flight Commander Wolff at all. And at a fresh command, while the Fokkers overhead kept the gray-clad sentries from daring resistance, Udermann and the group of pilots deliberately advanced towards the castle again, Lugers gripped.

Von Bergsten gave a desperate oath. His finger closed on the trigger of the Mauser pistol. The pistol roared.

A split second before it fired, Kirby had moved. With sudden unexpectedness, he had jerked his head—literally pushing the pistol partially aside with his own temple. And at the same time he brought up a swift left fist doubled into a ball. The blow glanced from the scientist's jaw, stunning him and sending him backwards. He shouted in fury, tried to whip up the gun. Kirby grabbed at it like a drowning man clutching a straw, wrested it from von Bergsten's grip. The two Boche soldiers at the door were already lowering their rifles, aiming as they moved with guttural oaths towards the Mosquito.

Kirby whirled, jerking the Mauser trigger. Crack! One of the two Huns stopped in his tracks, a vacant expression coming over his face as his knees buckled and he fell, his rifle clattering to the floor on top of him. Von Bergsten leaped at Kirby like a wildcat then, displaying surprising strength for one so old and worn. He grabbed at Kirby's neck with both arms, pulling the Mosquito back. The second Hun soldier came charging in with bayonet fixed. The Mosquito jerked around with all his ebbing strength, managed to point the Mauser once more even as the glistening bayonet lunged directly towards him.

**T**HE MAUSER flamed again. The bayonet slithered away as the second Jerry went down like a log. Then Kirby himself was knocked off balance by a second rush from von Bergsten, whose face was livid with fury, the eyes blue flame. The two sprawled to the floor. Kirby writhed madly, trying to push off the leechlike German.

As if to nip the very thought in the bud, he heard a pound of feet at the doorway. The room filled with guttural

shouts, rushing shoes. And even as von Bergsten at last rolled off Kirby, a rain of kicks and revolver butt blows stunned the Mosquito.

The next thing he knew, he was jerked to his feet, held up like a scarecrow by a whole group of savage-faced *Nachrichtenamt* pilots, who prodded him with their Lugers. He took in the scene bitterly. The office was in the hands of Udermann's men. Outside more *Nachrichtenamt* flyers were finishing the disarming of the guard, and the Fokkers from overhead were now landing one by one.

There was another step at the door, and Udermann strode in, his death-like face lighted with an evil expression of triumph. His greenish eyes flickered towards the captive Mosquito as he passed without stopping. Across the room there was a movement. Von Bergsten, disheveled, looking even older than his years now, was brutally pushed in front of the Hun spy chief by two more pilots.

"You swine!" weakly rose the voice of the scientist. "You have no right to trespass on my grounds."

Udermann calmly took out a cigarette case, selected a long Turkish cigarette, put it in his thin-lipped mouth and lit it.

"Von Bergsten," his voice was blighting, "it is not you who are to dictate terms now. We happen to be in a hurry. Within the next hours—as soon as the flyers I sent back can report the location of this castle—a newly completed fleet of the new type planes will arrive here on trucks. By midnight those planes are to be fueled with Rodetol—every one of them, and there will be at least thirty. We will take off from these grounds—my men can smooth a big enough runway."

A chill apprehension tightened about Kirby's heart as, amid his ring of captors, he heard these words. And he saw his own horror reflected in the pale face of von Bergsten.

"No!" the scientist cried. "No, you can't do this, Udermann! It will mean the finish of my product! The High Command promised—"

"The High Command," Udermann smoked calmly, "is fortunately most alert and not blind. The High Command has given me full charge and responsibility regarding the use of the new type planes. We are not going to delay any longer. We must strike while the iron is hot. Tonight—" his voice rose now with savage triumph; his greenish eyes flickered, "tonight our fleet will make the previous raids look like child's play. We will strike Chaumont first, and cripple their entire nerve center. And then—"

He paused, and a wave of horror coursed through the listening Mosquito. Already he could visualize those new rocketlike ships, a huge fleet of them, swooping down on Chaumont, slaughtering G.H.Q., then running rampant all over the Allied lines.

"No!" again von Bergsten's voice rose in furious negation. "You won't do this to me, Udermann! It is absurd, fantastic! I refuse to have anything

to do with it. The secret of manufacturing Rodetol is still known only to myself and my loyal servants—and you can kill us rather than open our lips! I refuse, do you hear?"

Udermann's face grew suddenly lean, wolfish. He flung his cigarette to the floor, stamped on it as if it were a bug. "Von Bergsten, there are ways of making you comply. If we take a batch of your private soldiers and shoot them, perhaps that will move you."

"*Verdammt*, you wouldn't! You—"

"I hope such tactics will not be necessary," the cruel Hun's voice was suddenly silky now, conciliatory. "I am sure you will be reasonable about it, *Herr* von Bergsten. After all, why should you resent it that I finally found your plant—when, before me, two *verdammt* Allied spies have already penetrated it!"

The scientist started, his eyes widening. "A lie!" he blurted.

"First," Udermann ignored the interruption, "there was their man—J-7." He picked up one of the new type planes from my secret drome, flew with it back to them. My own agents report that luckily the ship exploded before he could land. But now another spy has penetrated your own plant, the most dangerous man the Allies could send." He spoke without looking at Kirby. "I thought only cats had more than one life, but evidently a Mosquito has more also."

"Mosquito?" von Bergsten echoed dumbly now. "What do you mean?"

"I mean," Udermann's voice was deadly now, "that the man you idiotically tried to pass off as *Überleutnant* Wolff is actually Captain Kirby, leader of the Yankee Three Mosquitoes. His face, even stained with grease, I would know anywhere."

**V**ON BERGSTEN went rigid, then whirled to look at Kirby. The Mosquito, knowing the game was up, stood silent amid his captors, his face a mask.

"You mean that man is a Yankee Swine? And I confided in him? I—"

"See for yourself. The Three Mosquitoes all have a price on their heads, as you may know. Here is a little circular issued to the *Nachrichtenamt* showing their photographs. Regard."

He fished a paper from his pocket, handed it to the scientist. The latter scrutinized it, then walked closer to Kirby, peered at his face.

"It is true! He is Captain Kirby! And he tricked me!"

Udermann was quick to carry on: "Yes, that swine American penetrated your plant. It is fortunate for you—for all of us, that he did not get away before we arrived. You have been blind, von Bergsten. With all your brain absorbed in science, you let other things escape your notice. You speak of honor, of keeping promises you made to a certain enemy, when all the time you are being betrayed."

"But not by Rodet!" the scientist broke out then, as if clinging to a last vestige of illusion. "Rodet has done nothing—it is I who betrayed him."

"Rodet," said Udermann, "is dead. I

killed him—never mind under what circumstances.”

“You killed Emil Rodet?” the scientist cried, with frenzy now.

“Wait. I killed Rodet to shut his mouth, do you understand? He was ready to give everything he knew to the Allies, put the secret of the new fuel within their grasp. You do not believe me? Then how do you suppose this American, Captain Kirby, found his way here? How do you suppose he got Rodet’s map? Do you not understand—the Allies know enough to ruin us, and they have none of your scruples! Unless we make one good job of it with the new ships, Germany will go down completely!”

It was clever, diabolically clever, Kirby thought, the way he spoke—painting the picture in his own color. And the worst of it was that the Mosquito dared not try to correct the story—to tell that the Allies did not know the secret, which was probably the very information Udermann longed to hear.

Von Bergsten was standing like a man stricken, anguish on his features.

“I guess you are right, Udermann,” he burst out. “I have been a fool. War is what it is. One cannot keep clean in a cesspool! My product seems to be ruined for future use now—but,” his eyes blazed, “the enemy will not have the satisfaction of using it against us! Bring your new ships, bring them all! I will make that fuel if it is the last thing I do!”

Udermann’s green eyes lighted, and Kirby felt his last hopes drain.

“Wait!” the scientist cursed. “It has just occurred to me: the thing is impossible. We cannot manufacture so much fuel in such short order. You will have to postpone the raid.”

“It must go tonight!” Udermann demanded. “You must find a way. My men will do your bidding.”

“It is not that. It is the distilling tank. Even when we are merely producing normal amounts of the fuel, it is a danger for the workmen to operate that tank. We cannot prevent leakage because air must get in—and in the making the Rodetol gives off an odorless, invisible vapor which is deadly. One of my men died last week without knowing what happened to him. In a rush job like this where several men will have to take turns going to the tank, it may prove suicidal!”

“Can’t you turn it off once in a while when the fumes become deadly?”

“There is no way of telling. As a matter of fact, we could probably get out all the fuel needed before the danger arises, but since we cannot tell when that moment comes—I dare not risk my men. There is no gauge; I have been trying to invent one.”

Udermann cursed. It was obvious he didn’t care whether men were killed or not, but he had to deal with the more humane von Bergsten.

**T**HERE was a momentary pause. Kirby’s captors, still menacing the Mosquito were giving their attention to the discussion now, the Yank noted.

With a gritted oath, he lurched from the grip that held him—tried to break out of the ring of Lugers. His fist catapulted before him, smashing to one pilot’s jaw, sending the man down. Madly, cursing, he tried to leap for the open window then. But they were too quick for him.

He struggled madly, futilely, as he was banged and kicked into submission. Panting, glaring hatred at them all, he was once more being held up like a scarecrow, and now one Luger was pointing straight at his heart. The swart-faced Boche who held it was shouting across the room:

“Let us shoot him and be done with it, *Herr Oberst Udermann?*”

His finger was eagerly tensing on the trigger. But Udermann, turning, held up a restraining hand. The Hun spy chief came up to Kirby for the first time now—the skull-face loomed before the Mosquito, and in its greenish eyes Kirby read that his death was still certain, even though delayed.

“So, you still hoped to escape, Yankee swine?” Udermann’s voice held a strange note of ironic venom now. “Unfortunately we are short of men, and it has occurred to me that you might be of help to us.” He turned over his shoulder, to von Bergsten. “You say you lack a gauge to tell you when that distilling tank becomes too deadly to approach. Well, your problem is solved!”

Von Bergsten looked bewildered, but Kirby understood at once, and a wave of clammy chill horror enveloped his whole being.

“You dirty rat!” he blazed out. “You can’t get away with this! You can’t—”

Again he tried to struggle, but now his captors were wary enough to hold him in a viselike grip. Fresh blows silenced him. Udermann was already explaining to von Bergsten who seemed horrified but angry and desperate enough to assent.

They took the cursing, struggling Mosquito out—dragged him out like a sack of wheat. Out into the immense factory chamber, where workmen scurried and the vats bubbled. They took him to a huge upright tank from which clay pipes led out. Up an iron spiral stairway to a landing close to the top of this tank, where air-holes showed, and other pipes came down. Ropes were produced. Helpless, the Mosquito was bound hand and foot to the rail, so that his face was right over the air-holes of the tank. He could not move.

Udermann climbed the spiral stairway, confronted the bound Yank. “They say that the best way to snuff out a mosquito is with some sort of vapor,” the spy chief smiled murderously. “Your death will warn the workmen when the tank is dangerous to approach.”

Kirby’s face was livid. He strained futilely against the bonds which held him to the rail. “Damn you, you Boche devil!” he gritted. “If I only could get my hands on you, I’d—”

“You have tried that already. This time, my friend, you and your comrades picked the wrong man to match.”

He barked an order and he and his men left the writhing Mosquito, climbed down the stairs. Von Bergsten stood on the floor, rasping orders now. Shrill whistles blew. And in another instant the factory became a bedlam of activity, a saturnalia of sound.

The workmen of von Bergsten swarmed like ants. Vents were opened. There was a roar of coal coming in a chute—beneath the bound Mosquito the tank was opened and he saw that coal pouring into it. Chemicals hissed through pipings. Von Bergsten strode around, his shock of white hair dancing in the light, his arms gesturing orders. Udermann and his pilots stood by, armed and watching, but evidently afraid to mingle with the activity lest von Bergsten call it off. The scientist was guarding the secret of his process.

The vent of the tank below Kirby clanged shut. Over his head a pipe lowered mechanically fitted into an opening hole, and he heard liquid splashing through. The pipe lifted. Within the tank came the hissing sound of distillation. It had begun!

## CHAPTER IX

### RESURRECTION

**T**HE Mosquito had stopped struggling against his bonds now, since it was useless. He must at least try to save his breath, so he could hold out—though he had no hope. Sooner or later the deadly, odorless vapors would be coming up right under his face and he the human gauge, would be snuffed out!

Now two workmen climbed the stairway, went past him, to work levers which evidently controlled the water-flow. They did their job confidently, for the human gauge showed it was safe—then climbed down again. Another pair came a few minutes later, and this continued.

The Mosquito tried to occupy himself by watching the work. He could see that the stuff from this tank, made when water and chemicals were poured upon the coal, went through the clay pipes to the other end of the chamber, where there was a closed room vigilantly guarded even from Udermann’s men by von Bergsten’s soldiers. That must be where the Rodetol was turned, by the “temporary” process, from a gas into a liquid. The thought was confirmed in the next moment. Workmen emerged from the room pushing wheelbarrows, on which stood large metal tanks. Rodetol tanks! Ready for the planes.

Time dragged. Outside moonlight swept the lawns. And presently from the road in the woods, huge lorries were emerging. On them, their wings short enough not to protrude, were the new type, projectile-shaped planes! Workmen and Hun pilots unloaded them onto the lawn; and each truck was sent away with a Fokker, which had to be dismantled.

One by one the Rodetol tanks were being borne out, evidently placed in those new ships. And other trucks were arriving with bombs and ammunition!

Kirby’s despair increased with each

passing minute. Faced with a horrible death which might strike him at any instant, he could only watch helplessly while the lawn filled with those projectile-shaped ships, which gleamed in the moonlight. Already the array of them had chilled him to the marrow. When they took the air, swooped over Chaumont—

The lights began to blur. That was the first sensation Kirby felt at all, and it came suddenly. He knew that something was happening to his senses. For now the lights seemed to break out into myriad colors. The Mosquito's nostrils began to sting. A clammy sweat broke out on his body.

The vapor was beginning to do its work!

The Mosquito tried to breathe more slowly. If he could hold out against it. Two more workmen came up. He stood scarcely breathing at all. They turned the levers, went down. Not yet—he alone was getting it, being right over the air vents. He must hold on—hold on. He exerted all his will power to control his lungs.

Slow nausea seeped into the pit of his stomach; his throat became dry, parched. The whole room was swimming. His ears began to shriek—then he knew it was not just a sound in his head, but a sound outside. Hazily he peered towards the big windows. He could make out the new type ships, lined up wing to wing now. Livid sparks came from several of them. Their engines were being revved, making that shrieking sound which in the air would be ten times magnified. They were getting ready to go; most of the petrol had been made already. Hours must have passed.

Death was seeping out of the tank, and Kirby fighting to stall it. Now two more coveralled workmen were starting to climb the stairs. The vapor should be strong enough now. The Mosquito was holding his breath again. If only it would make those workmen, who were breathing regularly, crumple up when they reached the top of the stairs. If only they got a real lungful.

**H**IS brain was spinning. The shriek of Rodetol ships outside was pounding his eardrums. The two workmen seemed to climb the stairs with painful, snail-like slowness. Kirby did not think he could hold out. In that moment, holding his breath, his mind went to his two comrades—Shorty and Travis, who had fallen before him. Soon he would join them. He knew then that his mind was wandering; in his daze the faces of the two ascending workmen seemed to become the faces of Shorty and Travis.

Funny—there was Shorty's round, corpulent face; and there was Travis' long countenance, tight-lipped as ever. And the closer they came—they were almost at the top of the stairs now—the more clearly defined became their features. Kirby, still holding his breath, blinked his eyes. Mustn't be seeing ghosts now. Those were two Boches, two workmen who he was trying to make commit suicide by staying alive

himself.

"Take it easy, feller! We'll get you out in a jiffy!"

Shorty's voice. Certainly no doubt about that, even though it came in a terse whisper which would not be heard below, above the bustle of the plant, the whine of Rodetol ships.

Hell, it was no delirious vision! A mad, incredulous joy surged through Kirby's being, even though he still held his breath. Those two men dressed as von Bergsten's workers were Shorty and Travis!

Somehow, they were here, were coming to their leader as they always came, as all hell had never stopped them from coming! Coming to pull him out of this horrible death-trap, to—

And then, even as they were reaching the iron landing, Kirby's joy turned into sudden panic. All this time he had been holding his breath, knowing that when he expelled it he would only get a lungful of the odorless vapors. And Shorty and Travis obviously didn't know about that vapor—they were breathing free and full. When they came here— The trick he had hoped would doom two real workers now threatened his own buddies! They were facing death, without knowing it!

Indeed, even the shrewd, lanky Travis was oblivious of the peril into which he and his little comrade were going. That Kirby was in a state of daze and weakness both Mosquitoes could see; but they did not know it came from fumes. Their whole thought was centered on getting to him, getting him free, now that they had found him.

Fate had literally guided the two Mosquitoes to their leader. This afternoon, separated in that dogfight, both had managed to get away from the *Nachrichtenamt* ships with their own Spads shot to hell. Both had crashed. From that time, still knowing that the secret base must lie in the Black Forest, they had continued their search on foot. It had been unrewarded until well after nightfall. Then, footsore and despairing, the two Mosquitoes had seen a truck clattering along a road. It was one of the trucks from Udermann's drome, bearing on it one of the Rode-ships.

The two Mosquitoes had unobtrusively hitched onto the vehicle, which had driven straight to the hidden castle here. But before it reached the grounds two of von Bergsten's workers had joined it from the rear. They had come directly upon the two hiding Mosquitoes. Shorty and Travis had unceremoniously used their silent revolver butts. They had finished the workers, thrown their bodies into brush after swiping their coveralls.

Yes, Fate had guided them. As workers they had entered the factory unchallenged, their faces concealed in the darkness. As workers they had spotted Kirby tied to the rail. And as workers, at Travis' shrewd decision, they had gone up the ladder like other pairs of Germans, ostensibly to operate the levers.

And now, eagerly, they were on the landing, coming towards Kirby and the

deadly vapor they did not know about. And Kirby was in an utter panic as he saw them come closer to where the stuff emanated from the air-holes. In another instant—

The leader of the Mosquitoes, sick and almost ready to collapse, reached his decision then. He opened his mouth. He used what was left of his breath to grit out, distinctly:

"Hold your breaths, guys! There's gas here! There's—"

Before he could say more, his lungs, working organically, against his own will, quickly sucked to get in more air. And the whole chamber seemed to go dark; he felt himself sag against the ropes which held him, felt himself passing out.

Smack! The blow on his cheek, delivered by Travis, was almost vicious. Smack! Again, shocking him partially out of his daze. He did not know that already Travis and Shorty, having heeded the command to hold their breaths, had worked with lightning haste. He did not feel Shorty's pocket knife cutting loose his bonds, did not feel them dragging him away from the tank, thrusting a gun—for they had three between them—into his limp hands, which took it mechanically.

But the slaps Travis gave him were bringing him out of it, that and the air that was fresh away from the tank.

"*Vas ist!* Look! They have untied the prisoner!"

The shout broke shrilly from one of Udermann's pilots who was watching below. It rose over the din of the factory, the din of ships outside.

And that yell, followed by other yells as the alarm spread through the plant like wildfire, roused Kirby completely from his daze. His muscles rallied; his body straightened with his own strength, his hands closed on the gun. He was like one returned from the dead, returned with new life-blood flowing through him.

**H**UN pilots and workers as well were rushing toward the bottom of the iron stairway now, bringing up rifles. And then Kirby, thoroughly alive, was gritting to his two comrades: "Come on, guys! Don't let 'em stop us now!"

And once more came the inevitable response, which showed the Three Mosquitoes were reunited again: "Let's go!"

Shorty Carn, marksman of the three, had already whirled with a gritted oath to the driveway. As Boche started up it, firing cautiously, fearful of hitting the inflammable tanks, the little Mosquitoes gun—a stolen Luger—flamed and spat viciously. The leading Hun fell backwards, knocking the rest down with his dead, falling weight. Kirby led the way to the opposite rail. "Jump, guys! I can make it—don't worry!"

And in turn, the three men climbed over the rail, leaped down through ten feet of space to the floor below. They landed sprawling but with their feet under them. Together, all three of their guns spitting now, they catapulted forward, heading for the nearest exit—one of the doors.

A fresh wave of Germans from out-

side suddenly blocked the doorway, charging in with leveled bayonets. At another shout from Kirby the Yank trio whirled, zig-zagged in a different direction. They were trying for one of the windows now.

"Get them, you fools! They are all three Yankees!" Udermann yelled again ducking somewhere in the background. The window loomed, but the Yanks saw the Germans were again cutting them off. As they backed to fire their Lugers anew, Kirby almost tripped over one of the clay outlet pipes which he knew took the Rodetol, still in gas form, to the secret room. His eyes lighted desperately, flicked from the oncoming Boches to the pipe. He leaped forward with head bent low to a spot where one of the plugged Boche soldiers lay, rifle sprawled beside him. Shorty and Travis covered their leader with their own fire as she seized the rifle, ran back with it to the pipe.

While the Germans rallied and were closing in, he swung the rifle as he would swing an axe—brought its heavy butt crashing down on the pipe, yelling at the same time! "Be ready to hold your breath, guys!"

Crash! The pipe shivered. Kirby raised the gun again. The Germans seeing what he was up to, renewed the speed of their oncoming charge. Shorty and Travis used almost all their remaining Luger bullets then—stemming the tide momentarily. Down went Kirby's gun-butt. Crash! A huge portion of the pipe broke like so much glass.

Hiss-s-s-s-s. Yellowish white clouds billowed out from the opening, poured out like a flood. There was a stifling stench, though at once Kirby knew these fumes were not as deadly as the odorless ones that came from the distiller itself. But they were stifling enough to do lots of harm.

Swiftly the clouds were billowing out into the chamber, filling it with a yellow fog. Already the Mosquitoes were running through the midst of the stuff, heading blindly towards the window. Boches were pounding around in confusion now. Men could be heard choking, falling from the slow but insidious effect of the fumes. Von Bergsten's voice rose somewhere in the sea of vapor: "Verdammt, be careful! If it is ignited—"

"Here's the window, guys. Stick close!" Kirby was already climbing a sill, hurling his frame at glass which shattered into a thousand pieces, stung his cheeks. The three leaped out into the night—where the air was hideous with the whine of revving Rodetol ships.

In the shadow of the window, where smoke billowed out, the Yank trio was unseen by the frantically running guards out here. They paused a moment, to take breath.

The whine of Rodetol-powered engines suddenly rose to an ear-splitting scream. The three Yanks saw several of the planes leaping forward like ignited rockets, trailing fire. Hun pilots were hastily climbing into others. In the moonlight they glimpsed a familiar stocky figure rushing to one crate, jumping in. Udermann! He was taking

off, his men with him! The raid—Chaumont—

"We've got to stop 'em!" Kirby gritted then. "Fellows, those crates are powered by a new fuel—which is apt to explode, because it has only been turned artificially from a gas to a liquid. But we've boasted we can fly anything with wings—and Udermann's out to wreck everything in sight! Are you with me?"

And even before the other two chorused another "Let's go!" the three were dashing madly across the grounds. Already Udermann's ship and two others were in the air, filling it with an unholy racket as they zoomed so swiftly that they seemed to shrink right up in the moonlit sky. Others were streaking down the long runway of the lawn. And now from the building Huns were pouring out of the billowing smoke, staggering as they tried to renew pursuit of the Yanks.

The Mosquitoes reached the line of ships in one mad spurt which almost took away Kirby's last wind. Three Hun pilots saw them coming, whirled to meet them with up-whipping pistols. Shorty's gun spat twice, getting one, wounding a second. Kirby leaped in with a terrific swinging left fist which caught the third flush on the jaw, and sent him sprawling, cold.

More Rodetol ships were already taking the air—at least seven of them were off. The Mosquitoes shouted: "Luck!" to each other, then leaped for the low-sunk cockpits.

Kirby got in the center of the three chosen planes, settled down in the seat, hastily fastened the safety. His hands groped for the throttle lever. Like a turtle he raised his head to see that his comrades were in their crates then waved the reckless signal: "Take off!"

**H**E slammed open the throttle. The shriek that followed split his eardrums. The blasting slipstream threatened to tear his head from his neck before he ducked low under the triplex windshield. He felt the plane moving under him, so fast that his stomach seemed left somewhere behind. He jerked up his eyes only to see that two other ships were moving alongside of him. Trees rushed by with breathless speed—then trees loomed ahead.

The Mosquito leader eased his stick forward. So readily did the controls respond at this rate of speed that the crate almost somersaulted before he could pull the stick back again. Then he felt a lift as if he were riding a sky-rocket—and with another perk of his eyes overside he saw the ground and the dark castle dropping away with sickening speed.

Kirby waned, used his rudder ever so lightly, banked with equal gentleness. His Rodetol crate veered around, swinging way across the sky. His comrades followed, sloppily, but close as they could. In split seconds they had circled back over the castle, where they could still see the yellowish smoke billowing. The rest of the fleet of Rodetol planes were starting to take off now—almost a score of them, moving like

silver, spark-spitting streaks across the lawn.

"Stop 'em, guys!" Kirby could not hear his own voice in the shriek of the engine. But he knew his comrades were following him as he eased the stick forward. Again his stomach turned upside down as the crate careened sickeningly, went rushing down, the ships of Shorty and Travis beside it. The castle grounds rushed up so fast that the inexperienced Yanks overshot. They zoomed and were down again in the next second.

This time they were swooping right on top of the fleet still skimming the earth. Kirby found stick-triggers—the spade handle type. He thumbed them.

The special guns emitted a series of detonations so rapid that they sounded like one prolonged roar under the shriek of the ship. From the three diving crates of the Mosquitoes tracers went cascading down like golden hail.

And the aim was true. The ships below crashed, somersaulted, and flamed under the withering fire. The lawn was already a shambles. The Three Mosquitoes, fighting together as always, even though they flew planes years ahead of their time, had stopped all the rest of Udermann's grim fleet from the take-off.

Zooming, Kirby again managed to poke up his head, to give a new signal to his comrades. They must try to overtake the seven ships that had already gotten off and were now out of sight, winging with Udermann in their lead towards Chaumont.

Kirby hesitated in the split seconds while he and his comrades zoomed. The castle below must be wiped out if the Hun menace was to be forever silenced. Yet, when Kirby thought of von Bergsten, the German who dreamed of the future of aviation, he hated the thought.

But war was still war, any way you looked at it. The Mosquito leader knew there were bombs under the racks of his ship, and those of his comrades. He had already found the toggles. With grim pain in his heart, he was waving the signal and the Three Mosquitoes were swooping down anew towards the castle.

**B-r-r-r-ooooooooom!**

The terrific explosion silenced the very shriek of their engines, as without a single bomb being dropped upon it, the entire castle below went up in a mighty, livid mass of flame which made the sky as light as day! And all that was left was a gaping, smouldering crater of ruin!

Von Bergsten and his secret, his workers and his soldiers, were gone!

Either the gas from the broken pipe inside had somehow been ignited and exploded, or else—and Kirby somehow inclined to this view—von Bergsten himself, as a final atonement, had blown up the place with his own hand.

Kirby, with wild haste, waved again to his comrades—whom he could barely glimpse on either side.

"Udermann and the others, now!" he was waving. "Before they hit Chaumont! They can still blast it!"



THEY needed only the stars to guide them in the right direction. The three screaming ships whirled to the west. And then the three reckless Yanks, who knew that the mere riding in these ships might prove suicide, were trying to make their mad speed still greater!

And despite the peril of it, despite the flogging wind which was almost tearing off his face, Kirby felt an uncanny thrill—as if in this moment he were living the dream of all aviators—the dream of traversing space at a speed which rivaled the very planets in the universe.

They hardly knew when they had crossed the lines, so swift did the fiery swath of the battle front sweep beneath them. Hell-bent they raced on. They must catch Udermann before it was too late.

And then, suddenly, Kirby's eyes lighted as they peered through the windshield. Pin-points of red pricked the sky ahead—dark rushing shapes. Seven of them—flying in a V with Udermann undoubtedly at point. And they were near the back areas already—getting to Chaumont! The way it looked, they would get there before the Mosquitoes could overtake them!

Then, even as Kirby waved for still more speed, hope soared in him—for now, approaching Udermann's flight from in front, was a whole fleet of night-flying interceptor Camels. English crates. They must have been up in the sky watching for signs of the menace, for they were right in front of it, coming like a winged wall to meet it.

For an instant, as the English guns flamed in the night, the seven Rodetol-ships seemed to slow momentarily. Then a cry of horror burst from Kirby's lips. For he saw the seven Hun ships spurt forward like seven fired shells. They seemed literally to tear into the English squadron which outnumbered them; and their rapid guns sent a whole avalanche of lead before them.

Camels fell off grotesquely, twisting down like dark, dead birds—flaming across the sky like fiery torches, falling to pieces before the withering rapid fire. All in the space of minutes, that British squadron was shot out of the sky by these swift ships which flew like the wind itself!

But there had been a momentary delay; and now Kirby and his two comrades, goaded to grim vengeance, shot their own Rodetol-crates on the last lap of the journey. Already, shrewdly, Kirby had led his comrades to a little higher altitude, and now he was rushing with them down a long hill of space, straight for the other squadron hurtling ahead of them.

The seven ships loomed swiftly. The Mosquitoes bent to their trips. Their three pairs of rapid-firers roared in unison.

One of the seven ships was caught immediately in their fire. It staggered off, fell like a stone. The others promptly veered from their formation, whipped

up like a bunch of thrown stones. They had been quick to see the situation, to know that these three sister ships must be manned by Yanks. And now, with superior numbers, they came as if to make short work of them.

Blasting lead from their chorusing guns met the three Yanks, whistling in their ears, banging into their hurling crates. The next thing they knew they were in the strangest and most desperate dogfight of their careers! A dogfight in which every maneuver took up whole miles of space—in which antagonists appeared suddenly and then were out of sight altogether in the next instant. A dogfight not of this war, but of some future war—when such speed would be possible!

Kirby was whipping around to keep with his two comrades when he felt his own crate lurch under a sudden well-aimed impact. Glancing back he saw one of the Rodetol-crates swooping for his tail. He could not see its low-seated pilot, but from the marksmanship of those shots he knew it was Udermann.

A yell of berserk rage broke from his throat. He had his own ship around in a flash. He went for Udermann's crate with guns blazing, saw it half-roll on its stubby wings—and hurl through miles of space in a side-slip. But he was after it just as quickly.

Again the other ship loomed out of the night. Kirby fired, missed, and Udermann came tearing for him with both guns winking flame. The Mosquito's ship lurched again. The German was still the better marksman.

But the German had not been tied brutally over a distiller, to be used as a human guage. And Kirby suddenly was hurling his crate towards the other like a streak of silver lightning. He was somehow keeping after it, and his guns were vomiting tracer at a terrific rate.

Most of those shots went wild. But there were some that didn't, for in the next instant Udermann's skull-like head suddenly came into view. His body jerked up right from the cockpit as if a marionette on a string. His hands clawed the air. His face changed from the semblance of death to death itself.

The ship he flew carried him like a plummet to earth, where a column of livid flame announced its landing. The spy had died as he deserved—slaughtered by one of the very ships he had so treacherously obtained.

IN the meantime, up in the sky above, Shorty and Travis were putting up a desperate fight against the five remaining Rodetol-ships. Kirby saw his comrades' crates—which he recognized from their position—taking lead, lurching, even as he zoomed frantically. He joined them in the next instant. Again the Mosquitoes fought. But it was not enough now. The five remaining Germans were desperate, and they had the numbers. They were determined to do their mission or die trying to do it.

The Mosquitoes lunged at them, sliced at them, shrieked at them with gibbering guns. But the Huns were gaining

space. The fight was moving west. And presently Kirby, with his own ship as full of lead as Shorty's and Travis', could glimpse the lighter patch of grounds, the rearing network of buildings and roads, which was Chaumont—G.H.Q. Hell, despite Udermann's death, his remaining *Nachrichtendienst* hounds were still going to triumph!

Kirby waved anew to his comrades. They made a last mad stand. They managed again to hold the Germans back, though they had to take more and more tracers to do it. Kirby's hopes drained. It was only a question of time now.

Dawn began to streak the sky. Still the Mosquitoes fought, side by side, their ships riddled and only holding together by what seemed a miracle to Kirby. And then, suddenly, raising his head in the terrific blast of wind, Kirby saw that Travis was waving commandingly. Kirby caught the signal even though he didn't understand it. Travis was telling his two comrades to zoom, to reach for altitude.

And because Kirby knew the shrewd, elder Mosquito never did anything without good reason, he obeyed—crazy and costly though the thing seemed. The Three Mosquitoes zoomed towards the heights. Below them the five Germans, no longer harried, shot forward like bullets—on for Chaumont.

Kirby watched Travis. When the latter leveled in the gray upper reaches, he and Shorty leveled too. Then again Travis waved. He waved the signal which meant: "Do what you see me do!"

The next instant Kirby gasped aloud. For the lanky Mosquito was flinging a huge oblong thing of metal out of his cockpit. It was the Rodetol-tank—which evidently detached from the fuselage! Travis' propeller had already stopped as the carburetor emptied—his plane was already starting in a glide, motorless—his fuel deliberately thrown out.

But Travis must know what he was doing.

Kirby squirmed in his cockpit while his plane still sliced through miles of space. The gas tank was under the seat, within reach. It was a simple business, a matter of mere seconds. Kirby's motor died; the silence after its shriek seemed deathly. He lifted the gas tank, surprised to find it moist and cold to touch. He hurled it overside. As he glided, he saw that Shorty must have done likewise, was gliding with him.

They overtook Travis by steepening their glides. And Travis was their leader now. He was leading them in a glide for the Hun ships below, the ships which were almost over Chaumont!

Hell, it did seem crazy, Kirby thought.

Throwing out their gas, then making an attack which after a moment would only carry them hopelessly below their enemies. But there was nothing to do about it now. Cursing, Kirby found the synchronizing gear of the machine guns, detached it.

THE three gasless planes moaned down. They swooped once more upon the Jerries from in front, and their de-

tached guns roared, slower now, at regular staccato intervals.

The hail blasted the surprised Germans momentarily back, and again Shorty the marksman scored—sent another down, leaving only four. Those four the Mosquitoes fought off from Chaumont as long as they could keep their gliding ships in shooting position. Then, while Kirby cursed bitterly, the three Yanks were below the others, having lost altitude.

And overhead the four remaining Huns were slicing through the growing dawn for Chaumont. Travis must have been out of his head. His crazy actions had merely made it utterly impossible to stop the Germans at all, had—

Blam! B-llam!

The explosion shattered the sky, over the whine of the Mosquitoes' ships. Wide-eyed, Kirby stared upwards as two of the four Chaumont-headed Hun ships blew to atoms in mid-air! And less than a minute later the other two, in turn, exploded to bits!

The Three Mosquitoes landed safe, though all three could not avoid a crash. They picked the nearest level fields, got rid of their bombs when they saw those fields were deserted, and tried to guide

their ships—which fell with the speed of stones. Finally, their forward speed being too great for safety, they crossed controls, pancaked down. All three crates buckled, breaking on impact.

But out of all three climbed the trio of Yanks whom the gods of war had not yet marked for hell.

"You see," the lanky Travis drawled, as the three sat alone in their cubicle at the 44th's drome, with only a bottle of cognac to augment their number, "when Shorty and I were workers in the plant, I happened to touch one of the tanks—found it was freezing. And when you told me about the gas being turned to a liquid, Kirby, I put two and two together. The way they did it was to freeze the stuff, and kept it in a special container, with ice packed around it. When the ice melted the liquid expanded to gas and ignited while still in the feedlines—that's why the ships exploded. You remember the first time we met them, and that one exploded when we all went into the sun. Well, you can see why now. I figured that if we could stall the Huns their own time-limit would be used up, and their tanks would explode—which they did."

It was perhaps the longest speech

Travis had ever made, and probably it was the cognac which oiled his tongue. Nor was he finished yet. For now, while Shorty sat puffing his pipe, Kirby asked:

"But why did you tell General Saunders, of G-2, that we don't know the truth about Rodetol? We could still give it to the Allies."

Travis smiled. "I think what von Bergsten told you was better, don't you? With the stuff packed in ice, the whole thing is too crude—better to wait for the day when they can freeze it artificially, or find another way to make it a liquid. No, Rodetol is for the future—just as Emil Rodet and von Bergsten dreamed."

Kirby nodded slowly. "You're right. And we'll keep what we know." He picked up his glass. "Let's drink on it. Let's drink to two men who worked and died so that guys like us will some day have real ships to fly! To Emil Rodet—and von Bergsten!"

And gravely the trio drank that toast. The only thing to break the solemn atmosphere which followed was a series of horrible snores arising from one of the cots.

Shorty Carn was sleeping at last.

## Guile of the Griffon

(Continued from page 23)

"No, I don't," Nolbein croaked, his voice breaking down to his booming basso. "But I didn't tell him who yours was for. He thinks I'm crazy! Thinks I don't know what I'm doing. But I fooled him."

"He thinks you're crazy?" sympathized Keen. "You must have fooled him. Who was he?"

"Major Clyde Hartney!" cackled Nolbein. "He doesn't know this one is for you. He thinks I'm crazy. He doesn't know me, does he?"

"I'll say not. Why does he want it?"

"I don't know. Just to fly. My motor got him. He never saw a motor like that before. Sixteen beautiful cylinders. Every one hand-honed in. Eight in opposed rows, delivering 1,000 horsepower—and he thinks I'm crazy."

"Aren't you afraid this Major Clyde Hartney will take your motor apart, study it, re-design it, and sell it to the government?" asked Keen.

"No—I know he won't. He won't have time!" squealed the hunchback.

"Why not? Nothing to stop him, is there? You never patent anything you invent. This would be easy for him."

"He won't," went on Nolbein, with a wild laugh—"because you'll kill him!"

Keen stared at the gargoyle face peering down upon him. "What did you say?" he demanded, spacing his words carefully.

"I said you'll kill him."

"Why should I kill him?" demanded Keen with a scowl. "I'm no murderer."

"Maybe not. But you'll kill Major Clyde Hartney just the same," replied Nolbein.

WITH that, Nolbein clambered down from the cockpit, and Barney reached in for some crutches and slipped them under his arms. Without a word they walked through the cellar corridor and went upstairs into a luxurious living room.

Barney supplied generous drinks. Then Keen went to a wall safe, took out a thick stack of greenbacks, carefully counted them off, and approached Nolbein, who had sunk into a club chair.

"There you are, Nolbein," said Kerry. "Fifty thousand—in hundreds. Satisfactory?"

Nolbein took the wad, smiled enigmatically, and stuffed it into his coat pocket.

Then Keen handed him a second stack of bills, adding, "and that hospital you spoke about. They fixed you up, didn't they? See that they get that hundred grand somehow—anonymous, of course. Understand?"

"I do. By *Gott*, they'll get it, too. You are a strange gentleman, Mr. Keen."

"I'm paying for your silence, too, remember."

"But I say queer words now and then, eh?"

"Damned queer! What did you mean when you said I would kill this Major Clyde Hartney? I never even heard of him."

"No, but you will, and he'll either kill you or you'll kill him."

"When did you deliver that ship, Nolbein?"

"He came for it last night—flew it away himself."

That instant the telephone rang. Barney took up the receiver, then glanced over to Keen.

"For you—It's Lang!" Keen took the receiver.

"This is Lang, Keen," said the voice at the other end. "Where were you all night tonight?"

Keen laughed. "What's the Griffon been up to this time?"

"How did you know?"

"I don't. Whenever you call me at this time of night, I know the Griffon has been up to something."

"Ever hear of a Major Clyde Hartney?"

Keen sucked in his breath and lied, "Major Clyde Hartney? No."

"Well, he's sort of an inventive genius with the Army Air Service. He's working on some secret robot plane out your way."

"Out here on Long Island?" queried Keen, watching Nolbein's face. The little pilot-engineer was laughing fiendishly.

"Yeh. He's got a secret experimental shed somewhere near Montauk Point. He was working on a new robot plane controlled by radio that could be sent off to drop high explosives on distant points. Oh, you know the game. Every big power is working on it, but this guy seems to have something—or did until tonight."

"What do you mean—or did, until tonight?"

"Well, the Griffon's back. He blew in there some time this evening, held up this chap Hartney, and cleared off with the new ship which was equipped with

all the apparatus they want to keep secret. He says it was the Griffon, anyway."

"How interesting. What does it have to do with me?"

"Do with you? For cripes sake, you live within a few miles of his hangar. Do you know anything about it?"

"How could I?"

"Well find out. We want that ship back—and damned quick."

"Look here, Lang," Keen roared back. "I know nothing. I haven't left this place for two days. I never heard of this Hartney, and I'm too busy to bother with work that is rightfully yours."

"There's a lot of money in it, Keen," taunted Lang.

"Well, why don't you go after it. I'm not eager for it."

"You wouldn't be. Any guy who can give fifty grand to a crippled children's hospital and twenty-five thousand to a blind institution wouldn't need it. Listen, brother, if you don't help find out what happened to that ship, I'll start looking into your income-tax returns."

"I never had any such money," lied Keen.

"Well, how did those institutions get it? I'll tell you. Remember that place in Jersey where they train police dogs to lead the blind? Well, the blind guy you picked on to take that package of dough wasn't blind at all. He was just a trainer going through the motions. He saw you, recognized your photo. We worked from that, and there you are."

Kerry Keen had gone white. He said nothing for a moment. He was watching Hans Nolbein, who sat leering.

"I told you, you'd have to kill Major Clyde Hartney," chortled the cripple.

Keen swore under his breath.

"Okay, Lang," he muttered, "you're mistaken, but I'll see what I can do."

"When will that ship be back in the Montauk hangar?" prodded Lang.

"Judas! Give me time, will you? I don't know what it's all about yet."

"Midnight tomorrow, would be okay, Keen," Lang taunted.

Keen hung up with a bang.

"Where did Hartney take that ship you sold him, Nolbein?" demanded Keen.

"I don't know. I only know that he came to Wooden Ball Island twice. Once to order, and once to take delivery."

Keen turned to Barney. "Where's this hangar at Montauk, Barney? You ought to know. You're always wandering around—just when I want you here."

"I know where it is. Stands back from the light about a quarter mile. Used to be a boat-building shed. Now they've got a heavy, high-wire fence around the place. But you could get in."

"Right! Let's go. We'll take Nolbein back to his place and then. . ."

"Then you can come back and kill Major Clyde Hartney," Nolbein laughed tunelessly.

kept the muffler cut in, and Keen took the pilot's seat. Nolbein sat behind and explained briefly a few of the new features he had incorporated in the ship. Barney closed the garden doors while Keen eased the plane down the concrete ramp. Then Barney clambered in and squeezed himself into the space behind the rear cockpit.

They took off easily with flaps down. Once they were well clear of the water, Keen cut the Skoda mufflers out and the great opposed motor let out a gigantic roar as the amphibian hurtled to a speed of 250 miles per hour.

"Now try the retracting gear," grunted Nolbein, as Keen headed her up the coast in a northeasterly direction. "That long switch there."

Keen moved the black handle over and a small motor began to grind. He noted the air speed needle eased up another twenty miles as the pontoon gear was raised and drawn into two long hollow slots moulded into the whale-like body. A red light beamed above the black switch—warning that the pontoons were up and the pilot must lower them before attempting a landing.

"See?" beamed the little German. "And if your electric gear does not work, you can raise or lower the pontoons manually with this crank. You fit it on that bar under the instrument board."

"Perfect!" commended Keen.

About an hour later, the black amphibian dropped down with muted power and sought the little cove that snuggled into Wooden Ball Island. This tiny chunk of rock lay twenty-five miles off the coast of Maine, opposite Rockland and was only two miles in length and less than half that wide. Here Hans Nolbein turned out high-speed planes, sans government license or supervision, for those who could afford to pay for them. Keen had become acquainted with him through his many charity forays.

It was an unusual story. Nolbein, a former German ace, had attempted to set himself up as a manufacturer and designer in America, but his ideas and designs were considered impractical by the authorities. Worse yet, certain unscrupulous engineers blocked his chances of getting government patronage. The climax had come when he attempted to display a new single-seater fighter before Army Air Service officials. Something was "slipped over"—sabotage—and Hans Nolbein was carried from a grim pile of wreckage with no chance for life. However, a little-known surgeon of the old school had, taken him into his small private hospital, and after months of skilled care, Nolbein was snatched from the grave, a horribly distorted semblance of his former self but alive and able to continue his profession. The most remarkable feature of his recovery was the fact that what he lost in physical powers seemed to have been more than compensated by his amazing mentality. Long months of suffering, innumerable operations, and the siege of pain and fever seemed to have whetted his mind to an amazing

keenness and new ideas and improvements skimmed from his pencil-point.

It was then that Kerry Keen discovered him and paid his hospital expenses. In return, Hans Nolbein had agreed to build his benefactor the finest ship money or skill could obtain.

THEY dropped into the little cove that lay like a black velvet mantle off the rugged shoulders of Wooden Ball Island. Keen ran up to the planked ramp and helped Nolbein clamber down.

There was a weird tenseness in the air that caused Keen to look up. Nolbein was just ramming his crutches under his arms when the shock came.

A low growl, a steely hissing, and out of the sky swept a strange biplane with a projectile body.

"Say!" gasped Keen. "What's that?"

Barney was taking no chances. He moved up into the gun compartment, ripped a double pair of Colt-Brownings out of the shelter cubby, and opened fire at once. The strange ship came on. A blue light suddenly flashed from the biplane's cockpit and she jerked perceptibly.

Then there was a dull thud. Flame flashed up, and for an indescribable second the outline of Hans Nolbein's shed and cabin stood out in gaunt silhouette. Then, like an insane shadow-graph, it all disappeared in a blotched nothingness. Ba-ar-oom!

A bomb had landed with weird accuracy, directly in the middle of the little island factory. A shower of debris pattered down about them and pinged off the dural sheeting of the amphibian's wings. Barney pounded away at the black and white biplane. Nolbein turned to Keen with a stare of frustration.

"Go get that devil!" he screamed through the tusked design of his shapeless mouth. "Get that swine! He has destroyed everything I have."

Keen shouted over the side, ran the amphibian further up the ramp, and barked out at Barney. The Irishman leaped out, grabbed a wing-tip, and turned the ship around. Then, while Nolbein exhorted them with screams, Barney leaped back in and they rolled down the planked ramp.

Into the water, then, with everything the throttle had, Keen slashed the dural pontoons through the water, hoiked her up on her step, and gradually took her off. They climbed madly. Barney was trying to find the mysterious ship with the aid of night-glasses. Once he caught a glimpse of the tongues of flame streaking from the biplane's exhausts, but when they tried to catch up, the black and white craft disappeared.

"What now?" demanded Barney when they eased down and set their course back for Long Island.

"We'll go back. I guess old Nolbein was right, after all. We will have to see that Major Clyde Hartney is—removed. He certainly is mixed up in this mess. You know what that was, don't you?" he continued. "It's a robot plane—flown by remote control. There was no pilot in that ship. I could see that when the circuit breaker flashed inside and released the bomb."

FOR the second time that night, the mysterious door under the rock-garden opened. The black amphibian was rotated on the turn-table, then the big Nolbein motor was started. They

THE hangar behind Montauk was the scene of much activity about an hour later, even though it was well on toward 3 o'clock in the morning. At the front end was a well-furnished office that looked out across the sparse grass and sand that ran down to the waters of the Sound. It boasted two wide desks, a large drawing board, several files, and a great safe.

At one of the desks sat a medium-sized man in khaki uniform. He was a colorless individual, except for his deep-set, piercing eyes. He was speaking into a telephone.

"Then you are certain that she scored," he was saying.

"Positive. The seismograph attachment records the explosion with accuracy. The barograph shows the actual height course, and the explosion graph corresponds perfectly with the lowest point of the dive."

"Everything else check?" demanded the man in khaki. "We can't risk anything further on that old devil."

"Well, there's one thing I can't make out at all and it has me worried. The damn thing came back full of bullet holes!"

"What?" gasped Major Clyde Hartney.

"A fact. Two bad bursts in the tail assembly and another through the body just behind the robot-pilot mechanism. Another foot, and she'd never have returned."

"Any idea where that happened?"

"Hard to say. The recorder shows that one burst must have hit her a few seconds before I released the bomb. They show in jerky lines on the tape just before the recording of the bomb explosion. The second burst hit her a few seconds after the bomb exploded."

"Then that means that someone fired at that ship when she was actually diving on old Nolbein's place. Where did they come from?"

"Apparently from the ground."

"Then she was not attacked from the air."

"I wouldn't say so, considering the angle from which the bullets entered. But we've got to be very careful. Nolbein may be dead. He should be if he was still in that shed. I figure we made a direct hit and there will be no chance of his getting the other ship out."

"We don't know, of course, whether it was still in there or not. He said he was using it himself. But somehow I don't believe that."

"Well, I'm hoping that it was. It will make things a lot easier for us. Anything on Groener?"

"They'll be ready for delivery at midnight tomorrow. You'll have to fix her up by then. Can you do it?"

"Certainly. No real structural damage. A few new dural sheets and she'll be as good as new. I'll pick you up as arranged."

"Fine! We've got to work fast now, Monkton."

Major Hartney put the receiver down on its base and looked up into the blue-black muzzle of a grim automatic. It was held by a man in a tight-fitting coverall whose face was completely cov-

ered with a scarlet mask.

FOR an instant Major Hartney sat spellbound, then he snatched at the telephone receiver again.

"Never mind," said the man in the scarlet mask in a tone that was in every sense an order. "Keep your hands off that—and everything else on that desk."

There was a quiet, but strong, severity in the voice.

Hartney raised his hands slowly and the blood seemed to drain from his face as his long delicate fingers stretched upward. He peered through his upraised arms like a felon staring through the bars of a cell.

"What do you want?" he finally said in a husky voice. "Do you realize that you are trespassing on government property?"

"If I'm trespassing on government property," stabbed the masked man with a hint of a chuckle in his voice. "What are you doing here? Actually," he added, "you're engaging in a gigantic theft."

"What are you talking about?" demanded Hartney.

"Don't stall. I don't have much time to waste on you, Hartney." Then the man in the scarlet mask slipped his fingers into a small pocket set in the waistband of his coverall. He drew out a small white card and flipped it across the table with a dexterous movement. It fell face up before the man seated with his hands up. His eyes turned slowly down from the gun and focussed themselves on the card in front of him.

"The Griffon!" he gasped. Then—"The robot plane? What did you do with it?"

For a moment the man who had tossed the card relaxed his grip on the blue-black gun. His body lost its tenseness as a wave of humor and admiration swept through him.

"I've got to hand it to you, Hartney," he replied after a short pause. "You certainly are a grand actor. You missed your calling."

Hartney raised his eyes from the card again and frowned at the man before him.

"Don't try to carry it any further, Hartney," warned the man in the mask. "You may be able to fool the boys in Washington, but you are not slipping it over on me. You see, I'm the real Griffon, and the lad who took the robot plane was someone working with you who happens to be flying a ship exactly like mine."

Hartney let out a viperish hiss.

"We can save a lot of time and trouble, Major," the man in the Mask went on, "if you tell me where that robot plane is."

"I don't know. I tell you a man who calls himself 'the Griffon' stole it."

"Liar! I know for a fact that you are in touch with someone who has that plane and who plans to hand it over to someone by the name of Groener. You see, I overheard most of your telephone conversation. Your little game is finished, Hartney."

"And now you want the robot plane—

the plane I developed after years of hard work."

"Perhaps, Hartney, but now that it is finished and ready for actual service, you intend to sell the device to some foreign power and pick up a lot of money, eh? But it's not going to work this time."

"Any chance of working this thing out?" asked Hartney with a leer.

"There might be. How much have you been paid so far?"

"Two hundred thousand dollars. I get the rest when—when the plane is delivered. What will you take to clear out?"

"Where's the two hundred thousand?" demanded the man in the scarlet mask.

"See that fuse box over there on the wall?" said Hartney, directing his eyes across the room to where a black enameled box was screwed. "It's in there. I didn't leave it around handy for the boys to find when they made their search after the ship disappeared. Go over and pull the lid down. It's all there—in hundreds."

The Griffon shifted his gaze to the box and noted that it carried armored cable through the round insulators. He studied it carefully a minute and smiled.

"You go over and get it out, Hartney," he finally said with a shrug of his shoulders.

"I'll have to pull the switch down, you know, to open it," Hartney replied with a smile.

"I've noticed that," the Griffon smiled. "That's why I wanted you to open it. Don't worry, you'll be well covered."

Hartney's hands began to drop. So did his jaw.

"You—you get it. I feel too shaky, Griffon. This experience has upset me badly. You open it. I'll play the game."

"Sure you will. You're game, Hartney. I'm taking no chances on that box. Go over and get that money."

The air in the small office was tense. Both men were watching each other like crouched panthers. The Griffon's gun moved closer to Hartney's chest.

"Go and open that box, Hartney!"

The man in the major's uniform slowly got to his feet. He stared across at the box, then back at the Griffon. His face was like dried putty and his eyes blazed an insane fire. He turned and stared at the door, a hint of a smile at one corner of his mouth.

"All right," he finally muttered. "You go over and stand in front of the door. Leave it open, so that nothing can happen—so that I can't rush out when the light goes out."

The Griffon glanced at the box, then at the door. The box faced the door exactly. He nodded, backed toward the door, and with left hand behind him turned the knob. He drew the door open and stood in the doorway. He smiled as he measured the height of the conduit box opposite. His victim could not see that smile.

Hartney moved over slowly, watching the Griffon carefully. He glanced around the room, as if seeking something, then, with a final glance, moved

over in front of the box. His hand reached up for the black metal switch that protruded out of the right-hand side of the box. The Griffon watched him carefully, his gun waist high.

"Go on, pull it!" the Griffon ordered. "What are you waiting for?"

"I—I don't want to get a shock. There's a lot of juice in these wires. I'll move over to the other side."

He started to cross over in front of the box, his fingers still hooked around the black handle. Then the Griffon moved swiftly to the iron safe. His gun barked with a crack, and a bullet smashed into the beaverboard above the box.

Hartney jerked and something exploded with a low roar. The Major let out a low cry, spun around, and dropped to the floor, a mangled figure. A small looking object glinted from the opening in the box.

"Just as I figured, Hartney," the Griffon said. "That was not a regular fuse box, and you reacted just as I thought you would when I fired that shot. You jerked away, pulled the switch lever, and worked the treacherous mechanism that fired that hidden gun. A natty idea, but you should not have left the real fuse box in view. You might have moved the safe over another foot and covered it."

Then with a quick movement he darted to Hartney's desk and ripped open a drawer. It contained nothing of interest. He tried a second and a third and finally came upon what he was looking for—a small first-aid kit box. He ripped open the lid and smiled under his mask. It was stuffed with neatly packed bills. With a quick movement he switched off the lights and hurried to the door.

**SILENTLY** the man in the mask slipped into the shadows outside the big hangar and listened. Ahead the great light of Montauk was sending out its long beam and guiding mariners out on the Atlantic.

Footsteps could be heard faintly and an auto horn squawked in the distance. He ran like a quarter-miler across the smooth sand-packed ground toward the silver-laced water that gleamed ahead. He could see the outline of a black amphibian curling around from the north and heading for the stretch of beach that swept northeast from Culloden Point. A shot rang out from the blackness behind him and he ran on under cover. The silent amphibian came down hissing like a giant drone and kissed the easy rollers with her racing pontoons. Then, as soon as was possible, the pilot applied rudder, slewed around, and came to a shuddering halt not ten yards from the water's edge.

The Griffon ran again after giving the ship a quick glance. Then, like a white wraith, he charged into the water, yanked at the tail of the amphibian, and spun her around until her nose faced the open water again. He struggled up on the pontoon, gripped the leather-covered combing at the rear portion of the pit, slipped down under

# Advertiser's CONTACT

A LITTLE NEWSPAPER DEVOTED TO A BIG CAUSE ★ OF, BY AND FOR FLYING ACES CLUB!

VOLUME 16

NOVEMBER, 1935

WHOLE NUMBER 27

## Flying Aces Now the Greatest Aviation Magazine Published

**W**ITH this November issue, **FLYING ACES** thunders along with the blue ribbon of the Airways proudly flying from her wings! **FLYING ACES** challenges the field of aeronautic publications! Not only is our magazine three publications in one—**A MODEL BUILDING MAGAZINE—AN AVIATION FACT MAGAZINE—AN AVIATION FICTION MAGAZINE**—all bound up in one cover, but the book is 20% larger with the addition of 16 more pages, and now we not only boast that **FLYING ACES** is the biggest aviation magazine to ever sell at 15c, but we feel sure that you will find **FLYING ACES** has the **LARGEST MODEL BUILDING DEPARTMENT** of any aeronautic magazine published!

Readers, after all is said and done, we have You, and You, and You to thank for making possible this tremendous stride. During the past year we have noticed a steady increase in club membership, and in this respect you'll recall that recently "Doug" Allen reported that the 50,000 mark had been reached. This of course was the direct result of "reader recommendation." **FLYING ACES** readers do not believe in keeping good things under their hats—they spread 'em around, and with Flight after Flight and Squadron after Squadron being added to the club, additional **FLYING ACES** magazines had to be published.

Then there's the advertising angle: Not a day passes but that we receive at least several letters from manufacturers advising that they have received communications from F.A.C. members to the effect that they should advertise in the official club magazine. Moreover, these members have not gone to this trouble solely because they hope to win club awards, but because they always have realized that the more advertisers we had the more money we'd have to

spend in giving them a **GREATER FLYING ACES**.

And so, with the advent of this great November number, our engine power has been increased by 20 per cent and from present indications during this Fall and Winter we're going to roar on to the greatest circulation altitude ever attained by a publication in our field. In this connection, old **ACES UP** wishes to call your attention to page 90 announcing the formation of the **FLYING ACES PRIZE CLUB**.

You can take my word for it, "Doug" Allen is so enthusiastic that he can't sleep nights, for he's all for giving you readers and members of the F.A.C. the best prizes obtainable, and what prizes! Gosh, for just a few subscriptions you can get a genuine **STEWART - WARNER SPEEDOMETER** for your bike; a "wow" of a football; a tool chest that can't be beat, and you "G-2" members can get a peach of a **FINGER PRINT**



While on the subject of promoting **FLYING ACES**, we wish to introduce Bob Thompson of Toledo, Ohio. Bob is the champion window dresser of the F.A.C. although Bob Martin, Milford, Utah, runs him a close second. Both, you will recall, recently won Bronze Props for their fine work.

**OUTFIT**—the same type used by Police Departments and Federal authorities.

Come on, readers, let's all put our shoulders to the wheel and with one mighty shove get our new and greater **FLYING ACES** off to the good start it deserves. The youth of our country is aviation conscious, a great proportion is **FLYING ACES** conscious, and it's up to us to talk up **FLYING ACES** to those who don't know what they're missing!

### In the Market for a Saw?

**E**LSEWHERE in this issue is an advertisement for the **SCROLL SAW**—a special balsa cutting unit, which, according to the manufacturers, will enable model builders to turn out cleaner looking models in one quarter the time now required for their construction.

The **SCROLL SAW** is an economical instrument all the way through. Its initial cost is low and it can be operated by hand or by a small motor. It can be firmly bolted into place on the work-bench, permitting the free use of both hands. The detachable blade represents one of its most interesting features—it uses only one-third of the regular blade—thus, three blades for one.

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the open window cowl, and yelled: "Let her go, Barney!"

The amphibian jerked and strained as the great motor opened up and hauled the weight up onto the step. Then she began to stream away and hustle for height.

"Nice timing, Barney," the Griffon remarked as he leaned over to squeeze the water out of his coverall and trousers below his knees.

There was no answer from up front.

"It took a few seconds longer than I figured," the Griffon went on. "But I got the light out eventually. You must have started down at once, eh?"

No answer from up front.

The Griffon looked up quizzically and studied the man in front of him. He was much taller than Barney. He wore white coveralls, a white linen helmet, and under it a *scarlet mask!*

Keen gasped.

Now the man was peering at him over his shoulder as he skillfully climbed the black amphibian. His eyes gleamed with a leer of triumph.

"So—Mr. Griffon," sneered the man in front. "I have caught you. What were *you* doing down there on that Government field?"

Keen sat back in his seat. His hand was on the butt of his big automatic. His mind was racing at tremendous speed.

Where was Barney and *his* black amphibian? Who was this man up front? Groener or the man named Monkton to whom Hartney had talked over the telephone? Where was he being taken?

"I never expected I would ever be able to take you for a ride," the man taunted. Still Keen held his tongue. His silence, he knew, would soon get under the other man's skin.

"Well, say something. What's the matter, scared?"

Then as if he had suddenly remembered something he turned around further in his seat, still keeping the muffler in so that they could talk.

Keen half-smiled at the man through his goggles, but did not answer.

"Did you get Hartney, you swine?" he half screamed, letting the ship slip off a trifle.

No answer.

"Come on. There's no use trying to bluff me. You're licked. I'm the boss this time, Mister Griffon. Where's Hartney?"

In reply there came a low taunting laugh. The pilot up front tried to figure it all out.

"So you think you have me," laughed Keen. "You are easy. In the first place, your friend, the Major, has done off with your two hundred grand. Next, he plans to get to Star Island, get the robot plane off to Groener on his own, collect the rest, and leave you to face the music. Now what are you going to do—head for Star Island?"

For an instant the man up front sat stiff, letting the amphibian veer off, but finally he turned back to his controls, steadied her, and went over a northeasterly course. Keen watched the compass card slide around and display the course figures. He smiled, for he

knew that his wild stab had been reasonably correct.

"How do you know all this?" demanded the pilot in the strange make-up.

"Easy! I arrived just too late to stop him. But he left certain papers and scribbled notes on his memorandum block—notes jotted down after talking to someone on the phone. It was easy to figure out the rest."

Now it was the pilot's turn to lapse into taunting silence.

But Keen kept jabbing away: "You'd better hurry up to Star Island and head Hartney off."

Suddenly the man up front turned and glared at Keen. Then he smiled cruelly: "You are making a wild stab, Griffon. I don't believe a word you say. If this is all true, why did you climb into *my* ship, and how did Hartney expect to get to Star Island? Answer those two questions."

"Simple. I mistook this machine for my own, which was supposed to be there. I don't know what happened to my man, but I can guess now. You see Hartney went up to Star Island in a plane flown by Hans Nolbein. There's your whole trouble—Hans Nolbein."

"Liar! Hans Nolbein was killed in an explosion at his shack tonight. I saw to that."

"Fool! Hans Nolbein was not even in his shack, as you call it. He was flying with me and we are the ones who put those bullets you were so puzzled about into that robot plane."

"From the air?" snapped the man up front.

"No. From the water. We had just landed."

"Then how did Nolbein get back to Montauk so quick? Answer that one!"

"I can't," replied Keen with a queer smile. "He must have had another ship of some sort."

The pilot turned back to his controls and headed further away from the rugged Massachusetts coastline. He was trying to figure it all out. But he had no intention of allowing Keen to dive overboard and take to the silk—not just yet.

**T**HEY flew on in tense silence for a time, and the pilot kept his mufflers in to make certain he could catch every move his passenger made. It was a ticklish situation. He knew Keen could kill him and take over with little trouble, but he also sensed that he was making a wild effort to find out something else. Then, if Hartney had cleared off with the money and the robot ship, his fate was settled already. His only hope now, was to get out of the country and lie low for some time. The wilds of Canada seemed to be his only salvation.

"Well, what's your best offer?" he finally turned and asked.

"Where's that robot plane?" demanded Keen.

"Oh, so you don't know where it is, eh?" chuckled the man up front. "Well, now, that's different. That means I can do the talking."

"You can talk, all right, but you'll

have to say the right things," taunted Keen. "I want that ship. Where is it, at Star Island?"

"Well, since you are so sure that Hartney has pulled out, I can't say where it is. It might have been at Star Island once."

"Okay, then. I suppose I'll have to kill you and get rid of your weight."

"Then what? You'll be no closer than you were before."

"Oh yes I will. I'll nail Groener before he gets hold of it."

"Fine. And how will you do that? You don't even know who Groener is or where he might be. You're not that smart, Griffon."

"I was smart enough to find out where the robot plane was being handled from, eh?"

"Perhaps so. And I guess there's only one thing for me to do," said the pilot.

"What's that?"

"Contact Groener, pick off Hartney, and get my share."

For a moment, Keen was stumped. Then he nodded, smiled to himself. "All right," he said. "Go to Groener. I'll go with you and get the whole lot of you."

The man up front laughed loud, cut out the mufflers, and headed the ship out toward the open sea. Then, while Keen settled back to think over his plans, something happened that broke up everything.

From above them slammed a streak of fire. The black amphibian jerked and bucked like a stallion. Again slim pencil-like tracers forked at them and the man up front shouted.

"Take that gun out and go to work!"

Keen turned and saw a black object hurtling down at them, pouring bursts as it came. The pilot of Keen's ship darted the amphibian back and forth and tried to get its nose around, but as he twisted in his seat, something crashed into the glass above his head. He let out a loud cry and fell over the stick.

Down went the black amphibian like a comet. Keen quickly fired three short bursts from the gun—bursts which streaked well clear of the onrushing mystery ship and seemed to speak in a dot-and-dash system. Then he scrambled over, yanked the dead man off the controls, and saw that his face had been literally blasted away with explosive bullets. Keen hurled the dead man clear and got at the controls. But it had all taken seconds, and by the time he was fully in position, the water below was dangerously close. He heaved back gently on the stick, but it snapped indicating that the elevator control had been blasted out. He shut off the motor, kicked the rudder, and ramméd the stick over into the side.

"A spin," he muttered grimly, hits only one seventh as hard as a straight dive."

The black amphibian spun. He forced her into a wider and wider arc and steadied himself for the smash. Then there was a wrenching crash and the ship floundered in the water like a harpooned whale. Keen covered his face

(Continued on page 78)

# Flying Aces Stamp Tales

A MONTHLY AIR JOURNEY VIA STAMPS  
PILOTED BY CHARLES CORWIN, A.P.S.

**A** LOT of us may remain aviation kiwis; but in our interest and enjoyment of beautiful stamps, we can hop off on many philatelic flights with happy three point landings in foreign fields.

This month, let's consider the evolution of aviation. We quickly find that the whole history of man's emulation of the eagle has been pictured on stamps, and so many such stamps are available that wide selections are offered. We may take our choice—and that's half the fun, since it gives each collector a chance to exercise his own judgment and to indulge in his own pet theories as to what incidents pictured are most significant. On this page, we picture a few stamps that should be included in a specialized collection depicting aviation history.

First, we have the "Osterreich 30g" in which an eastbound plane is passing a westbound crane en route. This is a



Upper left: Belgium. Right and below: Russia

nautical experimentation. He was subsequently killed in a glider accident—the high flying crane had not fully disclosed the secret of its flying ability.

Next, note the queer "Correo Aereo Espana" to the left of the Austrian stamp. Here we have five wild-looking contraptions, the brain children of the artist Goya. Senor Francisco Goya y Lucientes evidently got his idea from the study of bats, since this quintet of primitive flyers certainly looks "batty," with wings strapped to their bodies and guys and cross wires braced from wing tips to their feet. But we must not be too hard on the artist, for he died back in 1828. Who of us would dare prophesy with pen or paint the aviation of a century hence.

Now, we fly northward from romantic Spain to Denmark. What have we here: "Danmark Luft Post 10 ore." Many of us can remember when Model T automobiles scared old Dobbin on the highways and byways. Well, this

(Continued on page 96)

**NEXT MONTH: MYTHS ON AIR MAIL STAMPS**



Egypt

particularly happy combination on an Austrian air mail stamp, for Otto Lilienthal, of nearby Germany, used to watch the flights of cranes as they passed over his native land bound for Lapland or Africa. Herr Lilienthal studied the birds in flight and decided that the ratio of their wing surface to their weight was of real value to aero-



Spain

Austria

Denmark

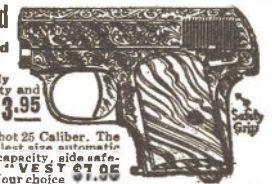
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## Guile of the Griffon

(Continued from page 76)

with his arms and was hurled with a spinning jerk into the instrument board. Recovering a moment later from the stunning blow he clambered out of the battered cowl frame and made for the tail that stuck from the water.

Almost at the same instant, the other black amphibian landed nearby and eased up alongside, and Barney O'Dare leaned out, a black automatic resting on the combing.

"Put the artillery away, Barney," cried Keen. "I'll be with you in a minute."

He slipped along the body again, took out several cards from his coverall pocket, and made his way to a broken window where he could see the body of the man in white coveralls. He slipped the cards into the pocket of the dead man, then reached in further and snatched the maps off the board. In another minute he was crawling up the pontoon struts of the other ship.

"Bashing Barney the Boy Blunderer," chuckled Keen. "You always turn up at the wrong time."

"You mean you always take the wrong ship," growled the Mick. "What the devil happened to you, anyway?"

"It's a long story, Barney. Get off and head for Star Island, just off the New Hampshire coast. It's one of those in the Isles of Shoals. South of Smuttynose."

"Glory! First Wooden Ball Island, now Smuttynose! What is this? A cross-word puzzle addict's geography?"

"Get going, while I look over this chart of the Griffon's," gagged Keen.

"The Griffon's?—Who was that guy?" demanded Barney.

"The Griffon!" replied Keen, in a determined voice.

**B**ARNEY headed the amphibian well clear of the beam of Chatham light that shone from the headland on the tip of Cape Cod, checking his position with the radio signals that came from the Navy compass-checking station at the base of the big lighthouse. Then, while Keen studied his chart with rare care, Barney turned north-west and shot for the comparatively short length of New Hampshire coastline and for the short string of almost barren islands lying in the sea about nine miles beyond—those islands, so battered and miserable in their plight, that few have ever found even the most meagre livelihood upon them. There are three main islands of the string, namely Appledore, about a square mile in area; Smuttynose, a narrow spiteful block of rock and sand; and finally Star Island, which lies about two miles further south, and which by some strained sense of imagination might be termed star-shaped.

It was this latter bleak, untenanted chunk of rock that Kerry Keen had seen marked on a small map in Major Hartney's desk drawer. The same small island was also marked by criss-cross

lines on the map yanked out of the clips of the amphibian that had just been wrecked. Whatever the man who had masqueraded as the Griffon had said about it, it was evident now that Star Island held some evidence concerning the missing robot plane.

Barney eased back and took a sight on Rockport and Cape Arin. Then he cut the mufflers in and leaned back to where Keen was still studying the dank chart under a small light from the radio panel.

"Well," he remarked over his shoulder. "We're only a few miles away. What's the menu?"

"Jerked shrouds, soused trousers, sizzling action, and Heaven knows what," Keen answered without looking up. He was working out something with the aid of figures on the back of a message pad.

"Well, the place is now only a few miles away."

"Okay. Strip the decks for action, Barney. Be ready to change seats any minute—or make a landing."

They still had the mufflers cut in and the big speedy amphibian was racing toward the small group of islands that lay like stepping stones out from the New Hampshire coastline. Barney circled wide, and Keen, who was studying the island with his night glasses, discovered only one dim light. It came from a smudged building that nestled between a great rocky pile and a sand dune. From the building ran what appeared to be a boarded walk, but the shadows and the low visibility of the night made it difficult to make out exactly what it was.

Keen tapped Barney on the shoulder and pointed down. "See that cove off to the right of that light?" he asked. "The water is fairly deep in there, Barney, according to the chart. Get her in there quietly. We'll have to land well out and swim in. That's our best bet.

**T**HE black amphibian dropped down on the inky waters like a saffron ghost. Barney brought her in with plenty of headway and kept her well inside the shelter of the cove. Then he let her drift toward the side closest to the light Keen had spotted.

"I'm soaked now, and a little more won't do me any harm," muttered Kerry, clambering quietly out and getting on the wing. "Give me that line."

Barney handed over a coil of hemp rope. Keen fastened it to one of the pontoon struts and dropped into the water. Then he swam with the rope slowly dragging the amphibian after him. As soon as his feet touched, he stopped, and Barney threw over a light anchor. The ship was soon steady and floating clear. Barney dropped onto Keen's shoulders and was carried through the water to the sandy shore.

"Whatever you do, don't get your feet wet," growled Keen.

"Don't intend to. I wunst knew a man

who died from too much sea water," commented Barney casually. "Now if we had a drink—"

"You'll get one—when, and if, we get back."

"I don't like that 'when and if' business."

"Shut up! There's one hundred twenty-nine distilleries in Ireland and Scotland, at the last returns, still turning out plenty of stuff. You'll do well enough."

They collected themselves, checked their weapons, and wrung a few more quarts out of Keen's clothing. Then they clambered on up the rocks and peered over the other side. They could now see the wooden building plainly. It might have been anything from a net-drying shed to a rambling summer bungalow, from what they could see. They found a narrow path down the rocks, but Keen ordered Barney to step aside with him and follow it a few feet clear of the level track. He was taking no chances on booby-traps.

It took several minutes to get within inspection distance of the place without tripping over wires that had been set to catch unwary feet and set numerous tin cans jangling to warn the occupants.

"Reminds me of the old Jerry bait lines they used to lay out in the advanced sap communication trenches," mused Barney. "I'll bet someone put these in who had Western Front experience. I wonder—"

Keen plucked at his arm.

They stopped, for they could hear a voice—the voice of a man talking over the telephone. Keen stared up at the sky and peered all around.

"No wires about here," he observed quietly.

"Probably brought in by undersea cable. But listen, that voice is somewhat familiar," offered Barney.

Keen frowned, and stared at the Irishman. They exchanged knowing glances and gripped the butts of their guns.

They moved forward carefully and continued to listen. The voice rambled on in varied cadences.

"I'll be dommed!" gasped Barney.

"I can't believe it," husked Keen.

They advanced again then Barney suddenly leaped sideways as a huge body suddenly fell upon him. There was a low scuffle, and Barney went down struggling.

Keen darted in and found his man holding the snout of a giant mastiff. The animal was frantically attempting to get free, but the little Irishman held on and his eyes gave Keen a knowing signal. In a flash, Keen ripped out a small tin box, selected a little bottle, and poured some of its contents on his handkerchief. With a quick move, he rammed it over the dog's nose and held it there while Barney turned away to evade the overpowering fumes. In a few seconds the big animal went limp.



"Hate to do that, old boy," muttered Keen, "but you'd rather upset the apple cart just now. You'll feel better in an hour or so. Nice work, Barney. A double-hooker for that—"

"Whin and if," commented the panting Barney.

They arose, listened again, then moved like shadows toward the screened window. Together they peered over the edge of the window sill.

At a small efficient-looking radio telephone panel, sat Hans Nolbein!

**K**EEN and Barney exchanged glances.

"So that's why he sold that other ship," whispered Barney.

"Nice little game to get either me or Major Hartney out of the way, eh Barney?"

"An thot other jimbo tried to get Nolbein. A nice little kittle o' fish!"

"Listen. He's still talking to someone."

"... but I think it will be safer," Nolbein was saying in his cracked voice, "to dismantle it and get it out to you somehow."

Keen was staring at a black box that stood at one end of the room facing a bay-window that looked out on the sea. It was about eighteen inches square at the base and nearly four feet high. At the top were several dials, such as were used on radio sets in the early days. A heavy cable ran into the box from one side, and a series of taped wires ran out the other and seemed to go through a conduit under the window.

Nolbein continued after a short pause: "I don't think it would be so risky—I'm sorry we are so late, but Monkton and Hartney got into an argument and slowed things up a lot."

"Quite an argument," agreed Keen quietly. "Both dead!"

"Where are you now? Can you have your wicker trail platform ready within an hour?"

Keen hissed.

Nolbein was fumbling with a pencil and making a move to jot something down.

"Forty-three, ten, north by sixty-eight, forty. Let's see, you are about one hundred miles, roughly speaking, east of Portsmouth. Right?"

Keen jotted the numbers down on his pocket pad.

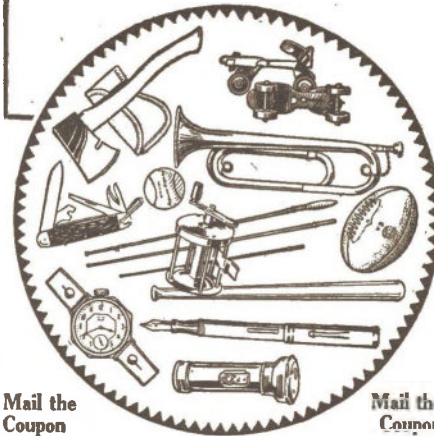
Nolbein went on in his excited cackle: "She does about 126 top with the motor we have in it now. That would mean it would be about an hour or so before she could get there. Give me your course. I'll set her, and you can take over and bring her in on the trail net with your control box. How will that be?"

"You'd better start moving. It will soon be daylight," warned the Mick.

"You're right. I'd forgotten all about the time. But listen!"

"... I want the money in American bills, remember," Nolbein was saying. "All right, you put it over the side in a can on a raft. I'll get it as soon as it is light... The blue-prints?... I have them right here. Yes, I'll post them to you through a Montreal office."

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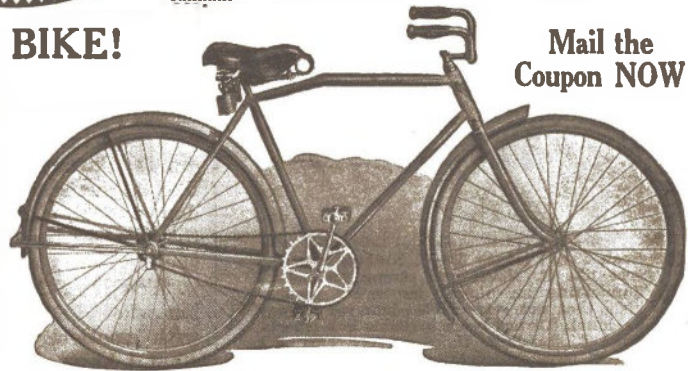


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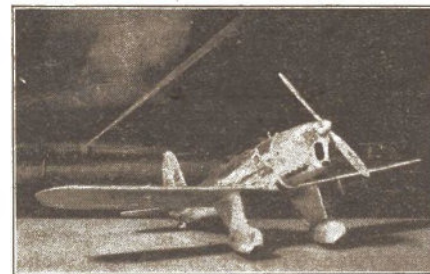
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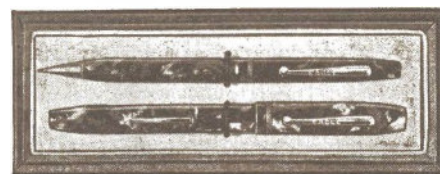
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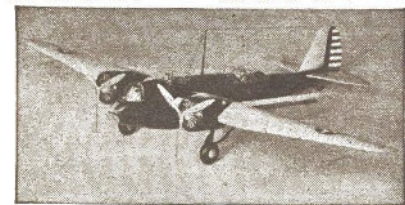
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"Come on," snapped Keen, "he's up to something!"

Barney stood back and heaved a punch at the screen in the window. It went in with a crash and Nolbein turned like a man shot. Then he screamed back into the radio-telephone receiver: "Gott! . . . Here she comes! Take her!"

Then, while Keen clambered through the window, the little crippled inventor crabbed across the floor, hurled himself bodily at the black control box. Then, with an ear-splitting screech, he jerked a lever before Keen knew what was going on.

"Stop him!" roared Barney, thundering across the room.

But Keen had been too late, and now there came the roar of an aircraft motor that had opened up somewhere outside. Keen tried to regain his bearings. "What's that?" he bellowed.

The three men made a grotesque picture in the big room. The insane Nolbein with a crazy expression of triumph across his face; Keen standing puzzled and uncertain, the big automatic in his hands; Barney, running back and forth like a gnome, peering out of the window snatching at maps, and charts. But the tuneless laugh of Nolbein broke the spell.

"Too late, Mister Keen," he raved, his whole body jerking and twitching with emotion. "Too late. You did just what I knew you would do. You killed Major Clyde Hartney—but I got the robot plane. He thought I was crazy and so did Monkton. They both tried to do me out of my reward, but I fooled 'em both—and I'm fooling you. Listen!"

The aircraft motor still roared. Then there was a prolonged hiss, followed by a bellow of released power.

"He let her go," screeched Barney. "I told you he'd do it!"

Keen stood poised in the center of the room. Then he darted past Nolbein and stared out of the windows. His eyes caught the gleaming rails of a ground catapult. The cradle was still trembling against the buffers. And out in the distance gleamed the tell-tale exhaust penons of an aircraft motor, set between the trim wings of a small biplane.

Hans Nolbein had discharged it toward its foul goal!

"KEEP him covered, Barney! If he moves, blow his brains out," Keen roared. Then he snatched the roll of blue-prints that lay on the table and spread them under the light. For what seemed minutes, he peered at them, studying each sheet carefully.

"Open cockpit, for one thing," he muttered aloud. "Regular controls connected into the robot mechanism with steel fingers. We can take care of this matter yet, Barney."

Nolbein still steadied himself against the control pillar. He glared with insane hate as Keen strode toward him. Then Keen pushed Nolbein from the column. The German twisted in agony and tried to reach the dial knobs, but Keen kept him clear. Nolbein snarled

like a trapped animal and tore at Keen with his long slim fingers. Finally the cripple went sprawling across the floor.

"You dirty coward!" hissed Nolbein.

"Coward hell! After all I did for you, you rat. You squealed on me to Lang. You crossed me about selling that plane and told me Hartney had purchased it when you knew Monkton—Colonel Monkton who was working with Hartney—had it all the time. You tried to double-cross them. You ought to be hung! I'm giving you a break to let you live now."

"You'll wish you had killed me, yet!" ranted Nolbein from his grotesque position on the floor. "I can still stop you."

But Keen was studying the dials on the control pillar. One indicated a true easterly course, the second was set for 3,000 feet, and the third showed it controlled the r.p.m.'s. of the engine. The reading was 2,250 r.p.m., indicating some light motor, perhaps of the Menasco type, running at top speed.

"Keep him away from this column, Barney. We want that ship to continue its course at that speed. I'll take care of the rest."

He looked at his watch, then stared at Nolbein with bitterness: "After all I did for you, Nolbein. You just couldn't go straight, could you? Couldn't play the game. Well, perhaps it is not all your fault, after all, considering how much you have gone through. But it's too bad you couldn't forget the past and be satisfied to build ships as only you can. You could have made a lot of money and had a grand time up there at Wooden Ball Island. But no, you still retain your old bitterness, your old war-time animosities. Well, I'm now going to double-cross you. I'm going out to get that ship, if it's the last thing I ever do. Barney, you keep him covered. If he moves a foot, drill him cold and take his ship—he must have one around here somewhere—and beat it back to Long Island. I'll see you later."

And with another grimace at the prostrate Nolbein, Kerry Keen slipped out of the shack and disappeared.

ALREADY a low light was noticeable in the East as he released the cables that held the black amphibian. The big sixteen-cylinder engine, still warm, opened up with a roar. Keen had drawn the Skoda levers out to make certain there would be no back-pressure to hinder her starting. Then with careful maneuvers he took her out of the cove, gave her the gun, and headed into the wind.

The black amphibian climbed beautifully as he depressed the switch that wound the pontoons into their retracted positions. He checked his course as due east, let in the small automatic-pilot set, and turned his attention to his actual goal.

"He said 43:10 North by 68:40 West," he mumbled to himself, making a check mark on his North Atlantic chart. "She does about 126 top and has been flying now about ten minutes."

He fingered his slide rule, worked out the probable position of the robot plane,



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and marked it on his chart.

"She's about thirty miles out from Star Island now," he calculated. "I can do thirty miles in ten minutes with ease. I should catch her in about fifteen, at that rate."

He settled back, taking over from his automatic pilot, and set himself the task of seeking the mysterious ship now being directed by a small box back there in Nolbein's Star Island shack.

Several minutes passed. He checked his clock and compass again and peered about.

"Any time now," he calculated. "Funny, but I have a queer feeling about this. There's something eerie in a ship that flies itself. I always was a sucker for ghost stories and if this isn't one, I've never heard one."

His mind was running through the events of the past twelve hours. Nolbein delivering his ship and boasting that

he would kill Major Clyde Hartney. The fact that there had been two such ships mixed up in the affair, one set as a trap for the other. Nolbein, the fawning little inventor, who actually was his deadliest enemy. Hartney and Colonel Monkton, who believed they had the "steal" of the robot plane sewed up. And now the mysterious vessel out there with a trail-net, waiting the arrival of their great prize.

He wagged his head and smiled at his own reflection in the clock face. Then he noticed that his ruminations had lasted longer than he had expected. More than fifteen minutes had passed since he had left Star Island.

Then the clock did something startling! The face cracked, in a shower of glass and a length of spring twirled out of the open orifice.

Keen jerked the amphibian out of the play. A streak of spluttering tracer

spat his wing-tip and Keen twisted in his seat and saw a snarling fighting biplane rocketing down at him from above and behind. Just at that moment he glimpsed the robot plane ahead, but now there was other business to attend to.

"Sap!" he growled at himself. "Wool-gathering, when you should be on your toes. What would Barney have said about this?"

The menace behind him came down harder, curling slightly to get another burst in. The gentleman above was coming in again with guns blazing. He was taking no chances. Lead spat from wing-root weapons and out of the black orifices above the Vee-banked cylinders of his motor. Keen darted back and forth to escape the fire.

"What the deuce is that?" he barked aloud. "Small, dull gray biplane—undoubtedly a Fokker D-19, one of the

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latest. Batches of revs, range, and pop-guns. Here's real opposition, Mister Keen. You'd better work fast!"

And Keen did! The amphibian was thrown into a series of dizzy maneuvers that left the trim Fokker standing. He noticed that she carried no international markings, but he had a good idea who owned her—a gentleman whose last name was Groener!

"Came off a catapult, I'll bet a hat!" he mused, throwing his machine into a half-loop. "Probably expects to get back on a drag net towed by some disguised tramp steamer out there, and yanked aboard by a boomed crane. Well, the best laid plans o' mice and men, as Bobbie Burns said . . ."

He flipped the amphibian into a half-roll at the top of a loop, but the Fokker followed beautifully. Keen noticed his danger, skidded out of a long burst of heavy fire, and smiled.

"I'll try it again, and see if I can fool you next time," Keen muttered. "You Jerries seem to have that drag-net landing thing down pretty fine, but you're not going to hit, Herr Groener."

THE amphibian went down again in a dive with the roaring Fokker behind her. Keen yanked her up and over, but this time instead of whipping out into a half-roll, he continued on, after feinting such a move. The German behind him, opened his guns, went into the expected half-roll, and shot out clear expecting to find his quarry. But the amphibian had roared around in a tight loop, and before Groener could figure what had happened, Keen was behind him, cutting down the distance madly, his heavy caliber guns barking in triumphant unison.

The startled German tried to get clear, but it was all over. Keen hung on, pounded every ounce of power into the sixteen-cylinder motor, pressed every trigger control he had. The Fokker broke up in a welter of struts, spars, and slabs of curved metal. Down she went in a wild tangle, screaming, a long black plume of smoke acting as her burial shroud.

Keen quickly checked his course, set the amphibian on its true line, and stared about. He had no idea what time had been consumed in the scrap, for his clock was no more. The robot plane was nowhere to be seen.

He gave the amphibian the guns, checked the controls gingerly, and scoured the skies. He was well over 4,000 feet now. Then, Old Sol himself came to his aid. The golden glow, streaking across the horizon, caught the trim wings of the robot craft heading as straight as an arrow for a small oblong blotch that lay on the surface not two miles away.

With a low cry of triumph, Keen nosed down. He rolled back the splintered greenhouse covering above his seat and loosened his belt. Then he shot under the little biplane and inspected her carefully. His flap-controls allowed him to air-brake the amphibian to the same speed as the robot-plane.

"Perfect!" he smiled, looking up. "Neat, narrow cross-bar. Front leg well

clear of the leading edge and plenty of room to clear the prop arc. Well, let's go, baby. Drury Lang wants that ship back."

**BONG!**  
Something crashed out dead ahead of him with a tremendous concussion. He blinked.

**BONG! BONG!**  
Two more such deafening concussions barked, and the two ships rolled madly in the concussion. Then the little biplane above him gallantly steadied herself and plunged out—toward a non-descript tramp steamer plunging below through the rollers and dragging a long canvas and wicker landing mat at her stern!

Keen took it all in at once. "The devils came loaded for bear, all right. High caliber Q.F. guns aboard, too. Got to work fast now."  
**BONG! BONG! BONG!**

THEN began one of the maddest contacts the air has ever known. The robot plane seemed to hesitate in her course, and Keen sensed that she was being taken over by the robot-control set aboard the ship below. He drew the amphibian in closer, undid his safety belt, and watched the little biplane. With a low cry he sensed that she was being directed into an easy glide. The motor seemed to have been throttled down by an unseen hand.

"There's still a chance," he muttered. He maneuvered the amphibian under the biplane, as the guns below continued to blaze away. Then clambered up on to his seat, steadied himself against the cowl frame, and placed his right foot on the top of the stick. By careful handling he brought the amphibian close enough almost to touch the belly of the biplane.

His mind was racing as fast as the shells that sought him. He could see the gun crews on the deck, and a cruel idea came to him. He waited a second longer, then reached up and grabbed the biplane's cross-bar. He felt the ship jerk up, as though someone inside had drawn the stick back. Before he left, he rammed the stick of the amphibian forward, intending to direct it straight at the tanker—but something exploded immediately beneath him!

As he dangled from the cross-bar, the amphibian below him disintegrated in mid-air and tumbled away, a shapeless mass of metal and flame. The gunners had scored a direct hit!

"Nothing like timing things right," he panted, working his way along the cross-bar to the wheel.

But the biplane was under control again, heading straight for the trailing mat at the stern of the vessel below. Keen struggled like a madman. Finally he clambered over the rounded leading edge of the lower wing. He took a quick look and saw that the robot plane was not more than three-hundred yards away from the landing mat! They were already swinging a boom over ready to drag it aboard.

He stood on the wing-root, stared inside the cockpit, and saw that the throttle and control stick were con-

ected by long steel rods to a large black box fastened under the instrument board. He tugged at them, but they were bolted hard.

He swore as the biplane eased toward the mat. Then with a final effort he reached in with his automatic, and fired three times.

The controls broke clear, and he snatched over at the throttle and rammed it over. The motor opened up with a roar. He grabbed at the stick, drew it back sharply. The next thing he knew the robot-plane was slamming madly at the aft mast of the tanker like a thing completely berserk.

Keen shut his eyes, dragged the stick over toward him, and hung on, expecting within the next second to be smashed. There was a light jerk. The upturned wing-tip had scraped across a boom cable but had cleared safely. He waited, sensing that the ship was in a dangerous side-slip and sliding toward the water. Then, at the last minute, it leveled off and raced past the fo'castle deck, with half a dozen men firing point blank at him.

How he cleared them, he never knew. But he stayed on the wing root, headed her clear, then clambered inside and felt for the rudder.

Again the automatic blazed to rid the pedals of the rods connecting them with the robot-control cabinet. But at last everything was free and he was able to fly it out with the Q.F. guns behind him firing away furiously but completely frustrated.

IT was broad daylight when he reached Montauk point. Keen had been figuring plenty all the way back. He had the robot-plane, but what could he do with it?

"Well," he muttered to himself, "she flies well and she's inherently stable. I wonder if I could get away with it . . ."

As he ruminated, a small seaplane was cutting in on him from the north. Above the open cockpit beamed the broad, homely mug of Barney O'Dare.

He gave Barney a signal, and in return, the Mick signalled back with an Aldis lamp.

"Nolbein conked out. Bum heart, I guess."

"The best way, too," Keen agreed. Then he gave Barney some orders by code, using his open hand for dashes and the closed fist for dots. Barney nodded. Then working from well out over the Sound, Keen checked the drift with a smoke streak coming from a Sound steamer and nosed the biplane down for the open landing field in front of the government experimental hangar. He steadied her gently, tied the stick into a neutral position, drew the throttle back, and let her glide toward the field. Then he climbed out of the cockpit, pulled his rip cord, and let his parachute pull him off. He floated way and saw the little biplane go down under her own stability, hit the edge of the field, screw around once, dig in a wing-tip, and finally climb gently onto her nose. Keen hit the water neatly,

slipped out of his harness, and waited for Barney to pick him up for the second time in almost that many hours. The little seaplane took off with Keen flat across the port pontoon and was away before anyone at the field had noticed what had happened.

In half an hour, after clearing well out to sea, Barney brought the plane opposite Grayfields and let Keen off. Then he flew away again after handing a roll of blueprints to the dripping man on the pontoon.

"Get rid of that crate, Barney," Keen ordered, "if you have to kill yourself, doing it."

Then he raced up the concrete ramp and disappeared.

BY the time Barney had returned, after piling the seaplane upon a rocky shoal south-west of Hampton Bays, Keen was completely changed and had prepared a breakfast for the two of them. Barney first reached for a bottle, then sat down content. As they ate, they compared notes on the adventure. And then, Keen tossed the small tin first-aid box over to his Irish companion.

"A little to go on with, Barney. The account is getting pretty low, eh?"

"It will be after we get another ship—if ever," grinned the Mick.

"Oh yes, and there will be a nice donation to the Seaman's Institute, this time. It's awful what some of the boys on the sea have to go through, what with amphibians dropping out of the

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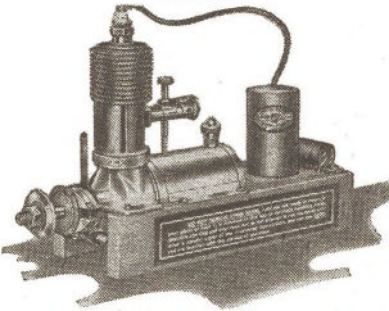
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sky upon them."

"Twenty-five grand?" asked Barney.  
 "That will do. And, oh yes, the same amount to the President's infantile paralysis fund, you know. But this has got to be under cover. Old Lang will be getting wise one of these days."

The telephone bell rang.  
 "Speaking of Lang . . ." smiled Keen, taking up the receiver.

"Hello!—Yes, Keen speaking," he answered.

"Hey, Keen!" beamed Lang from the other end. "That business about the robot plane thing is off. You can forget it."

"Really? What happened?"  
 "Well, lots of things happened. First off, we got the Griffon at last! The Coast Guard picked up a wrecked plane off Nantucket somewhere and there was a guy in it with a scarlet mask . . . well he had been wearing a scarlet mask, but half his head was shot away. Someone got him, somehow. Anyway, he had a lot of those cards marked 'The Griffon' in his pocket, so he's accounted for at last."

"Oh, I say, Lang," protested Keen. "You can't do that. I'm supposed to be the Griffon, you know. I'm the one who gives all the money away and all that. You can't shove me off like that."

"Aw, forget it. I was only kidding. Besides, the robot plane is back."

"Back?" cried Keen incredulously.

"What do you mean?"

"Well, it's back. The damn thing flew itself back alone. Piled up a bit, but it's all there. No one knows how it got back. A funny thing, too. They found Major Clyde Hartney dead in the office with half his face blown away—just like this guy they found in the plane up there."

"Who did that?"

"We don't know yet, but there was a card on the desk marked 'The Griffon.'"

"Then the Griffon went back and killed Hartney and then flew off and was bumped off himself. Well, that certainly puts me in right again, eh?"

"Sure . . . er . . . wait a minute, Keen. What was that you said? . . . There's a guy here from the experimental field, who was there when the robot plane came in, and say, he claims there was a card stuck on the instrument board and that it said 'The Griffon'! Now, what do you make of that?"

"What? . . . Why you said the Griffon was killed in a plane off Nantucket," gagged Keen, winking at Barney.

"I give up . . . I give up," moaned Drury Lang, hanging up the receiver.

"A squirt of O'Doul's, Barney," smiled Keen. "Old Lang is more puzzled than ever. But we'll mail him those blueprints just to make him feel better, eh?"

## On the Light Plane Tarmac

(Continued from page 27)

wings for light planes. Col. Clarence Chamberlin has tested Atwood's first model, which is powered with a small 36 h.p. motor of cheap, but reliable, manufacture. Without the motor, the ship weighs 500 pounds and the materials required to build it are said to cost only \$60. In constructing, Mr. Atwood takes strips of birch veneer, two inches wide and running between ten and twenty one-thousandths of an inch in thickness, and then with a new thermoplastic substance he has invented, fits them together under pressure to form into the sections desired—fin, rudder, wings, tail, and body. A twenty-foot birch tree eight inches in thickness provides all the veneer necessary to build a single-seater model. It is said that cabinet makers can put this machine together and that since they are paid much less than trained aircraft workers, could manufacture the planes at a very low cost. There's something to think about, you light plane fans.

ITALY has gone light-plane, too—awfully light.

The Royal Aeronautical Club of Rome has offered 100,000 lire (figure it out yourself) for the first person "who can solve the problem of human flight." A technical commission was named to draw up regulations.

From where we sit, there won't be an umbrella left anywhere in Italy within a few weeks. But maybe we haven't heard right.

THEY are in a swell sweat over in England—the kind we wish we were suffering.

It's all about the Drone light plane that started out as an ordinary glider. Then someone put a light 16 h.p. motorcycle engine on the wing and it was discovered that any air student with half a brain and a little ambition could fly the thing after reading about half the first page of the instruction book. It was not quite that easy, of course, but the ship displays such stability and ease of control that after an hour or two of "hopping" it around an open field, the student finds himself actually flying it before he realizes what happened. The Drone does almost anything an ordinary light plane does, and they can sell it for \$1,375.

But here's the joke—on the Air Ministry.

It's the license business. The Drone is making a monkey out of the flying racket. The officials are all in a muddle

because a winged bug has been built that can be mastered in about one afternoon. It's all wrong! You see, they can't give you an "A" license (private to you) on just Drone hopping because you *really* couldn't fly a regulation powered plane. Then, it's not a glider because of the pop-pop arrangement up there on the wing, so what the hell, Reggie!

But the manufacturers of the Drone are figuring it out and getting ready for a bumper business by suggesting that the Air Ministry issue an "intermediate" license for Drone pilots. And that's an idea!

**N**OTHING to light plane clubs, eh? Listen to this—

In the first half of this year, the number of new pilots licensed in France through light plane clubs was no less than 150, and the number of touring private aircraft purchased grew from 168 to 1,100. Last year there were 46 private clubs. Today there are 141. But here's the best of it: The light plane club membership has leaped from 45,000 to 150,000—all potential air pilots! No less than 13,000,000 francs have been spent on private aircraft and an additional 3,000,000 had been spent on landing fields and clubhouses by the Federation Aeronautique de France. Then, to make us pull out more tufts of our thinning hair, the Federation unanimously voted to abolish the tax on aircraft together with hangar and landing taxes.

Lafayette, we are here—grounded!

**A**USTRIA comes through with a neat little air guide, printed in several languages, for the sole use of private pilots who may be interested in a little dash around the country. In it, the

Osterreichischer Aero-Club gives geographical details, positions of aerodromes, and full plans of the eighteen aerodromes that are available to the touring pilot. They are not waiting for the \$700 plane over there.

**T**HEY'VE even laid their shillalahs aside in Ireland in favor of the joystick. Fifteen new "A" licenses were awarded to club pilots and one was given his "B"—the same as our limited commercial. In one year, the value of privately owned aircraft rose from \$13,600 to \$86,500. Sure, and it's a fine game, Pat!

**R**EMEMBER the Air League we were advocating some time ago? Nothing came of it because no one with any real national background would give us a hand. But just to show what can be done, we might explain that the Air League of the British Empire has instituted a Young Pilots Fund. Fifty grants were made recently. It works out this way! If a youngster has saved, say, one hundred dollars to invest in an air course, he goes to the Air League, shows them the money, and tells his story. They kindly pat him on the head, admit he is a smart boy, and give him another hundred to go and buy his instruction. If he had brought five hundred, they would have doubled it just the same! That's raisin' 'em!

But never mind, the United States will show 'em yet. We did it with the automobile, and we can do it with aircraft. We'll all be on hand when the sky is full of ships, gliders, and reckless air drivers.

Go ahead, Joe Archibald—you draw the picture.

—THE EDITORS.

## So You Want to Fly for Uncle Sam!

(Continued from page 8)

tion of this period, you will revert to civil life; but in order to keep up your proficiency as a pilot, you will be permitted to fly Army aircraft at no expense to yourself.

There is, at present, an excellent chance for Reserve officers to obtain commissions in the regular Army Air Corps. Forty-two reserve officers have just been given such commissions, and a great many more will undoubtedly be taken in with the expansion which is now being put into effect.

**T**HE Navy has just begun a new program of training within the past few months and has created a new rating, that of Naval Aviation Cadet. This program is designed to bring up to treaty strength the number of our flying sailors. If you want to fly and like the sea, here's your chance to get plenty of both.

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College graduates are given the preference. However, if you can't boast of a sheepskin, but have an equivalent knowledge with training in advanced arithmetic, algebra, geometry, trigonometry, and physics, you have a good chance of being accepted. Write to the Commandant of the Naval District in which you live (the United States is divided into 13 Naval Districts) and ask for an application blank. If accepted, you'll be told to report before a Naval flight surgeon for the physical examination, which is somewhat similar to the Army's. If you're found to be of sound mind and body, you will next be interviewed by a couple of Naval Aviators who will look you over and see if you are suitable officer material. The Navy is particular about

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whom it gives commissions. Not every Tom, Dick, and Harry is allowed to wear the stripes.

When all the preliminary red tape has been unraveled, you will be enlisted as a seaman, 2nd class, and ordered to the nearest Naval Air Station for a month's (and they named it well!) "elimination training." This program, consisting of dual flying instruction, is designed to find out, by actual test, whether or not you've got the stuff that will make a Navy pilot.

If you're not eliminated, you then receive your appointment as an aviation cadet and your real flying career begins. You're packed off to the Navy Flight Training School at Pensacola, Florida, where Uncle Sam trains his sea-going birds of prey. The course you will take at Pensacola is exactly the same as that given to line officers of the regular Navy, and you will have Annapolis graduates training right beside you.

Ground school occupies half of each day for the first eight months (the whole course takes about a year) and includes such subjects as Aviation History, Theory of Flight, Engines, Rigging, Aerology, Navigation, and so forth.

Your first training at Pensacola will be with Squadron 1, where you will learn to handle primary type seaplanes. Salt water, Navy flyers will tell you, is good for dandruff and solo students, and as soon as you have made your first hop with the front seat empty, you're due for a ducking in Pensacola Bay. That's a time-honored custom at the school and even rank doesn't escape.

Not long ago, a Lieutenant Commander was given an unscheduled bath, by junior officers. If you don't solo in ten hours you are "washed out."

As soon as you have learned the wiles and dodges of the lumbering primary seaplanes, you're transferred to Squadron 2, at Corry Field, where you learn to handle primary landplanes. Formation work begins and you get a taste of real Navy flying.

Next, you are sent to Squadron 3, and here you make your acquaintance with service type planes—types that are used on the carriers. You learn how to perform advanced maneuvers in formation, make extended cross country flights, and master the intricacies of aero radio communication.

After the final checkride with the Squadron commander, you will be sent to Squadron 4 to master the "big boats." Handling these flying apartment houses is a real thrill. How awing it is, riding way out in the nose, to look back at the huge ship following after you. Those motors seem to be trying to overtake you.

With No. 4, you get your first real crack at avigation, flying hundreds of miles out over the blue waters of the Gulf of Mexico, trying to intercept a barge that is steaming constantly forward. That sort of training will stand you in good stead when you're flying off carrier decks. Then comes bombing and torpedo training.

Now you're on the final lap of the course and ready for its biggest thrill—flying the hurtling fighting planes with Squadron 5. Piloting these ships is like riding the tail of a comet! Aerobatics, difficult cross-over turns, dog fights with camera guns, firing at sleeve and ground targets, altitude hops to 25,000 or 30,000 feet—will occupy most of your days.

**A**FTER your final check ride, you're ready for graduation and the goal you've set your eyes on ever since you first applied for training—those shiny gold wings. It's been a hard course, harder than anything you ever had to do before, but it's been worth it.

Now you're ready for 3 years' duty with the fleet—and increased pay.

Aviation cadets, while undergoing instruction, receive \$75 a month, and \$1 a day subsistence allowance, just as do flying cadets of the Air Corps. After the completion of training, they receive \$125 per month, including flight pay, \$1 per day subsistence, uniform allowance of \$150, and the Government life insurance of \$10,000. When the period of active duty is up, a cadet receives a lump sum of \$1,500 in addition to any pay or allowance to which he may be entitled. He is then commissioned an Ensign, U. S. Naval Reserve, and returns to civil life. He, too, is permitted to fly Naval aircraft at Government expense throughout the year.

Marine Corps reservists are given exactly the same training that is given in the Navy. Applicants must be college graduates between the ages of 20 and 27. Upon completion of the year at Pensacola, they are commissioned 2nd Lieutenants, U. S. Marine Corps Re-



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Navy instruction.

A word to you fellows who are still in school: Arrange your courses to make yourselves eligible for appointment with the accent on mathematics and mechanical training. And keep yourselves physically fit. Then, one of these days, maybe you will be flying in Uncle Sam's first line of defense.

## Flying Aces Club News

(Continued from page 52)

and who would like to join the FLYING ACES CLUB, see "Bob" Hartwell, 905 Christie Ave., for information.

Bob says that he feels well repaid for the ad and recommends this method of recruiting to other F.A.C. units.

Well, here's some news from Austen Newhall, of Springfield, Mass.—ar' ya listenin'? We'll bet it's good news, for you'll remember that Austen is the fellow who induced Amos 'n' Andy, Walt Disney, and other famous individuals, to join the F.A.C. Possibly he has another honorary member! Sure enough he has! This time it is no other than the National Boy Scout Commissioner—Daniel Carter Beard. Good work, Austen—now the D.S.M. is yours!

Now here's some "dope" about honorary members—and we don't mean electrical transcription! Col. Paul R. Guerrero, Tacoma, Wash., has been instrumental in bringing into the club the Hon. Pedro Guevarra, Senior Resident Commissioner from the Philippines, and Mrs. Guevarra; Walter Johnson, Spencerport, N. Y., has landed Jimmie Mattern, famed flyer; Wesley Martens, Hollis, L. I., has sent us a letter from Frank T. Courtney, Atlantic flyer and Captain, Royal Flying Corps., accepting honorary membership; while Gordon McNutt, Ridgway, Penna., has

called our attention to the fact that in the last issue we left out the name of Capt. Harry Garrison, Pittsburgh. Gordon tells us that Captain Garrison has made more than 3,000 chute jumps. (Advertising Department—page the manufacturer of those parachutes, for they must be GOOD!)

Before signing off we would like to ask the following stations of the F.A.C. Radio Communications Corps to contact each other, and we'd like the Operator of each station to report his success to GHQ. The stations are: W3ARM, Richardson Park, Dela., W3ELJ, Covington, Va., W2IHF, Bayonne N. J., W8FTB, Rochester, N. Y., DP1A, Boston, Mass.

In "signing off" we give this message, using G-2 code, D.X.1, to all members: Air, tip, rip—7—Gas, Bay, map, dud, bag—bay, rib—22—tip, mec, bag, map, hut—fog, hut, spy, spy, bag, foe, map, fog, mec, air, map, hut, foe, bar—fog, hut, tip, rib, bar.

F.A.C.'s, Radio is a wonderful way of spreading the news of our club and fine magazine; it is a fine way to make new friends, and we can't think of a quicker way of telling a lot of "O.M.'s" and "Y.L.'s" that they should really know FLYING ACES—radio waves travel at the rate of 186,000 miles per second!

Cheerio, until next month!

DOUGLAS ALLEN.

## Sea Gullible

(Continued from page 12)

"Somebody is a copy cat around here." "I think you're a liar," Bump Gillis shouted. "I've seen that trap before in your—"

Again the door was pushed open. The ordnance officer appeared on the threshold. At first he could not be recognized. He appeared to have been white-washed from the scalp down, the process having been halted around his belt line.

"I open my door and a pail of this stuff conks me," he gurgled. "A joke is a joke, but this is a new outfit I've got on. I demand—"

Major Rufus Garrity passed a hand over his eyes and struggled up from his chair. "Gentlemen," he moaned, "I wish you'd all go an' leave me. I want to be alone."

The next morning the Squadron C. O. announced to Lieutenant Phineas Pinkham that he was about to arrange a two-week leave in Paris for the heir of Boonetown's noted family.

"I know when I'm licked," the Old Man cracked. "I got enough."

Captain Howell and Lieutenant Bump Gillis hurried to the Operations office when the news had spread.

"You can't give that bum a leave," they chorused. "It'll cost us—"

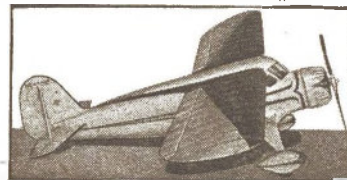
"Who the h— told you fatheads what I could do and what I couldn't do? Get out or I'll have your wings to pin to my butterfly collection." The C. O. emphasized his words by throwing a bottle of ink against the wall. Phineas poked his head in through the door as the two long-faced pilots headed out.

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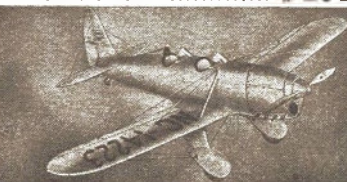
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"I hate trains, Major," he began. "Could I fly to Paree this time? It wastes time on trains an' them Frog pullmans are—"

Garrity looked for the ink bottle and found he had already thrown it. Speechlessly, he jumped up and down as if he had stepped into an ant hill without any shoes on.

"Well, I asked just in case," Phineas hastened to say, and vanished hurriedly.

In his hut the prospective traveler once more poured over the pages of the booklet containing pictures of the various places one could visit if time and money were available. Phineas had both. But he had no idea of going to Paris. He had already been there.

"Say, it's a long time since I went fishin'," he mused. "I feel just like doin' that for two weeks. Now let's see, how far is it to Dunkirk? That's on the North Sea. Maybe I might even get to see a submarine—" As he spoke Phineas was removing the bandage from his head. He got up and went to the mirror to observe the scar.

"Boy!" he chuckled. "I feel like my dome ought to ache, it looks so real! Haw-w-w-w! Well, I must start an' do my stuff if I don't want to ride on a Frog train. I won't be responsible for my actions from now on."

Bump Gillis and Howell walked in, deposited a heap of francs on the Pinkham cot.

"Why, how do you do?" Phineas greeted them. "What can I do for you? Your names, please?"

"H-Huh?" The pilots exchanged glances. Howell spotted the scar on the Pinkham cranium and his jaw dropped.

"Look, Bump! He got a worse wallop than we thought," the Captain exclaimed. "Why—he—"

"How did I git here?" was Phineas' next remark. "What's the idea of shanghaiin' me? Where's the captain of this boat?"

"Carbuncle," Bump Gillis forced out, "I'm your pal—Bump Gillis. Remember?"

Phineas shook his head. "I was mindin' my own business when it happened," he said. "Look, is this my name?" He pointed to an address on an envelope.

"No, that's me," Bump said. "Ah—er—Captain, we got to get out of here an' tell—"

"So you're the Captain of this ship!" Phineas yipped. "Well, you put me ashore this minute!"

Howell and Bump ran to tell Garrity. The Old Man appeared at the Pinkham cubicle a little later and entered cautiously. "It's only me, the Major," he said. "How are you, Pinkham? That's quite a wallop you got. Why didn't you tell us? Ha, just thought—er—the pilots here said you weren't feeling so good an'—"

"Huh?" Phineas shot out. "Why, I never felt better. I haven't even seen those fatheads all evenin'."

"Wha-a-a-t?" yapped Howell. "D'ya mean to sit there an'— all right, what's your name?"

"Pinkham, you crackpot!" retorted

Phineas. "What is this, Major?"

"Kid me, will you?" the Old Man snapped at Bump and his fellow offender. "You don't go into Bar-Le-Duc tomorrow for that!"

PHINEAS' leave was assured the next morning. With the coveted paper in his pocket, he sauntered around the drome in fine spirits. Sergeant Casey met him in front of "B" Flight's hangar and wished him luck in Paris.

"Why, I don't know you!" Phineas said. "Can't I just walk down to the drugstore without panhandlers accostin' me? Do you know who I am?" Casey, having heard of Lieutenant Pinkham's strange behavior the night before, shook his head and edged away.

"I am the guy whom you think you are, ham-w-w-w-w!" was the amazing response.

The Old Man heard about that, too. "Somebody's nuts!" he bawled and ran to his quarters. He decided not to come out for three hours.

Meanwhile the Boonetown marvel was getting ready for his vacation. He crammed several articles necessary to the practice of skullduggery into the pockets of his trench coat. Then he picked up the travel booklet that he had been perusing for days and placed it in an inside pocket.

"You never can tell. I might visit them places," he grinned as he went out.

Phineas had timed everything well. He knew that there would be a couple of Spads ticking over. An hour ago the mechs had been working on them and testing them out. He knew the squadron car was waiting for him, too. So he walked across the field and threw his bag into the back seat.

"Wait a second," he called to the driver and strode toward a Spad. Casey was a few feet away, his ear cocked for alien sounds in the doctored Hisso's throat. He eyed Phineas askance.

"Well," exclaimed Lieutenant Pinkham, "How are you, Casey?"

"I got an idea why you're puttin' on an act, Lootenant. If you think you can git that crate—" Casey growled. "The Old Man said he'd bust me if ya ever got another Spad without his permission."

"Why," chuckled Phineas, "I only come to say goodbye, Sarge. Why—you don't think—"

"Ha, ha," the flight non-com laughed shakily. "Sorry, sir." He held out his hand.

How it was done, Casey never knew. But he did know that when he tried to get to his feet, there were handcuffs on his wrists. Alongside of him was a little book the cover of which bore an illustration of two jui-jitsu performers. And Phineas Pinkham was jumping the Spad over the tops of trees at the north end of the field when Garrity and twenty more men reached the scene.

"I said he was nuts!" Howell shouted. "Why, he put his bag in the car an'—I bet he thinks he's on patrol."

"Ya didn't ask me," Casey growled. "But I'll tell ya what I think. He didn't want to ride in them trains. He put on

an act to steal a crate an' when ya see him again, he'll claim he don't even remember it."

"Oh, that double-crossin' cluck!" exploded the Old Man. "I'll have him in Leavenworth—you see!"

"Sure, then I'll believe it!" Bump Gillis drawled disdainfully. "I still think he's nuts and he don't need a scar on his dome to convince me. He'll always have an alibi as long as we got dome specialists. To h— with him!"

"He wasn't too nutty to take them francs of ours with him," Howell spat out. "What a time he'll have in Paree!"

"Oh yeah? Ha ha!" Bump Gillis ankle away. "The last thing he showed me that didn't blow up in my pan was a travel book. On the Channel ports!"

An hour later word came to Major Garrity from an airdrome near Soissons that a goofy pilot had landed a Spad and had gassed up. Said he had been grazed by a Boche slug and had lost his way. Couldn't remember his name.

"It looked like your flyer, Pinkham, to me," the Soissons' officer said to Major Garrity of the Ninth.

"It was!" the Old Man shot back. "Stand by for a report from him in Stockholm. He's going swimming at one of the Channel beach resorts. G'bye!" He hung up.

"They're all nuts at that drome," the Major at the other end of the wire growled.

Phineas Pinkham, skimming high over the roofs of Arras, was thoroughly enjoying his leave. Over Douai he almost ran into a pair of Boche Fokker D 7's and had to make a wide detour. It delayed his arrival at Dunkirk by half an hour. Phineas had intended to take his time and pick a nice landing field but the Fokkers had planted some slugs in his Hisso. The lead poisoning had been slow to cramp the Spad's giblets but over the Channel port it went to work with a vengeance. Three members of the R. N. A. S. sat in front of their barracks and watched Phineas Pinkham's crate miss the lighthouse marking the entrance channel to the roadstead of Dunkirk's harbor, and come slicing down toward the sand banks.

"He'll jolly well rip up a lot of sand when he hits," a flyer commented. "Fancy a Yankee Spad coming here, what?"

"I think we'd best start over to pick up the remains," the other Limey pilot said and called to a non-com.

It took the better part of an hour to locate the visitor. Finally Phineas was found clinging to the anchor chain of one of the boats that dotted the harbor.

"It's about time," he gargled. "Is this Limey hospitality? I skidded over them sand banks an' landed in the drink. I been swimmin' a lot. Are you admirals or just coxswains? Why you've got wings! Haw-w-w-w!" Then the funny lookin' things over there are the birds you fly."

"I'll jolly well like to have you in one when we patrol the Channel," a Limey bridled. "Say, my good fellow, haven't I seen your face some other place?"

"I don't think so," was the fresh response. "It's always been in the same place—on top of my neck. Haw-w-w-w! You're talkin' to Lieutenant Phineas Pinkham. I am on a vacation and come up here to fish."

The Limey pilots got their heads together. "We could toss the impertinent beggar overside an' not a soul would be the wiser, Alf," suggested one.

"You tempt me, Ronny," the other said, "but I fancy we had better take the chap to the barracks."

**H**ALF an hour later the R. N. A. S. officers wished that they had succumbed to the urge to drown Phineas Pinkham. Commander Hamson informed them, after Phineas had been in their midst for four hours, that they would be transferred to the Dardanelles as soon as he could arrange it.

"Blarst it!" he yelled. "I would rather have had a visit from Kapitan Poison!" As he spoke he sipped his tea. "Aw-w-w-wk!" Floating on the surface of the delectable brew was a shiny black beetle. The Commander's stomach protested vehemently.

"Aw, don't let that spoil your tea, haw-w-w-w-w!" Phineas guffawed. "It's only one of my licorice bugs. It gits 'em all the first time. Haw-w-w-w!"

"Get the blighter out of here or I'll jolly well—" The Commander dumped his tea out of a window, swore, and left the mess.

"He has no sense of humor," Phineas grinned. "How's the fishin' around here?"

"Priceless," a Limey hurried to say. "Rather guess you'd like to turn in, old chap—if you're starting out in the morning."

Lieutenant Pinkham nodded. When he was being guided aloft, Commander Hamson returned to the mess room.

"Tomorrow," he chuckled savagely to a pair of pilots, "we'll give the Leftenant a taste of rough water. You'll take him up in a Short, Danning, and accidentally have a forced landing. Where it's the roughest, mind you! Would say off Furnes, what?"

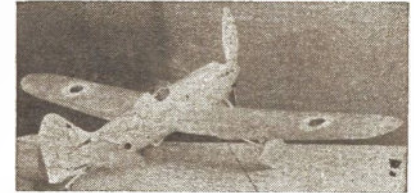
"Righto!" was the response. "We'll have no end of comedy. Pip pip!"

Early the next morning Phineas Pinkham came down to mess carrying a big coil of heavy fishing line, a box of hooks, and several funny looking things that looked like rosettes.

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|                         | 3/4 x 1 x 7/8 ..... 3 for 5c    |                  |
|                         | 1/2 x 1 1/4 x 10 ..... 2 for 5c |                  |
|                         | 1/2 x 1 1/4 x 12 ..... 1 for 4c |                  |
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| <b>BIRCH WHEELS</b>     | 1/2" ..... 2c                   | 3/4" ..... 3c    |
|                         | 1" ..... 4c                     | 1 1/4" ..... 5c  |
|                         | 2" ..... 10c                    |                  |

- |                          |                              |   |                           |
|--------------------------|------------------------------|---|---------------------------|
| <b>SHEET ALUMINUM</b>    | 005 in. thick, 6x6 ..... 5c  | <b>THRUST BEARINGS</b>                      | Small ..... doz. 10c      |
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|                          | 2 oz. bot., all colors, 10c  | <b>PAPER</b>                                |                           |
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**C**OMPLYING with the wishes of many of you readers, we have formed the FLYING ACES PRIZE CLUB! "Doug" Allen, your National Adjutant, is in charge and what a swell time we're all going to have! Just look over these prizes! Great, aren't they? You bet they are, and they're **YOURS ABSOLUTELY FREE!**

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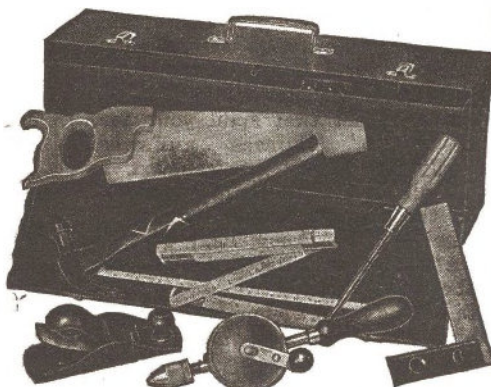
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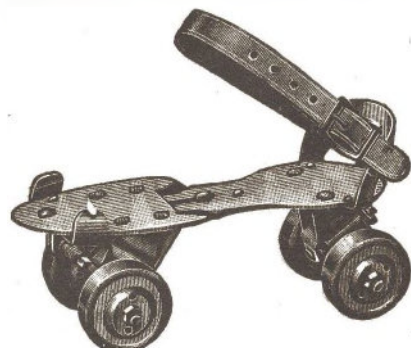
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This prize is offered as a result of popular demand. During the past few months many F.A.C. members, engaged in "G-2" work, have written us concerning such an outfit. Now you may have one of the same type sets used by not alone many police officers, but by the Federal Authorities as well. **SPECIFY PRIZE NO. 5.**

"It's swell bait," he grinned. "Red flannel never fails to make a fish bite. It's lucky that shirt was there as—"

A Limey officer choked on his tea, spat out a mouthful of toast. "My heavy weather shirt, you—" he yowled. "Blarst it, I hope you jolly well drown!"

The Limeys lost no time in leading Phineas down to a quay where a trio of seaplanes were moored. They were short N2B seaplanes, the official two-seaters of the Royal Naval Air Service.

"And you can really fly them bugs?" chuckled Phineas as an idea immediately began to spread out feelers in his brain. "I bet you have fun ridin' up the canals, haw-w-w-w-w!"

"How about a ride, Yank?" one of the pilots suggested.

"Boys," replied the willing subject of their experiment, "I am reckless with my life so the answer is *oui*. Does it walk like a duck until you get out in the open?" As he made the query, Phineas climbed into the pilot's pit. "I want to listen to the power plant," he explained. "Tell the flunkey on the pontoon to spin the prop. I bet I can fly this thing, as there ain't nothin' with wings—"

A British pilot got into the observer's pit when the prop began to suck spark. The N2B was released from its moorings and swung about to face the open water. Phineas gave the crate the gun, forgot he was not in a Spad, and almost turned a complete somersault in the drink. The observer leaned forward and yelled at him.

"Relax!" the Yank hollered, grinning, and taxied out through the roadstead. He zigzagged through a cluster of Allied shipping, missed by a whisker a motor launch filled with Naval officers, then began to describe figure eights on the surface like a fancy ice skater. The Limey climbed out of his observer's pit and jumped into the water. Phineas did not even know he was gone until several minutes later. When he turned and saw the vacant pit, he bared his buck teeth in an expansive grin.

"An' I been talkin' to myself all this time, haw-w-w-w-w!"

Phineas headed for the open sea. He got the N2B into the air, gave the Sunbeam engine plenty of gun, and skimmed over Dunkirk. After he had taken a look at the town, he banked widely and headed for the Channel.

"I bet you could fish out of these things," he enthused. "Boys, what a vacation!"

Wires buzzed across France. Insulation smoldered as the Limey Commander reported to Yank authorities that a fresh pilot from the U. S. A. had stolen a Short seaplane. Lieutenant Phineas Pinkham! The Boonetown wonder man was taking an aerial squint of Ostend about the time Major Rufus Garrity received the glad tidings.

"Well, that'll certainly wash him up," he yowled. "You'll never see that fat-head again. When the court martial gets through with him—"

Phineas, however, did not seem to be at all perturbed as he flew out over rough water. Three miles off shore he set the N2B down and was a little sur-

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prised at the cuffing it got by a choppy sea as he climbed out of the pit to the wing. There he sat and yanked the fishing tackle from his pocket. After tying a hunk of red flannel to a hook, the errant Yank dropped to a pontoon and threw the line, weighted with a chunk of lead, far out over the water. Hooking an arm around a strut, he settled down to deep sea fishing. The skipper of a Channel steamer spied him, ordered a boat lowered. But when it came up close to Phineas he waved his would-be rescuers back.

"G'wan, git out of here! Do ya want to scare the fish?" he yelled. "It's funny a guy can't—"

The boat returned to the mother ship. The crew reported the incident to a Royal Navy officer. "By gad!" the officer cracked. "Fishing! With a war going on! Fancy—the blarsted idiot. I'll look into this!"

Two hours later something struck at the Pinkham line, almost hauled Phineas right out into the brine.

"Eureka!" he yelled, bracing his feet, and hanging tight to the strut. "It's at least a swordfish. Well, now I will settle down to fight it—" About then he became aware that the N2B was skimming over the surface of the water. "Must be a whale, haw-w-w-w-w! Gosh, I wish I had a harpoon!"

**T**HE Yank from Boonetown, Iowa, twisted his heavy line around a strut and secured it fast. A shadow moved across the surface of the water. Phineas heard sounds like small rocks being tossed against the Short's wings. He looked up, saw a Jerry Brandenburg taking pot shots at him. He hugged the ship's nose and swore. Suddenly he saw white water ahead. Something broke the surface. It looked like a pole being thrust up through the water. Phineas' eyes bulged like an inflated toy balloon. The sleek hogback of a Jerry sub broke water while he stared. On the conning tower of the U-boat was a skull and crossbones.

"Oh cripes!" he groaned. "It's Kapitton Poison." In a fever of anxiety he felt in his pockets for a knife but found none. He uttered a squeak and attempted to get to the pit of the sea-plane. Somebody yelled at him. He looked over his shoulder and saw Jerries pouring out of the sub's hatch. Three of them skidded across the sub's dripping deck to tear the canvas loose from a gun.

"I quit!" Phineas hollered. "Kamerad! Uncle! Enough!" The U-boat maneuvered close to him. A Heinie yelled, "Yoomp!" and brandished a Luger.

Phineas complied as a pontoon point nudged into the side of the tin fish. Three Krauts grabbed him and dragged him to the hatchway. They pushed him down an iron ladder into the U-boat's control room where a bull-necked Jerry with a black mustache awaited him. Kapitton Poison was munching on a liverwurst sandwich and was looking quite hale and hearty.

"Zo?" he chortled. *Der vlyer he cooms chasink der tin fish yedt midt der hook mit lines, ho ho! Dumkopf!*

"You don't look like you passed more

than five grades," Phineas countered. "Well, where do I bunk?"

"Ach, idt ist nodt too much to eadt yedt ve haff," Herr Kapitan gutturalled. "Maybe idt ist insteadt you gedt der fish, der fish gedts you, nein?" He whirled and shot out an order.

As Phineas was letting the U-boat's commander's words sink in, the sub began to submerge. The Yank's ears told him so. His brain began clicking too. Phineas had heard that the smell of chlorine gas to U-boat occupants was like the taste of Paris green to potato bugs. He put his hand into his pocket and pulled out an "onion." In one corner of the control room there was a narrow passageway leading to the batteries below.

"Donnervetter!" the Kapitan yelled as he squinted through the periscope. "Der Allied ship yedt. Der Q-boat!"

Phineas tossed the "onion." It was a good shot. Several seconds later the inside of the tin fish was permeated with a most obnoxious odor. Kapitan Poison's face became as green as a bullfrog's back.

"Ach—Himmel!" he gulped. Oop vunce! Gott! Krauts came running out of the crew's quarters. They came from the engine room, from the torpedo room. The hogback of the U-boat broke the surface to meet a shell that was tossed from the Q-boat.

Blam! The pig boat shivered.

"Down again—ach!" Kapitton Poison brushed Phineas out of his way in scrambling to cram a wad of oily waste against his face.

"Make up your minds, make up your minds!" complained the Yank. "Otherwise we'll git the bends. My ear-drums are already deflated, haw!"

Blam! The sound of an exploding shell was deadened this time. A fat little Jerry came up close to Kapitton Poison and handed him something.

"Das ist der trick," he said, saluting. "I find idt der onion skin. Budt der onion idt ist nein. Smell vunce!"

Kapitton Poison sniffed at it, howled above the drumming of the Diesels, and grabbed at Phineas Pinkham, his unwilling passenger.

"Zo! Der trick ist das?" he roared. "Gott in Himmel, Herr Leutnant Pingham of der Yangkee Air Vorce! Eferybody look vunce! Ve haff captured der Leutnant. Ach, ve Chermans! Ho ho!"

"Awright," Phineas said, a little down-hearted. "What comes next?"

The Kapitan and his immediate inferior went into a huddle. After awhile they began to chuckle.

"It means no good to me," moaned their captive. "Well, I giss there's times when you can't win."

"Oop ve go," the U-boat commander said to Phineas. "Und der bath you gedt by der conning tower, ja. Ve yoost cruise yedt mid der periscope yoost above und your head also, nein?"

"You said so," cracked Phineas, thinking fast as usual.

Again the submersible broke water. Jerries pushed and kicked Phineas Pinkham up the iron ladder to the hatchway. Out in the open the Yank looked around for friends. The wastes were bare of anything but sea gulls.

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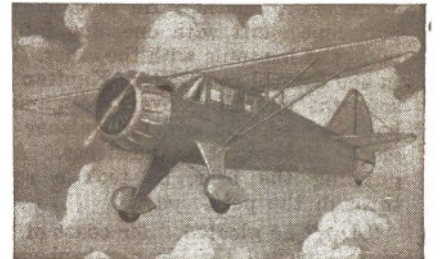
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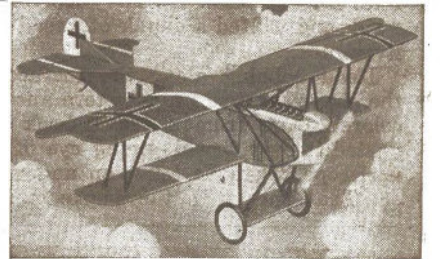
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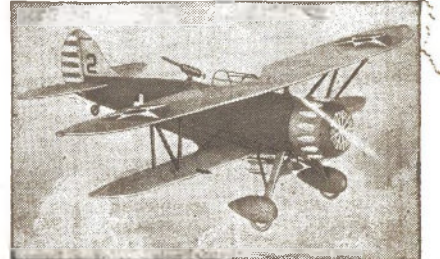
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Kapitan Poison supervised the lashing of *Leutnant* Pinkham to the conning tower. When that was done to his satisfaction, he called off his hirelings and led them down into the control room once more. The hatch slammed shut and *Herr* Pinkham steeled himself for that which was to come.

THE submarine began to submerge. White water seethed around the Pinkham cranium. He swallowed enough of it to make a salt brick inside his stomach, coughed up as much as he could, and clamped his teeth shut. A snaky bunch of kelp twisted around his neck as he struggled loose from his bonds. Phineas thanked his stars that he had included the great Houdini's book in his library of trickery. A hand came loose, another. He held onto the periscope shaft with one, dug into his pocket of his tunic with the other. Down in the control room, *Herr* Kapitan Poison was chuckling over the game he had bagged. He ordered pilsner and more liverwurst sandwiches. After guzzling the beer, he took a squint through the periscope.

"Ach," he gloated, "*der* coast of Belgium vunce. I see idt Blankenberg already yedt. In fimpf minute ve coom oop und see how *ist* idt *das* Pingham likes idt *der* bath. Ho ho!" He turned away and wolfed a chunk of bread and liverwurst.

Head bobbing along the surface of the choppy water, Phineas tore another colored page from a travel book and pasted it over the all-seeing eye of the periscope. Then he hung on and waited. That ship with the smoke curling

from its funnels had come up fast. It could not be more than a mile away now. If it was an Allied tub, the well-doused Yank mused, he was partly saved. He raised an arm above the water and waved. The ship was swerving from its course now.

"Boys," Phineas enthused, "if only *Herr* Poison keeps on thinkin' we're close to the coast instead of way out. Haw-w-w-w!"

*Herr* Kapitan, down below, squinted into the periscope after a prodigious swig of *schnapps*. "*Gut!*" he chuckled. "*Ve* coom oop und go into Zebrugge."

He snapped orders and the boat lifted its blunt snout a bit. Phineas slithered down from the conning tower, crouched against its wet steely sides. The mysterious ship was only a half mile away when the hatch cover of the sub began to lift. A Jerry poked his head out, swept the wastes with his eyes and let out a loud yell. But Phineas Pinkham was up on the tower before he could slam down the hatch. He grabbed the Heinie around the head and pulled him into the clear.

Blam! A shell hit close to the U-boat. Phineas slammed the Kraut on the nose and relieved him of his gun. With the Luger, the miracle man from U.S.A. poked the periscope's eye out just as Kapitan Poison himself thrust his head and shoulders above the hatch. Blam! The tin fish shook as if seized with ague. The shell bit a hunk out of its stern as Phineas conked Kapitan Poison on the noggin.

"Haw-w-w-w-w!" he chortled. "It is the worm that is backfiring."

Wham! Bang! A shell bit a hole in

the forward end of the sub and wiped away the mounted gun as if it had been but a spot of grease. Again Kapitan Poison got his head out through the hatch.

"*Kamerad!*" he yipped and waved a white flag. "*Ach, Leutnant*, don't hidt idt me again vunce. I moost wave *der* flag, *nein?*"

"I'll spare you," Phineas assured him. "Haw-w-w-w-w!"

Boats were being lowered from the Allied Q-boat.

"Look, Kapitan Poison, at my antidote. It is pretty pictures out of a book. I just pasted 'em over the periscope's eye and—haw-w-w! Maybe idt *ist* you drink idt too much *der* snoppes, eh?"

"*Ach, Goot*, sooch a business. Pictures—*Himmel!*" the U-boat Commander groaned. "*Dumkopf* I am yedt. I look at *der* vater und it should half moofed. *Ach*, I don't see idt yedt—bummer I am. *Der* ship idt sneaks oop und—"

"Aw don't feel so bad," Phineas comforted him, leaning against the conning tower. "I've licked as big Heines as you before. It was some fishin' trip, eh Cap'n? Haw-w-w-w-w!"

The Allied tars landed, took Kapitan Poison and his crew into custody. Back on the Q-boat a British captain brought Phineas Pinkham to his cabin.

"Jolly well done, old chap," he exulted. "Have a jigger of brandy, eh what?"

"I'll have four," replied Phineas, depositing his feet on the skipper's mess tale. "An' would you mind lookin' to see if I've got fins on me someplace? Haw-w-w-w-w! I'm awful sick of water."

"Everybody's been looking for you, Pinkham," the British officer went on, grinning. "Going to court martial you. Stealing a British seaplane and all that."

"What—again?" drawled the culprit. "Where're we headin'?"

"Dunkirk," replied the Britisher. "Adoo, then," yipped Lieutenant Pinkham. "Just give me a small boat with water an' provisions. I should make the Canary Isles by sundown."

"I've wirelessed the British Admiralty," the officer said, pouring Phineas another snort. "He'll relay the word to Admiral Simms of your Navy, Leftenant. Looks like you'll get a pot of medals for this. Ha, I've heard of you, Pinkham—what you've done in the air. Now it's on the water. Ever think of trying the trenches?"

"It's too confining there," Phineas replied. "Haw-w-w-w-w!"

Two hours later, on the drome of the Ninth Pursuit Squadron, near Bar-Le-Duc, Major Rufus Garrity came out of the Operations office and looked at his pilots. They were gathered around the mess table.

"They've got Pinkham," he said.

"Well, he couldn't last the way he was goin'," Bump Gillis sighed. "Gosh it'll be dead around here but I can catch up on my sleep. That's somethin'."

"Too bad, yeah," agreed Howell. "Maybe the poor guy was really goofy."

"But," Garrity informed them, drop-

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ping into his chair like a limp rag, "He captured Kapitan Poison and his U-boat. Went fishin' in the North Sea in a Limey seaplane. Hooked the sub. Said to tell us he did it with a picture book. Anybody here want a drink?"

"I need a bottle of it," Captain Howell exploded. "How long do you think the Kaiser will be safe from that speckled crackpot?"

"I would hate to be in his shoes," the

Major gulped and sent Glad Tidings Goomer, mess attendant, upstairs for four bottles of brandy.

Messages of congratulations came in from every corner of the war compass, but the members of the Ninth got to the point where they could not even answer the 'phone. When the Wing Commander arrived, he was unrecognized. The personnel of the Ninth were boiled right to their scalps.

## Photo Models in Movie Settings

(Continued from page 39)

but at this slow shutter speed you will have to place the camera on a tripod or something solid in order that there will be no movement of the camera when you snap the picture. With a box camera, you will have to make a short time exposure.

It is advisable to take several pictures at different angles. The one you think is the best can be enlarged to hang on the wall in your room.

Of course, all sorts of scenes are possible. Why not lay out a tiny lake along-

side a miniature farmer's field, put in a rustic fence made out of matches, and then "spot" one of your land plane models on the field? It would make a snappy "set." And you can build model hangars, too, such as the one beside which Albert Juhn photoed his model of Rick-enbacker's Spad, shown on page 27 of the September FLYING ACES. In short, there's an infinite number of settings possible.

You say, you've now got a "set" in shape? Okay! Camera!

## The Nieuport Delage 580

(Continued from page 32)

display only and tissue for the builders wishing to fly the ship. In both cases, be sure you dope the covering until a tight covering without wrinkles has been obtained.

The wing is made next. Notice that the wing is made up of four pieces with a dihedral rib fitted in the middle of the center section. Plates B and E show the wing and center section. Make the ribs of 1/16" sheet balsa. The leading and trailing edge is made of solid balsa. The cross sections are shown with each rib. Before gluing the leading and trailing edge on the ribs, I would suggest first gluing the 1/16" sq. struts into place. When all the struts or spars have been glued and the ribs are held together in place, shape the leading edge and glue in place. The same thing is done with the trailing edge. While you are waiting for the wing to dry, start work on the dihedral rib. This rib is shown on Plate D. The rib must be made of hard balsa only. You will notice that ribs K and J are alike. You will also notice that 1/16" sheet balsa plates are glued in the wing so that the N struts and wing struts may be glued on to the balsa plate instead of the wing covering. The wing tips are made of bamboo and are the last thing that is fitted to the wing before covering it. You cover the wing with the same material as you have covered the tail. After doping, allow to dry before assembling the four separate units of the wing as one. When the wing is being assembled as one unit, fit the dihedral rib in the center section and be sure that you have 3/4" dihedral at each wing tip.

### LANDING GEAR AND STRUTS

NOW that you have completed the body, tail surfaces and wings, start work on the struts and landing gear. Plates C, D, and E give all the information needed for making the struts. Notice that the thickness of the struts varies from 3/32" to slightly over 1/8". Be sure that you are using the hardest balsa obtainable—else you may be sorry you didn't after your model comes in for a landing. When the desired lengths have been cut for each strut, streamline each one carefully. The N struts may now be assembled as shown on Plate C. Now that you have completed the struts, it would be wise to dope them. Now turn to Plate D and make the wire shock absorbers. Stick them into strut P, as shown in Plate D. Now that we have the wire handy, it is wise to make all the wire parts for the model. Plate B shows the prop shaft; Plate C, the rear plug hook and the tail wheel assembly; and Plate E, the S-hook.

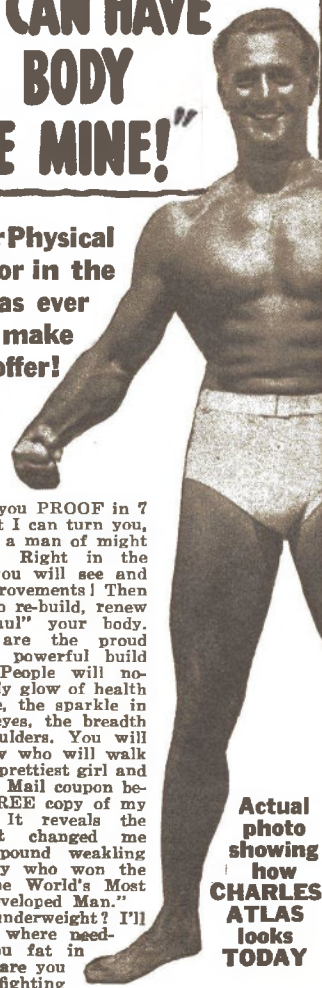
Our next step is to make the nose and tail plugs. Plates A and C show them. Note that 1/16" sq. strips glued on the plug prevent it from slipping in the socket. Be sure that the plugs are also of very hard balsa. The prop shaft and rear hook is now passed through the plugs.

Details such as machine guns may now be made and glued into place. The observer's guns are glued onto a small metal ring, as shown on Plate A. The ring is supported to the rear cockpit by 1/16" sheet balsa, as shown in the side view on Plate A.

If you are building the model for dis-

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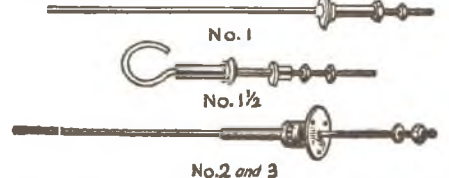
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11 "	30c	30c	45c
12 "	35c	35c	55c
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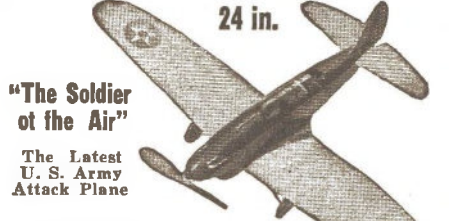
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play, make a scale prop. The diagram for such a prop is shown on Plate E. If you want the model to fly, make the flying model prop. This prop is shown on Plate F, with the top view on Plate E. The flying prop must be doped and finished with fine sandpaper before the prop shaft is passed through it and glued.

You now get a piece of celluloid and make the windshield. Note that the front part of the forward pit is made by the windshield. Next turn to Plate C and work on the support for the elevators. Notice that it is only a piece of 1/16" sheet balsa. When you have cut it out, glue it on the fuselage, as shown on Plate C.

**ASSEMBLING THE MODEL**

**C**EMENT the tail surfaces to the body, making sure that the rudder is vertical and the elevators horizontal. Now glue the N struts on the fuselage, as shown. When this is done, glue the wing on the struts and cement the wing struts shown on Plate E into place.

The tail wheel is next in line to be attached to the fuselage. The landing gear is then assembled and glued to the ship, and after the plugs have been slipped into place you have completed your model. Wheels must be of celluloid if the model is to be flown. Standard rubber tired wheels may be used if the model is for display.

**COLORING**

**A** GOOD color scheme would be olive drab and yellow, with the regular red, white and blue insignia of France, and white lettering, on the side of the fuselage. Machine guns and all struts should be painted black. Wings and tail must be painted yellow, while the

fuselage is olive drab. The propeller will look good painted silver, with red, white, and blue stripes on the tips.

The lettering may be painted on free hand or with stencils. For best results when painting, sand the model with fine sandpaper between each coat. A coat of clear lacquer will help you get the desired finish if you wish the model for display purposes.

Builders who wish to fly the model and want to avoid all possible excess weight need not paint the model but only add the insignia and the black trimmings. They will be surprised to see that their model, even when not painted, will look trim and neat.

**FLYING THE MODEL**

**F**OR motor power, use only four loops of 1/8" flat rubber. Apply glycerine over the rubber surface. Always stretch the rubber before winding.

It is always safe—and wise—to glide the model a few times before allowing it to fly away under its own power. While gliding the ship, you must try to discover any tricky characteristics in the model. If any such characteristics exist, they must be overcome before it is safe for the model to take the air under power.

When the eccentricities have been abolished by warping the tail surfaces, wind her up and let her take the air. Make sure you always head the nose of the ship into the wind with every take off. I would advise examinations of your ship after each flight. In this way, you will often uncover frailties before they cause a crackup. Your ship will have a longer life and will give you many added hours of flying enjoyment.

Now get out your tools—and good luck!

## Make the Boeing Bomber

(Continued from page 40)

until all are finished, after which each piece should be coated with dope, as explained above.

Now cut two slots in the tail end of the fuselage, one for the rudder fin and one for the elevators. The one for the elevators should be cut through from one side to the other, but that for the rudder should extend only to the center and thrust lines of the fuselage. After this is done, place some cement in the cracks and slip the rudder and elevators in place, carefully lining them up at right angles to each other. Stick pins into the sides of each to hold them firmly in place while they dry.

Now go on to the wing and nacelles while these are drying. Trace the shape of each nacelle onto the wing in its proper place, then cut out the portion of the wing into which each one will fit. When through, cement-in all the nacelles and allow to dry. Now cut the wing along the top center line from leading to trailing edge to get dihedral, tilting the tips upward and holding them in place with blocks. When the

cement on the wing and tail has dried thoroughly, cut out a portion of the lower side of the fuselage at the point where the wing will be fastened. The depth of the cut should extend to just below the center line of the fuselage. Next, take the piece out, cement-in the wing, and then slip the fuselage piece back, cementing it in likewise. Stick pins in, to hold both in place and allow to dry. Now mix some balsa dust and aerodope and apply it into the crevices of the engine nacelles and wing, and lower side of fuselage, let dry, then sand it down smooth and to the shape of a fillet on both sides of each nacelle.

To make the motors, you can either build them up, use cast motors sold by supply houses, or cut out four silhouettes of stiff paper, painted black, and paste to the front of the cowls. Cement the cowls in place, then go on to the landing gear. This can be made of bamboo, metal rod, tubing, or birch dowl. Make it as shown in front and side views. Then fit a wheel into each



gear and fasten it to the fuselage.

The tail skid can be made by crushing one end of a piece of brass tubing, bending and cutting it into a fork shape to receive the wheel. When finished, slip it in place.

Make the pilot's pit next, as shown in the drawing, and cement in place. For wind shields you can use celluloid or merely paint them in on the wood. The front gunner's pit can be made from two gelatine capsules, a small one for the up-right "cage" and a large one to form the shape of the fuselage nose. The four gunner's "blisters" may be shaped of soft balsa and dowed into the fuselage. But be sure they fit the body snugly.

PAINTING

To paint the model it is best to use brushing (fast-drying) lacquers. The colors of the ship are regulation Army colors—khaki fuselage and landing gear, with wing, vertical fin, elevators, and stabilizers in yellow. The markings are regulation U.S. Army—white star with red center, and blue field. Tail strips are red and white horizontals and blue vertical bar, as shown in side view.

Lots of luck, model builders—and let's see which one of you comes through first with a picture of his Boeing Bomber for our "With the Model Builders" page.

Clark R.O.G. Tractor

(Continued from page 36)

cover both sides with the silk tissue, using the banana oil to stick the covering to the frame.

Trim the edges with a razor blade and lightly sand away the paper on the leading and trailing edges where they will go against the body. Cement the tail to *a* in the recess already provided. Be sure the tail is exactly square with the stick, both in end and plan views. When it has set, spray water lightly over the surfaces, both top and bottom, with an atomizer—a ten cent store bug sprayer will do. This is advised for all the surfaces, as dope might warp them.

Build up and cover the fin and rudder in the same way, and cement the fin in place as shown on Plan No. 2. Take pains to have it as nearly perpendicular to the tail as possible, not canted to one side or the other.

Form the tapered rudder bar, *j*, then carefully push it through the covering and cement it in place on the rudder as shown. See that it is centered and squared up before the cement sets.

Slightly round off the edges of fin and rudder that hinge together and run a fine needle carrying thin strong thread, through these balsa edges at the points shown, for hinges. Tie the thread hinges securely. Cut a slight notch in the leading edge of the fin at the point *x*, and run a piece of thread over this notch and out over the ends of the rudder bar and tie firmly at the trailing edge of the rudder, while it is slightly turned to one side, so that it will be tighter in position when in line with



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the fin. Apply a bit of cement at each end of the rudder bar and where the thread is tied to the back of the rudder. Do not apply cement at the notch in the leading edge of the fin.

WINGS

CUT out the ribs and the end pieces from the 1/32 and 1/16th sheet balsa pieces with a sharp razor blade. Notch the ribs onto the 1/16 x 1/8 center spars, after marking off on the spars the location of the ribs. One wing at a time jig all the parts as was done with the tail units and cement the leading and trailing edges to the ribs, the ribs to the spars, and the end piece to the edges and spar. Be sure to make one left and one right wing and note the slope that the end or root rib at the inner end of each wing is given to provide the necessary dihedral angle when the wings are cemented to the angle of incidence block, *k*. Note also the exact angle the wings make at *a-1* (Plan No. 2).

The incidence block, *k*, is built up of 1/32 sheet cemented to the sides of the 3/16ths square by 2 1/2 wing center piece, after tapering this piece as shown. The bottom edges of the root ribs are cemented flush with the sloping bottom surface of the block to provide the 2-degree constant angle of incidence setting when the wings are on the plane. Dampen the wing surfaces lightly with water to make them taut as was done with the empenage. (Note: Care should be taken to see that each wing contributes the same amount of upward angle on each side to make up the total dihedral angle.)

PROPELLER

FIRST shape the blank, *m*, as shown on Plan No. 1. This shaping before carving is important, since it provides a true-pitch propeller of correct design for this ship. Next carve out the blades and sand down to the thicknesses as shown at points *n* and *o*, making the blades gradually thicker as they approach the hub. Form the propeller shaft, slip on the washers, and assemble to the propeller as indicated, after putting a true hole through the hub and cementing one washer to the rear of the propeller. Work the hook-end of the propeller shaft through the front of the hanger and assemble the rubber motor of two strands. The rubber is strung between the hooks so that it is just under tension.

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Kits for all model guns 50c up.

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**PRINTING** Balsa Wood, \$1.40 per M. Prices on larger quantities upon request. Plans printed, catalogues printed, etc. Airport Printers, 126 Weyman Ave., New Rochelle, N. Y.

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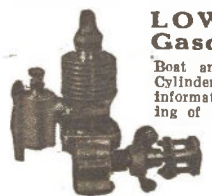
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**POWER MODEL BOAT & AIRPLANE CO.**  
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The wing is held in place on the motor-stick with a light rubber band. (Note: Two coats of banana oil will greatly strengthen the propeller. Sand lightly between each coat and after.)

If the machine fails to climb, move the wing ahead slightly; if it stalls, move the wing back. Adjust an eighth of an inch at a time until perfect flights are secured.

The use of a winder and lubricant upon the rubber will insure longer and better flights. If a winder is used, an

S-hook must be provided, the rubber being run through one loop of the S-hook while the other loop hooks onto the eye or hook of the winder and onto the tail hook. A good lubricant for the rubber motor is one part glycerine, two parts soft soap, and four parts water, boiled up until the mixture has a syrupy consistency. Apply the lubricant to the rubbers just before each outing with the machine.

Good luck, all you tractor fans, and many happy flights!

**Flying Aces Stamp Tales***(Continued from page 77)*

stamp presents a more modern version. The monoplane is frightening a spirited team of plow horses held by a pair of rather inadequate reins. But that was 1925. Today, those same horses would not even deign to look up at the air mail pilot.

In winding up the heavier-than-air-machines, the colorful Egyptian commemoratives, issued in connection with the 1933 International Aviation Congress held in Cairo, present two modern types of ships. The "5 Mills" value portrays a British transport monoplane. The "13 Mills" value depicts the giant Dornier Do-X.

In the field of lighter-than-air craft, we have room to show only three stamps. These, however, are representative high-spots.

The Soviet proudly issues a miniature of the Slavic adaptation of the Zeppelin. Nearly every country issuing air mail stamps has honored the Zeppelin either by picture or name on special stamps—for the Zepps have toured the world. The aero-philatelist who wants to specialize can even limit himself to Zepp-adhesives. But he had better first make sure he has a well-stuffed pocket book, for some of these stamps come so high we are tempted to spell Graf with a final "t."

Finally, we shall go up in the air and more than hit the "ceiling"—into the stratosphere with Monsieur Piccard *et al.* Belgium, in 1932, issued a commemorative Piccard series in red brown, dark blue, and dark violet. These stamps sold for 75 centimes, one franc 75 centimes, and two francs 50 centimes. Part of the proceeds from the sale of these stamps was devoted to a fund for National Scientific Research. A beautiful picture of this odd pear-shaped gas bag with its cylindrical observation cab was used as the central design and the stamp gives the dates of Prof. Auguste Piccard's two ascents as "27 V 1931" (May 27th), and "18 VIII 1932" (August 18th). But Belgian pride in a Swiss scientist's exploit was short lived, since in 1933 Soviet Russia brought out a series of larger stamps in keeping with their greater ascent. And then, that there might be no misunderstanding, not only did they show the later date of "30 IX 33" (September

30th), but they also recorded the height—"19,000 m" (approximately thirteen miles).

Since then, the history of stratosphere flights has been continued through the medium of other postage stamps, as told in last July's FLYING ACES. You will recall that another Russian stratosphere attempt was credited with an unofficial height of 22,000 meters. The ill-fated pilot, observer, and radio operator were honored posthumously.

In this philatelic air pageant, it is amusing to find that long before there was regular air mail, Japan, of all nations, was so prophetic as to insert four little balloons in the respective corners of a 12 sen stamp issued in 1876-77. That, we believe, is the earliest that a postage stamp bore such an allusion. We might have expected some of the more air-minded nations to tell Dai Nippon to "go fly a kite."

In 1897, the Chinese Imperial Post issued a \$1 stamp that featured a wild goose. Thereby hangs an apocryphal tale. It seems that a gang of brigands captured a loyal subject of a Chinese ruler. The kidnapped one contrived to write a letter and fasten it to the leg of a wild goose. Thereafter, by strange coincidence, the royal potentate was out hunting and (believe it or not) shot the letter-bearing goose. Thus was the first air mail message specially delivered at his very feet.

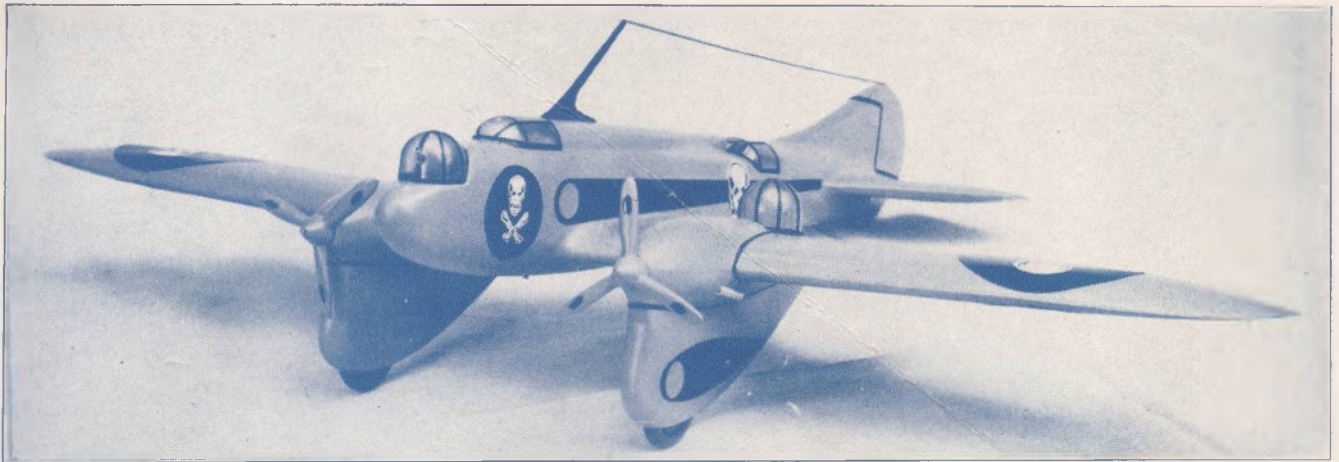
We must believe the story, for we have the stamp picturing that *very* wild goose. The date of this unofficial flight is lost in antiquity—but it was many cycles in Cathay before the siege of Paris in which out bound mail was sent via balloons and returned by homing pigeons.

History is still in the making. Only recently, Cuba issued special stamps depicting a plane-train flight in which a powered plane towed several gliders, dropping these motorless units one by one en route. And rocket posts, now in the experimental stage, already have been cited on special stamps issued in Italy, Netherlands (Holland), England, and Germany.

Next month, myths and fables featured on air mail stamps will be described and illustrated.

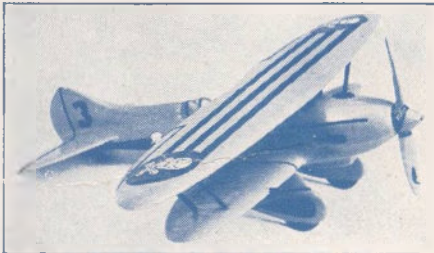
The Talk of the Model World!

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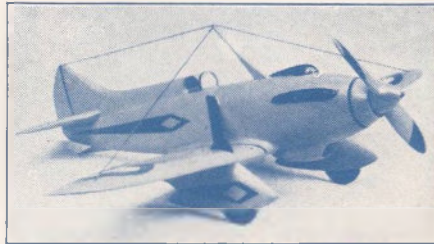


## SUPER CHROME BOMBER M-21

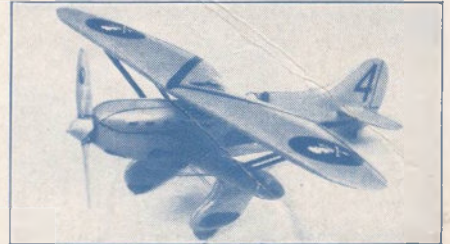
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Contain all cut to shape wood parts, finished cast prop., rubber tired wheels with cast hub, sandpaper, insignia, detailed plan, straightened steel flying wires, celluloid, turned cowl (where needed), 4 bottles lacquer, balsa motor, cement, aluminum tubing for exhausts, sight and guns, radiator screening, cockpit tubing, and special instruction sheet.

- |                   |                               |
|-------------------|-------------------------------|
| 15-3/4" Hawk P6-E | 15-3/4" Curtiss Goshawk       |
| 15" Boeing F4B-4  | 14-1/2" Northrop Fighter FT-1 |
| 14" Boeing P26A   | 14" Grumman Fighter F2F-1     |
| 15" Boeing P12-E  | 15-1/2" Waco D. Pursuit       |
| 13" Boeing P29    | 15" Hawker S. Fury            |

**\$1. ea.**

plus 15c postage

### 1/4" Scale Kits

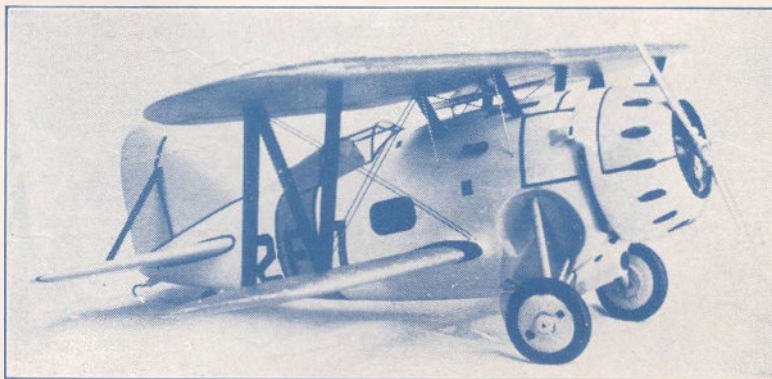
contain cut to shape wood parts (body, wings, tail, etc.), pine struts, cast prop-pilots—guns—and individual motor—where needed, rubber tired wheels, detailed plan, straightened steel flying wires, sandpaper, insignia, celluloid, cement, wood filler, colored lacquers, tubing, special cockpit tubing, special high gloss clear liquid, and special instruction sheet.

- |                        |                            |
|------------------------|----------------------------|
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| 8" Vickers Jockey      | 6-3/8" Boeing P29          |
| 7-3/4" Waco D. Pursuit | 7-3/8" Berlin Jovee P-85   |
| 7-1/2" Hawker S. Fury  | 7-3/8" Hawk P6 E           |
| 9-3/4" Curtiss Falcon  | 7-1/8" Northrop Fighter    |
| 9-1/4" Consolidated    | 11-1/4" Douglas Y-10-43    |
| 8-1/2" Grumman 2-place | 8" Chrome Fighter M-23     |
| 7" Grumman 1-place     | 8" Chrome Pursuit M-23     |
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**50c ea.**

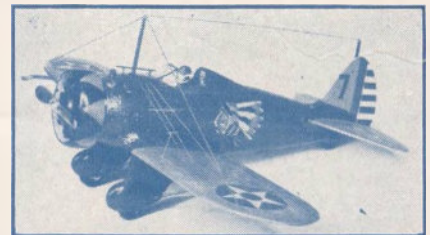
Plus 5c postage, except Bomber which is \$1.00 plus 15c postage. Any 4 except Bomber, \$1.50 plus 15c postage.

Canada and British Isles customers add 10% to these prices, all other foreign customers add 20%.

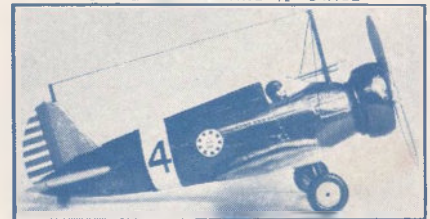


NEW GRUMMAN SINGLE-PLACE FIGHTER F2F-1

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BOEING P26A 1/4" AND 1/2" SCALE



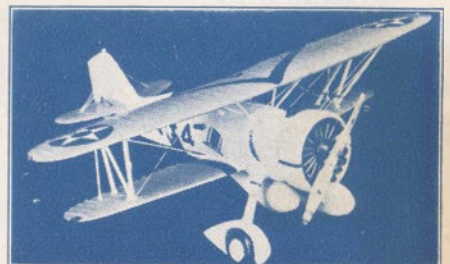
BOEING P29 1/4" AND 1/2" SCALE



WACO D PURSUIT



NORTHROP FIGHTER FT-1



CURTISS GOSHAWK F11C2

Send all orders direct to LEWIS MODEL AIRCRAFT, 2210 N. Lombard Avenue, BERWYN, ILLINOIS

# "Hi there, PIMPLY FACE!"



**But soon  
... they  
changed  
this ugly  
nickname**



**Don't let adolescent  
pimples brand YOU with  
a hated nickname!**

Between the ages of 13 and 25, important glands develop. This causes disturbances throughout the body. Waste poisons get into the blood and irritate the skin, making it break out in pimples.

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*—clears the skin*  
by clearing skin irritants  
out of the blood