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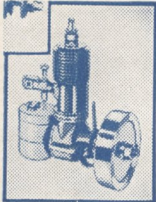
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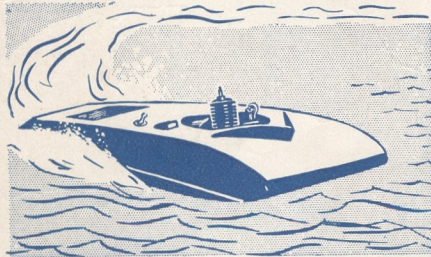
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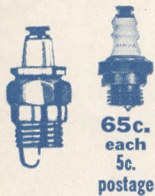
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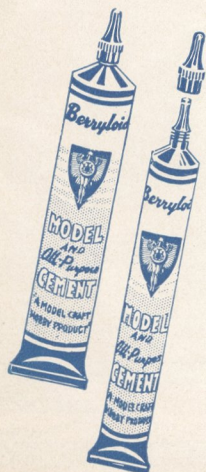
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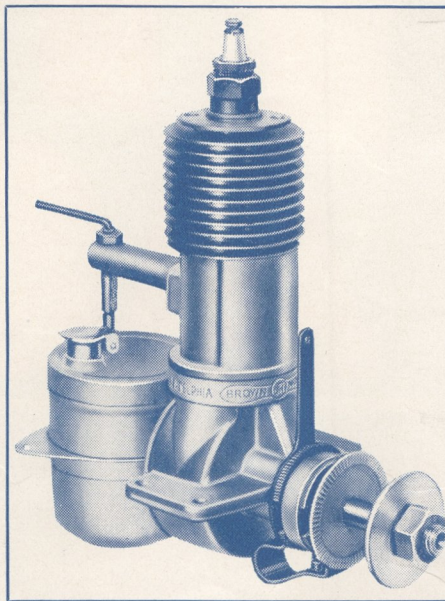
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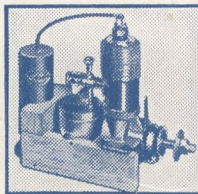
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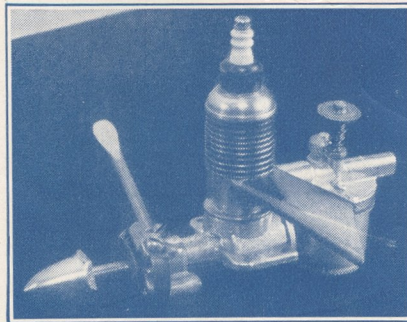
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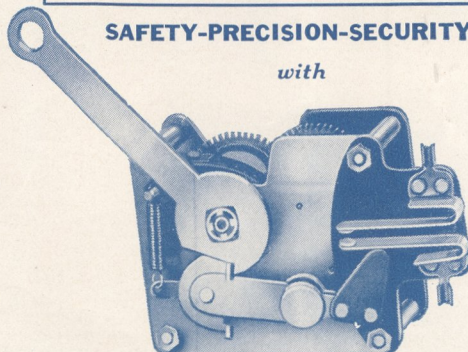
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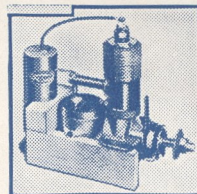
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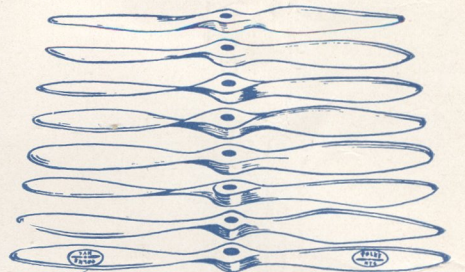
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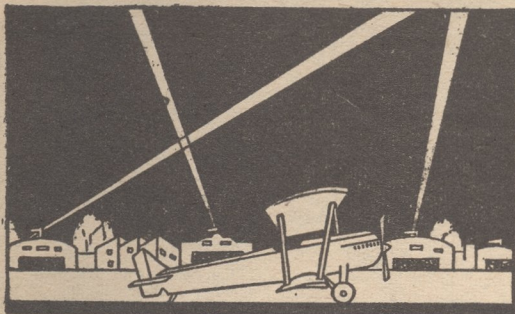


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VOLUME XXIX

JULY, 1938

NUMBER 4

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Hell's Hangar

By Donald E. Keyhoe

Author of "Pirate Squadron," "Vultures of Silence," etc.

Illustrated by Jon L. Blummer

CHAPTER I

DEATH RIDES THE DEWOITINE

IT COULD have been a tomb—that strange, paneled room buried deep in the ground "somewhere east of Luxembourg." A death-like hush pervaded it, save for the jerky breathing of the square-headed colonel in one corner.

The other man in that room hardly moved, hardly drew a breath. His pale, gaunt figure might have been a corpse propped stiffly behind the great desk, glassy eyes fixed on the huge wall-clock.

Like a long, bloody dagger, the red second-hand once more traversed the clock's dial. As it reached the sixtieth second point, the eyes of the gaunt German lit with a fanatical glow.

"Five minutes!" he whispered. "Think, Moltke! Only five more minutes, after all these years!"

The color went still farther out of Moltke's fat face, and he stared in fascination at the dagger-like hand.

"Ja, General Hiede. I am thinking! But what if it should go wrong?"

"You white-livered *Dumkopf!*" the general said with contempt. "No one else knows of it—only you and I. Even after I give the signal, word cannot reach *der Fuehrer* or that lummox of a Goering within anything less than four hours. I have seen to that. And by that time, they can do nothing but—"

He broke off as a muted buzzing came from a spot on an enormous wall map of Europe which hung directly opposite the big desk. A tiny green light flashed out a swift code signal, then burned with a steady emerald glow. Hiede inhaled sharply, stabbed a look at a photostat chart which lay before him. His bony finger traced down to the word "Paris," and across to one of several numbers bracketed with it.

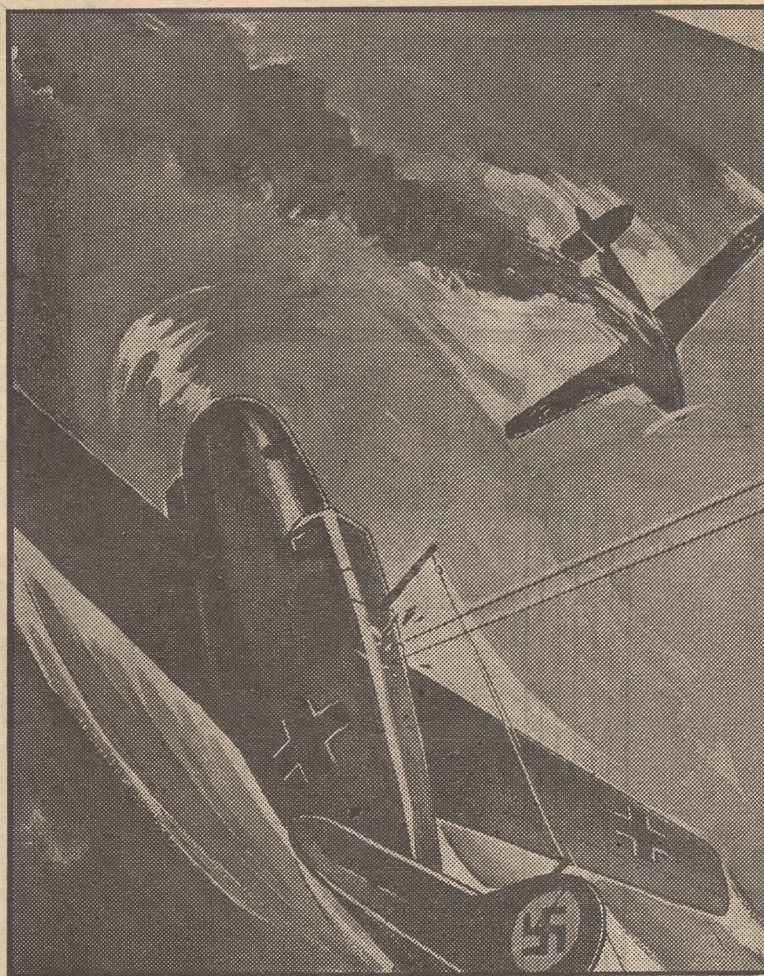
"Von Lehr's signal! We are ready!"

Drops of perspiration stood out on Moltke's square, fat face. He reached toward a phone, took it up in shaking fingers.

"*Herr Kommandant,*" he said hoarsely. He gulped, had to force himself to go on. "It is—it is the time."

"*Sehr gut!*" an answer crackled from the receiver end

Dick Knight settled comfortably in his cockpit. Save for some strange, organ-like trills that had sounded from his radio, the flight had been uneventful. But Dick Knight did not know that those weird tones he had heard were the ominous notes of an overture to a drama of death. Nor did he know that just five minutes before, a gaunt Prussian, with feverish eyes on a black clock, had whispered: "Five more minutes! Only five more minutes to wait after all these years!"



of the instrument. There was a brief pause, then something like a muffled explosion sounded over the wire. A roar followed, quickly lessened in volume and died out. Moltke put down the phone.

"*Gott help us!*" he mumbled.

"Stop blubbering, you fool," Hiede bit out harshly. He stood up, an amazingly tall and skinny figure, his major-general's uniform flapping like the clothes on a scarecrow as he strode across the room. He pressed at the side of a panel, and it moved sidewise, revealing a steel door two feet square fitted with a dial-lock similar to that of a bank vault. His long fingers spun the knob, and the door opened to reveal a compact switchboard with numbered and lettered buttons. He threw in a master switch at the top, then methodically began to press the buttons. As he finished with the last, his feverish eyes briefly rested on a small single-bladed switch at the bottom. It was secured with two separate locks which kept it from being closed.

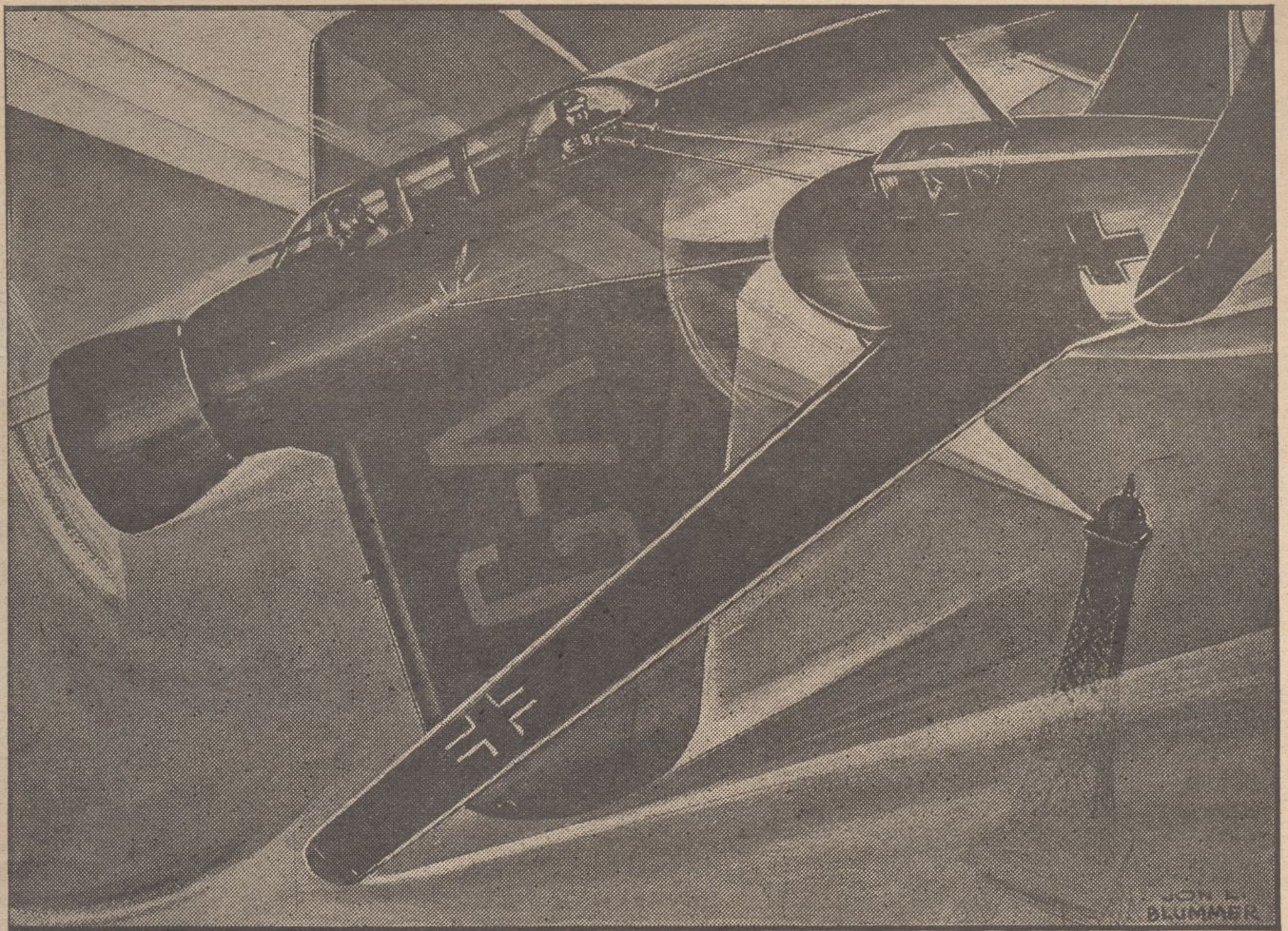
"Give me the other key," he snapped at Moltke.

The colonel's jaw sagged.

"But—but you have barely given the stand-by signal!"

"They will have enough time," grated Hiede. "I will not follow through until the hour we planned. But I'll take no chances on your suddenly changing your mind."

MOLTKE took a key from his wallet, dropped it on the desk. The general pocketed it, closed the steel door. By now, colored lights were beginning to flash at several points on the huge map. Hiede checked each one with the photostat, occasionally referring to a red leather book in which names and num-



Doyle swung his twin-mount for a death blow. But the Messerschmitt pilot did not hesitate. He plunged in recklessly, his guns hurling blazing tracers that tangled with the fire of the ex-Leatherneck.

bers were entered with a paragraph after each entry. In ten minutes, all but five of the bulbs on the map were burning steadily.

"The others will come in soon enough," Hiede said, half to himself. He looked at the clock. "Switch on the amplifier and make sure that von Lehr is on the right bearing."

Moltke bent over a box with wires plugged into the wall, and in a moment a series of high-pitched signals became audible. There was something oddly harmonious about them as they blended in a chord, then sounded separately and blended again like the bells of a carillon or the high notes of an organ.

"Beautiful, *nein?*" Hiede said with his hatchet face grimmer than ever. "A pretty little song, eh, Moltke?"

The squareheaded colonel managed a ghastly smirk. "Very pretty, *Herr General*. But what if some one heard and suspected—"

"For the hundredth time, I tell you it's impossible!" rasped Hiede. "My agents checked every country in the world, and there has been only one other such set built."

"But you told me there was *none!*" Moltke said in dismay.

"That one was destroyed," retorted the scarecrow German. "It was built by the radio engineers of the United States Army for that spy-devil who caused so much trouble in Spain and in the Mediterranean two months ago."

"You mean the one they call 'Q'?" exclaimed Moltke. "*Mein Gott*, if he should find out—"

"What could he—or any other man—do in three hours? And as I told you, his set was ruined. I have a

complete report. It was installed in a special Northrop which was built for stratosphere flight. Also, my agents finally discovered the identity of this *verdammt* Q-agent. His name is Richard Knight, and he poses as a wealthy sportsman pilot. But his money comes from the secret counter-espionage fund of the United States, and his companion on his travels is a former Marine Corps pilot named Lawrence Doyle—a fellow who was discharged from that service after being entangled in a battle with Jap flyers in China. They work with various civil departments of their Government, as well as with the Army and Navy, so you can judge the power they have."

"But this ultra high-frequency set?" insisted Moltke.

"It was destroyed when they made a forced landing at Guam after that rocket affair we heard of in Manchukuo. Knight and Doyle left there by Clipper, and my men lost them at Singapore. They are probably back in the United States now."

Moltke exhaled a sigh of relief, sat down, and again watched the lights on the map. Two more had flashed up, one of them at a point marking Le Bourget Airport, just north of Paris. A third, near London, was flashing a brilliant purple when suddenly the sweet harmony from the amplifier was broken by a staccato, rasping signal. Both Germans leaped to their feet.

"Von Lehr!" cried Moltke. "Something must have gone wrong."

"It can't be von Lehr!" snarled the general. "He'd have to switch off his automatic transmitter, and you can still hear the chimes."

For almost a minute, the discord continued. Then there was an interval, following which the mysterious

A STIRRING RICHARD KNIGHT SKY ADVENTURE

new signal came through again. Hiede clutched the direction-finder knob of the high-frequency receiver, frantically adjusted it until the signal all but drowned out the bell-like tones.

"*Du Lieber Gott!*" he said furiously. "It has twice the volume! Do you realize what will happen?"

Before Moltke could answer, the rasping signal ended and a voice spoke, deep in tone, and with a guarded inflection—

Q to W-A-R . . . Q to W-A-R . . . If new code, have not received key. Please shift to Code F. Shift to Code F. Go ahead W-A-R.

Hiede sprang for the phone, his gaunt face livid.

"*Kommandant!*" he rasped. "Order three of the 109's started for emergency flight. I'll be there to give the full instructions in a minute."

"*Herr General!*" Moltke said wildly. "I don't understand! Who is W-A-R and what—"

"W-A-R is the United States Army station at Washington," Hiede flung back as he started for the door. His sunken eyes held a maniacal glare. "Those damned agents of mine have been tricked! If that Q-agent isn't found—and that set destroyed in thirty minutes or less—we're lost!"

The door boomed shut behind him.

Moltke, his fat face ashen, continued to stare at the amplifier. But the voice remained silent, and only the sweet harmony of the chimes came to his ears. He shivered as he thought of what that music meant.

* * * *

THE FOG now seemed to be slightly less thick, for the wingtip lights of the speeding Northrop again showed plainly. Dick Knight looked thoughtfully into the murky gloom ahead, then cut in his gyro-pilot and lifted his long legs from the rudder pedals.

"Try it again," he said over his shoulder.

Larry Doyle bent his chunky figure and switched on the special spy-set which had been built for their use in counter-espionage. After a few seconds a clear, sweet harmony came from the tiny speaker-box in the front cockpit.

"There she is," grunted Doyle. He rubbed his crooked nose with the back of his hand. "Hanged if I can make it out. Brett never said it with music before."

"It's not coming from Washington," said Knight. His eyes, so darkly blue they appeared almost black, rested for a second on the bearing indicator. "Whatever it is, it's coming from the heart of Paris—if my dead reckoning is anywhere near right."

"Where are we?" demanded the ex-Leatherneck.

"Just about over Versailles, I think. The wind may have changed since we swung in from St. Nazaire, but the last bearing I took on the Le Bourget beacon shows we're just about on course."

"I still think we should've pushed through to London," grumbled Doyle. "Here we go to all the trouble of hopping across Spain, with both sides ready to smack us in the klink if we get forced down there, and then a water-jump over the Bay of Biscay. And now you go chasing bells!"

Knight chuckled. "Don't worry, Lothario, that girl up at Croydon will wait another day. And then there's always Paris."

"You know I can't talk Frog worth a nickel," retorted Doyle.

"I thought," Knight said with a grin, "that you lovers had a universal language."

"Go sit on a prop," snorted Doyle. "Say, those bells are getting louder."

The taller secret agent leaned over the bearing indicator, then switched off the gyro and took the controls.

Without lowering the special retractable landing-gear, which with a souped-up twin Wasp enabled the Northrop to show a top speed of 365, he nosed the spy-ship downward.

"What's the idea?" said Doyle.

"I'm going to see if we can break through this stuff and find where that chimes signal is coming from."

BLURRED LIGHTS began to show beneath, and the fog masses took on a whitish glow, indicating a city of considerable size below. Knight leveled out at 1500 feet. The mysterious chimes grew steadily louder, and in a moment he switched on his transmitter and held the hand-mike to his lips.

"Q calling in—Q calling in," he said crisply.

"I thought you said it couldn't be for us," cut in Doyle.

"Might be some one from G-2 with a special mission—some fellow using one of those portable sets," Knight said, his thumb on the mike circuit-button. Then, when he had barely switched back to the receiver, a voice spoke with a note of frantic haste—

W-A-R to Q. Don't send any more. Land at Le Bourget and wait for contact!

Knight's eyes narrowed, for the voice had a foreign inflection, although the words were English. He threw the sending switch.

"Who's calling? Give your identification number. And who am I to contact at—"

"Dick, look out!" shouted Doyle.

Knight sprang up in his seat. A giant Dewoitine airliner was plunging head-on out of the fog!

He gave a desperate jerk at the stick and stood on the left rudder pedal. Thereupon, the Northrop screamed up into a skidding split-turn, wingtip almost scraping the French airliner.

"The crazy fools!" howled Doyle. "Not a single light showing! Let's get out of here!"

Knight stared down into the mists. Against the glow of the city lights below, the Dewoitine was darkly silhouetted. It was turning back toward them, starting into an upward spiral. From its size, Knight knew it must be one of the thirty-passenger jobs used by the Air France Company.

"What the devil do they want now?" yelled Doyle. "Look! They're chasing after us!"

Knight turned on his landing lights, swung the controlling grip so that the beams focussed slantingly on the big ship. Faces showed at the windows of the climbing airliner. And a cold chill went over the American when he saw them. There was something horrible about those faces—a queer rigidity, a total lack of expression as though—

"Good Lord!" Doyle burst out. "They're dead! Even the pilots!"

Knight froze. Yes, the pilots, too, were sitting rigidly in their seats, unmoved by the glare of his lights. But the Dewoitine continued to zoom straight for the Northrop!

CHAPTER II

ENTER CAPITAINE ROBARD

WITH a jerk at the stick, Knight pulled up over the Dewoitine, then pivoted into a vertical bank. The big airliner settled into level flight, and he cautiously edged in alongside. The glow from the Northrop's wing-lights reflected from the fog back into the cabin. He stared across, through the Plexiglass enclosure of his cockpit. The passengers were still sitting there, motionless, their faces oddly waxen.

And then the truth burst upon him. "They're wax dummies!" he exclaimed.

The Dewoitine swerved abruptly, and he had to kick into a hasty skid to avert collision.

"Maybe they're dummies," howled Doyle. "But there's somebody on board workin' those controls."

"I'm going to slide in close again," clipped Knight. "Watch the cockpit—there might be some one crouched

(Continued on page 54)



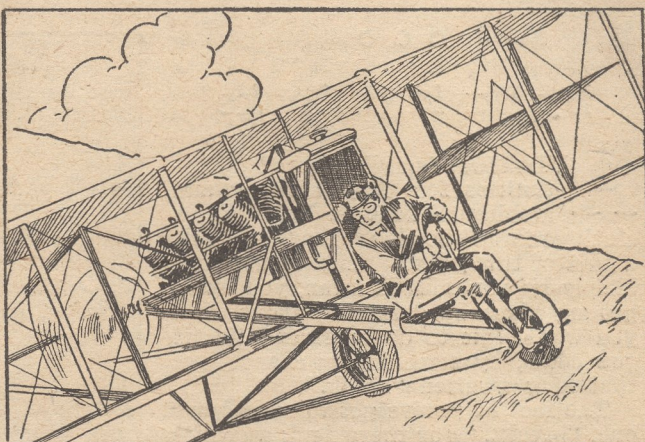
They Had What It Takes

XVIII—GLENN L. MARTIN—CLIPPER BUILDER

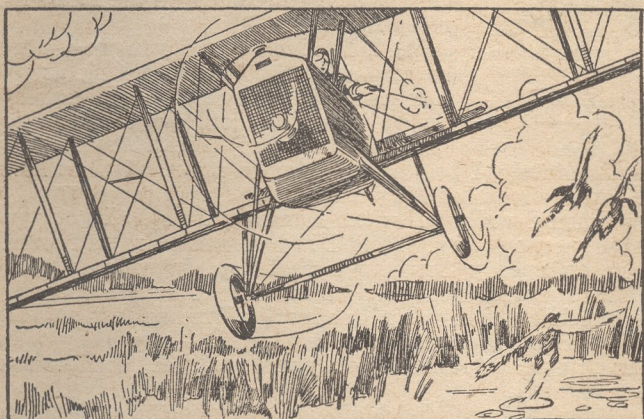
By ALDEN McWILLIAMS



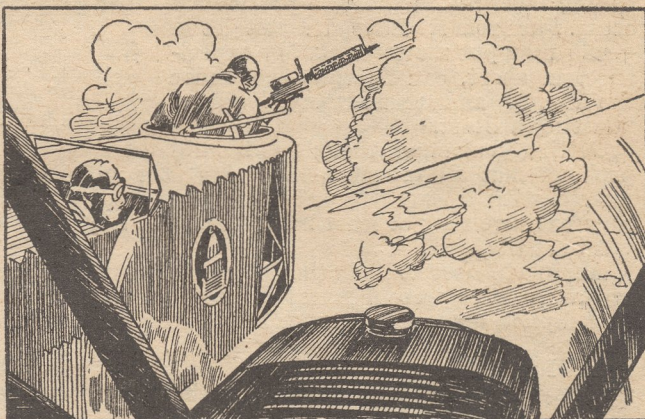
1—The son of a hardware dealer, Glenn L. Martin was born in Macksburg, Iowa, in 1886. Shortly thereafter, the Martins moved to California where, following high school training, young Glenn worked in a garage. However, birds and their flight were Glenn's real interest; and later, when he became an auto salesman, he studied aviation in his spare time.



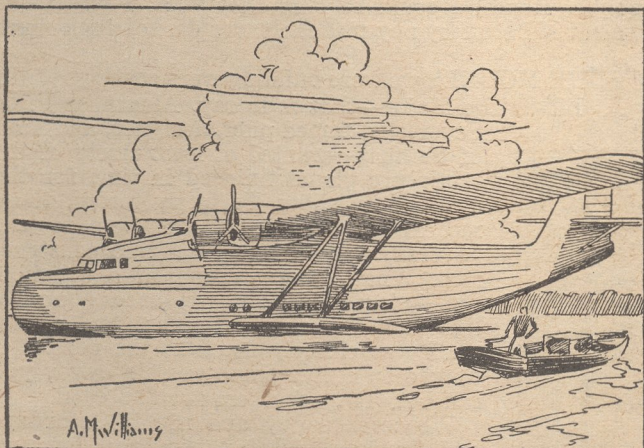
2—Then in 1907, after making a few gliders, Martin built a pusher-type plane, taught himself to fly, and participated in the first Pacific Coast air show. And finding the public enthusiastic for sensational sky work, he continued to race and stunt as a means of getting money—the money he used, in 1909, to found one of our first airplane factories.



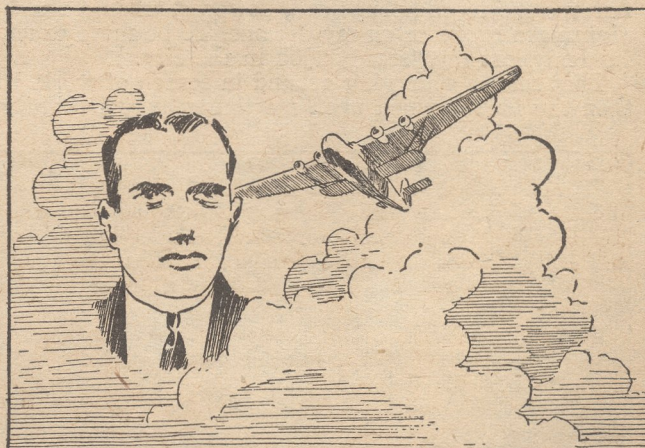
3—Progress being gradual, Martin went on with his racing, usually placing first or second in the meets. He also made sport use of his craft, hunting while flying near the ground. Then 1915 saw him in an early aero movie with Mary Pickford. And next, after a short association with Orville Wright when we entered the War, Martin set up shop in Cleveland.



4—Reception, in 1918, of a 24-plane order from the Netherlands constituted a great step forward for the famed builder. And in the same year, he completed his first huge Martin Bomber, a number of which were bought by the U.S. Slack years followed. But Martin kept working, and the early '30s found him filling a new Government order for 83 war planes.



5—From his Baltimore plant there next came the great *China Clipper*; and when Captain Musick piloted this gargantuan craft across the Pacific in 1935, the whole world applauded. Sister ships quickly augmented this trans-ocean service. Then this January, Martin finished the largest flying boat ever built and flown in America—a 31½-ton plane for Russia.



6—A born designer and an astute business man, Glenn L. Martin has guided his company into the front rank of the world's builders of leviathan aircraft. And ever with an eye to the future, he is now planning to construct a startling 125-ton bomber—a mammoth ship which would carry a crew of thirty men and be capable of flying fully 11,000 miles non-stop!

With Seversky!

By David C. Cooke

AVIATION is full of swell opportunities for all you young and ambitious fellows, but it's a cinch you won't be able to make yourself a part of this grand and glorious game simply by dreaming. I mean, you won't get anywhere by dreaming about what you would like to do in aeronautics if you could, by some happy chance, get that long awaited "break."

The fact is, you've got to make your own "breaks." For there's not a chance in a thousand that an aero executive is going to come ringing your door-bell to make you an offer.

What did I do? Well, I'll tell you my story now. But don't get me wrong—it isn't an Horatio Alger success story ending with me in the vice president's chair. Far from it! Instead, I just got in—and they put me to work. My experience, in short, can be classified under the simple and unassuming head of "Getting a Start."

Getting your start, though, is the big problem that all you aero-hankering lads will have to wrestle with. So my detailed description of my own little adventure may at least help you to get some idea of what it's all about.

Anyhow, I used to be in the dreamer class myself. And my air castles were beauts! I imagined myself as a famed pilot, an applauded war ace, a designer of world-renowned speed planes, and what not. The dream in which I was the grand slam of the designing profession was my favorite. I spent my evening hours making sketches of startling sky busses which I proudly dubbed with such labels as the *Cooke Comet*, *Cooke Courier*, and *Cooke Conqueror*. But as I look back on it now, I realize that very nearly every one of my brain children should have carried the tag *Cooke Convulsion*.

Oh, maybe some of my ideas weren't too bad theoretically. But boy, were they fantastic! My sketching flurry came to an abrupt end, however, when a real-life nightmare broke in on my dreams. To be more exact, I suddenly lost my "steady" job in the city.

That set me scurrying around in search of work. But then the idea dawned upon me that maybe I *could* get



Here's the author (right) with his friend, Larry "Butch" Mical. Larry, incidentally, is the pride of Roosevelt Field—for though he is only 20, he's already a transport pilot with more than 250 hours to his credit!

something to do in the aviation field.

Yet *how* could I? I had neither pull nor actual experience in aviation—I was just a model-building FLYING ACES reader. However, my father came through with a practical suggestion. "Son," he said, "the only way to find out whether an aero company'll have you, is to go an ask them."

So with all the cards stacked against me I went around asking, finally coming in for a shoe-leather landing directly in front of the Seversky company's employment office. There I was faced with a sign which announced in good, plain English that "*Only Experienced Mechanics Need Apply.*"

But I walked right in anyhow—with the goofy hope that maybe I'd be the exception to this regulation. And you could have knocked me over with one of Sally Rand's fans when, two days later, I was notified to report in my working clothes at eight o'clock on the following morning.

Well, I'm here to tell you that I was so surprised that I sat looking at the notification letter much as a monkey would give the double-o to an autographed copy of *Einstein's Theory*.

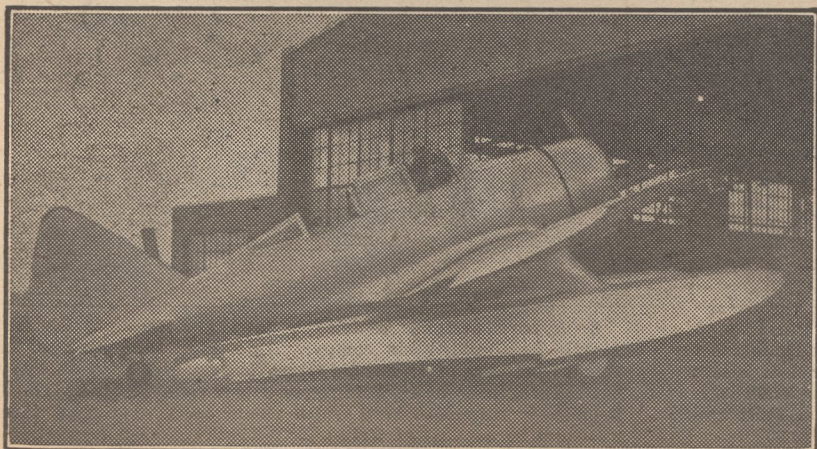
Immediately, I began reviewing in my mind what little I knew about building airplanes.

When I walked in next morning, though, I got "put right" in a hurry. While I had visualized myself working on speedy Seversky's that someday might bring down America's enemies in actual warfare, the Seversky executive office forthwith visualized me as just another worker in their *model* department. Very likely they didn't even visualize it—they just said "Get in there and go to work."

I found myself with the title of "helper"—helper to Julius Unrath, a well-known model builder who will be remembered by many of you as a former contributor to the FLYING ACES model section. Anyhow, Julie quickly apprised me of the fact that these Seversky models had to be made just right—and no fooling! They played a big part in "putting over" the life-size ships with the public. Hence, I could be sure that what I was to do wasn't kid stuff by any means. It was darned important.

THE MODELS we were building were castings of the BT-8. The Major—that is to say, Alexander P. de Seversky, famed pilot, designer, and head of the firm—wanted at least thirty of the miniature planes finished in time for the coming air show. Perfectly scaled, these models quickly drew attention to the Seversky's sleek lines and fine construction. What's more, they had a practical use, being wired for use as a cigarette lighter and as a night light. And a tiny clock was cleverly fitted in the nose. No, they didn't give these models away, you can bet. They sold 'em for \$25 each.

We worked day and night, Saturdays and Sundays included. And this kept up



Left: In the course of his work, Dave handled many of the parts which went to make the striking Seversky cloud-hurlers. This one is the Export Amphibian built for the Soviet Air Force. Reported to have a top speed in the neighborhood of 260 m.p.h., it mounts one .30-caliber swivel gun and four electrically synchronized, forward-firing Brownings.

THE REVEALING EXPERIENCE OF AN F. A. READER

Knowing that lots of you FLYING ACES fans hope one day to get a job with an aviation company, we've kept our editorial-cockpit hatch open for a "how-I-did-it" story that'd give you the real dope on getting a start in the aero industry. Well, finally Dave Cooke, one of our vet readers and model builders, came through with just the sort of article we were after. And here it is.

for several weeks. But I didn't mind. I was proud of the fact that my work was being done directly for a world-renowned pilot—a man I had read much about and had long admired.

Then one day came my biggest thrill. The Major had sent word for me to come to see him in his private office in regard to ideas I had evolved for changes in the models. Well, I revved up such foot speed to get there that I nearly disrupted the whole factory system. And then, after I finally arrived, I was so awed that I lost my tongue almost completely.

Thereupon, the model section was transferred to the hangar experimental department where in my spare moments I was able to see for myself just how new planes came into being, and just what those mysterious "mock-up's" really were.

While in experimental, I met Frank Sinclair, the Seversky test pilot. He was my hero. It was always my contention that he was one guy who could fly two barn doors stuck together with low-grade bubble gum and using a hand operated fan from a model "T" Ford for a propeller. And I don't think I was far from right. You should have seen him testing some of those planes. He'd roar across the hangar, virtually lay the empenage of his ship in our laps, then climb back skyward like a rocket.

I spent most of my spare time the first week in the hangar watching two *real* modelers work—the wind tunnel model builders. They used the best of mahogany and fine casein glue in making their miniatures, which were worked down within one thousandth of an inch of actual scale. Beautifully built, these tiny jobs provided performance data in the wind tunnel within four per cent of what the finished plane would do!

A SHORT TIME later, Unrath left the company, following which another "break" came my way. I was put in charge of the model department and was given two helpers and a raise!

Both of these new fellows were as inexperienced in this specific model work as I had been, but they had dabbled in aviation for quite some time. One of them was a licensed mechanic—a graduate of the Roosevelt Field Mechanics School; the other one was building a plane of his own design in his spare time at home. These qualifications didn't clinch their jobs, though. Actually, they were hired for the simple reason that they had built good models from time to time.

Yes, I was now a "boss!"

But my sally into chieftdom was not to last very long. The models were soon finished, some 300 of them, whereupon we were all transferred to other departments.

It was then that I got one of the most interesting and revealing jobs that the factory had to offer, for I was a stock chaser. It was my business to fetch necessary parts



Also an avid photo fan, Cooke was quick to draw a camera bead on the stars of the company. On the left is his snap of Major Alexander P. de Seversky, the top man. And on the right is test pilot Frank Fuller just after he'd put the Russian job (see photo on preceding page) through its trial hop. Note the flight-data pad in his left hand.



for skilled workmen—rivets, plates, washers, and the like—to carry stock from one department to another for finishing, and to trace missing parts.

As a stock chaser, I learned that in the P-35 pursuit there are over 10,000 individual parts assembled with about 500,000 rivets! Boy, when I saw the pile of parts and rivets that went into just one plane, I caught on to why it took so long to build an all metal airplane.

What's more, all those rivets have to be put through an anodic process—a special electric ray treatment—to protect them from corrosion. And in the bargain they are subjected to a terrific heat

—830 degrees B. T. U.—so that they will be soft enough to be hammered in by the rivet gun. Then after this heat treatment they are placed in a dry ice container to keep them from hardening; for otherwise they would toughen again, meaning they couldn't be used 'til they were "re-cooked."

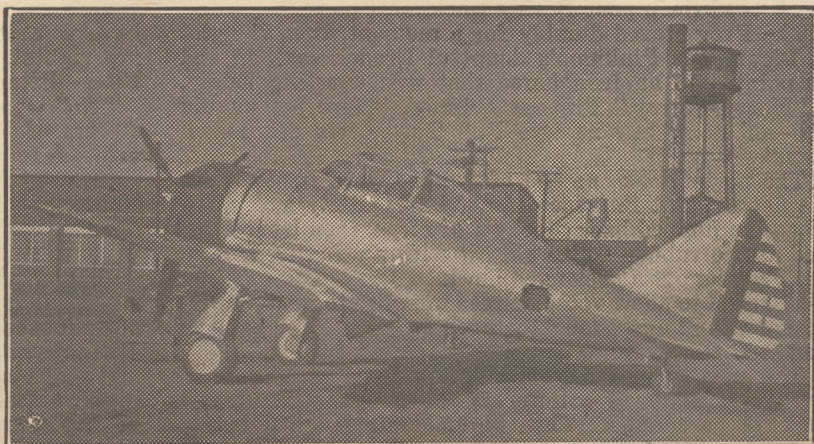
And here's something I'll bet you didn't know: If any part of the skin of the plane, which is made of Alclad, is so much as scratched during construction, it is replaced right on the dot.

During my chasing days, a new sidewalk was laid between the two Seversky buildings, and then all of us stock chasers were outfitted with roller skates so that we could make our trips between the buildings faster. Speaking for myself, the roller skating went along swell—until I hit a rivet one day while skating backwards. Poor little me! I had a bump the size of a goose egg on the back of my head for at least a week.

Perhaps you'd like to know what the Seversky stock chasers do when work is slack. Well, since they didn't want us around "under foot" in the assembly section, we found refuge in the wash room. But this wasn't the kind of wash room you're thinking of. Instead, it was a little frame shack behind the factory where all the metal was washed clean of ink and pencil markings before painting, or tagging as in the case of the Army plane parts.

NEXT thing I knew, a vacancy was open for a clerk—and since I had been attending night school,
(Continued on page 64)

Right: Dave Cooke tells you in this article just how many parts and rivets Seversky puts in this speedy new Army P-35—and we guarantee the figure will amaze you when you read it. Powered by a 1,000-h.p. Twin Wasp, this craft is capable of better than 300 m.p.h.





He found himself covered by a ponderous Hollander who was smoking a saxophone pipe.

Zuyder Zee Zooming

By Joe Archibald

Author of "The Spider and the Flyer," "Kraut Fishing," etc.

With Illustrations by the Author

HAVING just enjoyed two slam-bang weeks of leave, Lieutenant Phineas "Carbuncle" Pinkham stood in the Paris railroad terminal feeling as chipper as a burglar in a quiet bank. He knew that many citizens of the French Republic were still trying to convince the *gendarmes* that he was guilty of criminal assault, disturbance of the peace, and witchcraft, and he wanted to get the first train out before the Frog cops were won over by the evidence. But the Pinkham appetite for pulling the leg of the universe had not been fully sated when the Yank walked up to a Frog porter and asked for information.

"Monsewer," the prodigal son of Major Rufus Garrity's Ninth Pursuit Squadron began, "wheech ees eet ze railroad train poor Barley Duck, nest pass?"

The Frog stared dumbly for a moment, then the gist of Lieutenant Pinkham's doubtful French sank in and he pointed to an iron horse that was snorting loudly.

"Mercy, mercy," Phineas grinned. "Here ees un big tip—an' don't buy ze Eye Full Tower wiz eet, mawn amy."

The porter took one end of the proffered banknote in his fingers. But Phineas did not immediately let go. Instead, he jumped back a couple of steps, then let loose—and as the rubber dollar bill hit with a stinging smack, the Frog let out a prolonged howl.

"That is to show voose eet ees impolite to grab, mawn garson. And now adoo," the unquenchable Yank beamed and strutted away.

The porter blew on his tingling hand and watched the American flyer saunter to the Frog train. "Peeg! Chien!" he snapped. Then he suddenly laughed in his spade beard. "*Tres comique, non? Voila! Francois jus'*

notice zat he make ze meestake when he point out ze train. Ha! Ha! Ze worm she mak' ze turnaroun' queeck, oui. Ha! Ha! Ha!"

Anyhow, Phineas Pinkham found out later—too much later—that the iron horse he had boarded was headed for Valenciennes instead of for Bar-le-Duc. And when he demanded indignantly to be put off the train at once, he found himself addressing deaf ears. The conductor could not speak a word of English, but Phineas understood enough of the French tongue to comprehend that he was on a fast express and that he would go to Valenciennes and like it. Moreover, he could cough up some *argent*, as his ticket to Bar-le-Duc was no good on that particular stretch of track.

"It's an outrage!" the misguided Yank fumed. "I will have you all busted. I will see Clemenceau and demand my rights! I will be overstayin' my leave—I will get Blois—listen, Monsewer, let's talk things over, non?"

"No" was right. The Frog shrugged and jettisoned a stream of French that sent the Pinkham brain into a vrille. A fellow passenger translated it all for Phineas.

"He say *M'sieu mus' pay votre fare—or ze bastille in Valenciennes weel get ze new prisonair. He no can stop her ze chemin-de-fer, M'sieu. So she look lak vous ees—what you say in America?—stuck weeth eet. Ha! Ha!*"

"Ha! Ha!" Phineas echoed, "I am in stitches. Aw-right, I'll pay. But just wait, voose bums. I weel—"

So it was that Lieutenant Phineas Pinkham went to Valenciennes. And he found, after he'd put up at a hotel and sent his uniform out to be cleaned and pressed, that his troubles had not even started. An hour later a Frog bellhop came up to his room and told him that the tailor shop had just burned down.

PHINEAS IN HOLLAND—A DUTCH TREAT SPECIAL!

Ludendorff was well satisfied. He already had his sand and gravel on the Holland canals, and now his eye was on the Hollanders' ports. But when he began putting ants in their pants, Phineas raised the ante.

All of which proved that there's a limit—even to Dutchman's breeches.

"Wha-a-a-at? With my pants?" the Yank yelped. "Ya mean, garsong, that—oh-h-h-h!" Phineas plunked down on a bed and pawed at his freckled physiognomy. "Only my skivvies an' coat I've got. Listen, mawn amy, get eet ze new pants *pour moi*—trousers . . . breeches! Com-prenny? Pantaloons, nest paw? Oh, if I ever get back to Paree, I will fracture that Frog porter's skull. Get eet ze pantaloons, Frenchy—for I—"

THE DOOR of the Pinkham chamber was open. And at that moment a citizen of France, decked out in a Frog pilot's nifty scenery, chanced to pass. Hearing the commotion, he came to a stop and walked into Phineas' room. He looked at the Yank with the shades of his glimmers half drawn, then yipped: "*Bon soir, M'sieu. Pardonnez moi*, but maybe I be of aid, *oui*?"

"I am Lieutenant Phineas Pinkham of the U. S. Air Corps," Phineas responded, assuming as much dignity as a man without pants can hope to assume. "I sent my things to a tailor and he burned down his shop. Yes, I am in need of help, *Monsewer*."

"*Sacre! Oui*, Lieutenant Peenkham, what ees eet *vous* say in *Anglais*? Wan sucker you be, *non*? *Merçi, mon ami*, I have hear it said zat Peenkham—"

"I am in distress, M'soor," Phineas broke in. "I am due in Barley Duck tonight, an' here I am without ze pantaloons. Eet ees diggin' sewers in Blois for me if I don't get ze airplane—"

The Frog flying man reluctantly agreed that Phineas was in a mess and that after all they were both members of the flying lodge and should stick together. Then he called a cab and took Phineas out to the Nieuport field near Bouchain, telling the Yank that he would try and phenagle transportation for him out of the Frog C. O. What was more, he lent Phineas a duplicate of the uniform he was wearing. It fitted the pilot from Boonetown, Iowa, with surprising perfection, whereupon Phineas eyed himself in the mirror with obvious satisfaction.

"Say!" Major Garrity's absentee beamed at his reflection. "If Babette could only see me now, haw-w-w-w! I think I will get a transfer to the Frog army. Maybe the skimmer is a little big, but I can stuff it with newspaper. Veeva la Fraw-w-vnce!"

Thereupon, the French Nieuport jockeys made him welcome while his benefactor bearded the C. O. in his den to ask about ferrying the visitor to Bar-le-Duc, or at least part of the way.

Tales of Lieutenant Phineas Pinkham had reached the Squadron Commander's ears, however, and he emphatically refused to put a ship at the Yank's disposal. The Frog officer told his subordinate that the crackpot American probably had been filled up with giggle water when he left Paree and that, so far as he was concerned, Lieutenant Pinkham could worry his way back to Bar-le-Duc the best way he could. To be exact, the French officer had not forgotten a certain incident when he was an instructor at Issoudon.

"*Ze Chien*, he put ze ants in ze bed, *oui*. I nevair forget thees, bah!"

The gloomy news was conveyed to Phineas in detail.

He listened thoughtfully, then guffawed. "Well, mercy for tryin', anyhow. As a bum sews, so shall he rip, Monsewer. But I have got to keep your suit until I get home. I will send it in the mail to you. Adoo for now, bums. I will just take a walk around an' see the bread mixers you Frogs have to fly. Help yourselves to the cigars in my bag!"

"*Mais non!*" the Frog shook his head and grinned sagely. "You theenk we get born today or yesterday, *oui*? We have heard tell too much, yes, of ze Peenkham see-gars!"

Phineas only answered with a broad toothful grin of his own. Then he sauntered off across the drome. There was a Nieuport having its torso examined not far away, so the miracle man of the Ninth headed toward it. Just as he drew near, the prop began to turn. A little ground-hog saluted Phineas who asked: "Weel eet fly, Monsewer?"

"*Oui*," the mechanic replied. "*Il est tres bien*."

Quickly Phineas climbed into the pit of the Nieuport and fumbled with the controls. The engine let out a deafening roar just as three Frogs came out of their mess shack. One of them broke into a run and his baying could be heard as far as the Channel.

"*Arretez! Sacre bleu!* Peenkham, in ze nom de France—!"

But the Nieuport was already shooting across the field like a bull pup with a hornet glued to its empenage, and the French ackemma who had been grooming it was now picking himself up from the ground with his marbles scattered all around him.

Some *poilus* started shooting, and one of the slugs cut up through the floorboards of the Nieuport and made a mess out of the compass on the dash. But Phineas only tossed out: "Adoo, mawn garsongs. I will phone you from Barley Duck!"

Nevertheless, Lieutenant Pinkham did not reach Bar-le-Duc. An hour before dusk was due to creep over the Continent and before the north star had become visible up in the attic of the universe, the Yankee pilot of the borrowed Frog ship gazed around anxiously. Phineas had never been a good judge of direction, so he dropped down to three thousand feet and took a gander at the terrain spread out beneath him. It looked as if the war had folded up in his absence.

"Something is funny about this," he gulped, zooming a bit.

Then castor oil started to slap against his face, and once he got a mouthful of it. "Ugh," he sputtered, "the next thing I will be gettin' is sulphur an' molasses from the exhaust pipe of this crate. I wish I knew where I—why, I shoulda been over Rheims by now! Oh well, I will turn a little to the right. Gee there, dobbin. Giddap!"

LET us now move across the Rhine and get in on a bit of Kraut skullduggery that never got much publicity from the leading historians of the big tussle. Little did the *Herr Obersts* of the Potsdam menage know that Phineas Pinkham was unwittingly stabbing a finger toward the Wilhelmstrasse pie. Unaware of Fate's maneuvering, they sat about chuckling over a stroke of



A little jackknife work completed the illusion.

Jerry genius. They seemed to have a swell idea.

"Idt cannodt fail, *mein Freunds*," a Teuton with a dome as big as a grain bin ejaculated between puffs from a long-stemmed porcelain pipe. "*Der* Hollanders know der Englanders *und* French *ist* madt because der vater-vays in Holland *ist* used by der Chermans to ship der sandt *und* gravel ve use to buildt der ferro-concrete doogoutds by Belgium, *ja*. Zo! *Und* now ve sendt vun of our pilots ofer Holland in der French airblane vhat ve have capture, *und* dey tink idt *ist* ein French pilot. Our pilot he drops idt der bombs. *Und*—Ho! Ho!—der Hollanders dey blame idt on der French!"

"*Ach Himmel*," exclaimed another Kraut brass hat, nodding his closely shaved coco, "*zo idt ist der* Hollanders get madt at der Allies, *und* den dey vill ledd Ludendorff do anything vhat he vants to do, anyvay yedt. *Der* Dutch ports he gets maybe, *und* der Hollander army maybe fights mit our side, vunce. Four hundred *und* vifty t'ou-sandt men der Dutch *haben*, *und* maybe ve finally vin der var by der bombink mit dis French plane. *Hoch der Kaiser! Hoch Ludendorff!*"

Yes, that was the latest bit of connivry issuing from Potsdam, and the history books show you that Ludendorff actually threatened to go across the land of dikes, tulips, wooden kicks, windmills, and cheese and grab off the Dutchmen's waterfronts. Historians, however, neglect to recount the part played by Phineas Pinkham—perhaps because no one would believe it.

AND so it came to pass that high over the town of Leerham a Boche pilot, flying a captured Nieuport, looked down at a patch of color that was a tulip bed and then let loose three bombs. One washed out a pretty mess of blossoms, another rendered a grazing moo cow defunct, and the third bit a prodigious hunk out of a windmill. Round-cheeked Hollanders looked up at the plane, spotted the French cocardes on the fuselage, and immediately became convinced that the Frogs had double-crossed the Netherlands. Hotfooting it for cover, they did not see the other plane that had dropped down off a higher shelf. Major Garrity's Sinbad was in that one. And as he looked at the scenery below him, he suddenly realized that he was over the land where Hans Brinker set a skating record. He'd also seen the bombing.

"The dirty bum!" Phineas yelled. "Droppin' eggs on them Rip Van Winkles! If that is a Frog, he must be

boiled to the ears. But say! It is a Boche, I bet! He's tryin' to make the dike builders sore at us. But I'll show him that a Pinkham—take that, ya Heinie bum! An' that—!"

In the other Frog crate, the Jerry got over his surprise too late. A burst of mayhem chewed up one of his ailerons and the Nieuport went askew. Phineas quickly hopped on the Von's tail as he headed for tulip dirt. But his own sky wagon suddenly contracted a case of dry throat, and the hacking cough convinced the Yankee pilot that his gas tank was drained to the lining.

"Aw-w-w cripes!" Phineas yipped as he went down with a dead stick. He knew he had bagged the Boche, but his chances of retrieving him were as slim as a Floradora Sextette waistline. He had his own neck to think of for the next few moments, so he concentrated on picking himself what he thought to be a low, flat stretch of Dutch linoleum upon which to set the Spad down. The terra firma was deceiving, however, and it tossed the Nieuport over a fence into a tulip field. The jolt whacked the Pinkham cranium against his instrument board.

When he finally shook the fog out of his top story, the Yank found himself sitting waist deep in tulips. "Uh—er—I am killed at last!" he gulped. "It is a nice flower piece the bums give me. Tulips—but I am sittin' up, so how can I be dead? I—er—bawn swore, mawn amies!" he chirped on seeing he had company.

Several people wearing funny looking jackets and pantaloons had closed in on Major Garrity's errant flyer. They were smoking pipes as big as saxophones, and one of them nudged Phineas with what looked like a miniature canal boat but which really was a wooden shoe.

"French low-lifer!" a ponderous Hollander growled. "Maybe petter idt would be ve shooddt him right away vunce, *Mynheers*, *ja*?"

"Wait a minute! Wait a minute!" Phineas yipped. "I am innocent. It wasn't me—"

"*Der* French suit you have idt on, *ja*? Petter you shooddt mit Peter van Dunkengoot not try *der* foolink!"

"Look," Phineas argued, clambering to his feet, "I am a Yankee. I ain't no Frog. Listen goot, Mine hairs. Twenty-three skidoo for ya! Go way back an' sit down! Tell it to Sweeney! There, I guess you know I'm a U. S. citizen *now*."

The Dutchman gathered into a huddle, puffing furiously on their goose-necked dudeens. Finally one turned to Phineas and withered him with a glare that would have aged an Edam cheese in five seconds flat. "*Gunst!*" he snorted. "*Mynheer* Frenchy, coom vit' us, *ja*. It iss der Hooge Raad—der high court—at der Hague where you go. *Der* judges vill tell vhen you get shooddet. *Mein* wife feed you goot for der kloosterkerk. Ho! Ho!"

Phineas found out later that the long, drawn-out word "*kloosterkerk*" meant "cemetery," and he also learned about a lot more things that beat the Dutch. But the Pinkham sense of humor would not be downed even while he was being shoved toward a scattering of Holland dwellings. A couple of Dutch maidens—*jongvrowes*—gave Phineas and his classy uniform the well-known goo-goo-eye and snickered.

"Goot efening," the irrepressible Yank chirped. "Are you the wooden-shoe sisters? Wooden you buy me that? Wooden you give me this? Haw-w-w-w! If I ever get out of jail I will get your telephone numbers, you plump little dickenses you!"

"Quick! Moof faster!" *Mynheer* van Dunkengoot clipped. "Bomb us Hollanders, *ja*? *Der* judges by der Hague vill var declare. Our men vill fight—men of Haarlem, undt Leyden, undt Rotterdam, undt Amsterdam, undt Scheidam, undt Volendam—"

"I wish I'd never coom to yer—er—dam coountry," the prisoner quipped. "Haw-w-w-w!"

(Continued on page 75)

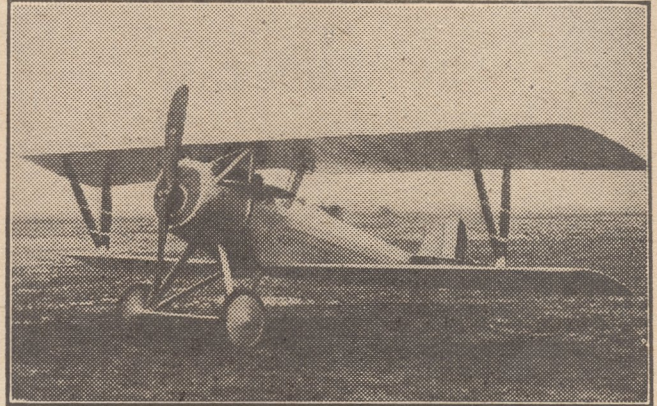


Two fast Fokkers were headed for the nape of his neck—and his own ship was about as speedy as a turtle with the gout.

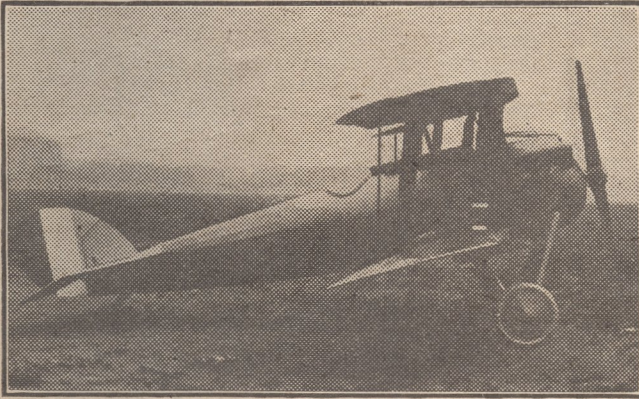
Snapshots of the War



Two hundred horses packed within the cylinders of a Clerget rotary engine drove this Nieuport 28 biplane through the skies of war. The N-28 was the last of the World War Nieuports, being the type used by the British Royal Naval Air Service squadrons in 1918. Those heavy center-section struts assured additional strength in the adjacent sections of the plane. Two fixed Vickers guns were mounted between them.



Built as a single-seater and powered with a 150-h.p. Hispano-Suiza engine, this special version of the Nieuport 17 wasn't overly satisfactory because it turned out to be unpleasantly nose-heavy. The lower wing, you'll notice, is the same size as the upper. Note that the arrangement of the cabane struts is somewhat different from that of the 28. Only one gun was carried.



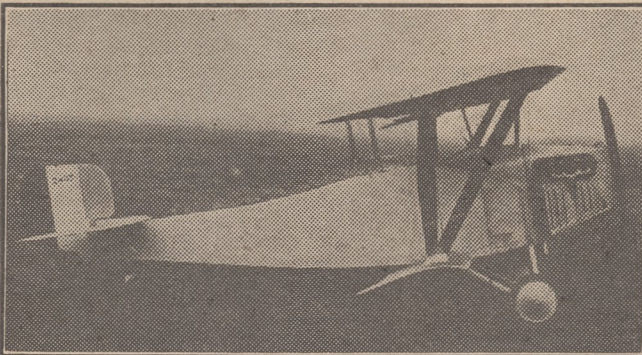
One of the most impressive of the Nieuport fighters was this N-17, which was powered with the 300-h.p. Hisso. The ship had many of the features of the Spad, but the tail assembly was typically Nieuport. In this N-17, the cockpit was set farther back than usual, and the guns were mounted aft of the engine. Note, by the way, the narrowness of the gap between the two wings.



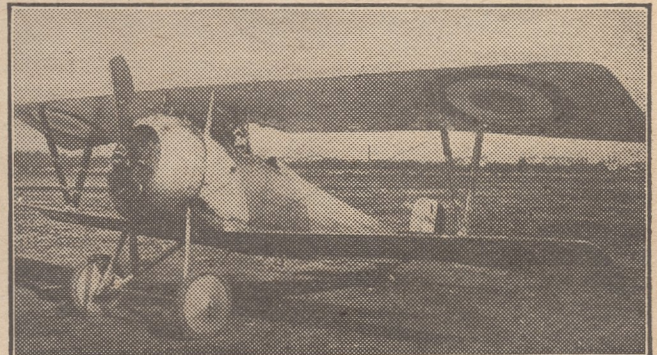
Sort of a freak, eh? This is the 1917 version of the Nieuport-Delage, the main features of which were the 120 Le Rhone power plant and several miles of wire (or it seemed like miles, anyway!). It was a two-seater development of the old N-17 and was fitted with sesqui-plane lower wing, V-struts, and an unbalanced rudder with no fin. The tandem cockpits were unusually "open."

PARADE OF THE NIEUPORT FIGHTERS

So active were the various French Nieuport models during the decisive days of the "Big Fuss," that we're sure students of World War aero history will agree with us that these ships deserve a special page all to themselves. So here's a line-up of half-a-dozen different Nieuports, each one of which played its respective part in the winning of the Western Front. Yes, the Nieuports did a good job—and that well-known War photo collector, Joseph Nieto, also did a good job in providing us with this topnotch selection.



That's a 180 h.p. Lorraine engine in the nose of this strange crate, listed in some war plane descriptions as the Nieuport 9. The ship was another two-seater, and its rear cockpit was equipped with a French version of the Scarf mounting fitted with guard rods. The idea was to keep the observer from bringing his guns too far around and shooting out his own V-struts.



Similar in appearance to the Nieuport 17, this N-24 has the same type of wings and general fuselage outline. But the wing struts are of the V-type instead of matching the broad variety shown in the N-17 photo just above on the left. Also, the N-24 had a full-circle engine cowling. Of course, you can plainly see that the ship's a single-seater.

"Alone" In the Air!

By George Lyle

Transport Pilot and Flying Instructor

SMALL HEADS VS. INFLATED HEADS

IN THE WORKING schedule that Instructor Chet Macklin followed, actual sky practice always came right on the heels of the ground talks. So Jack Conroy got into the air for his first dual session on his very first day at the field.

And when he found that he was able to follow the stick-handling tips Macklin had given him, Jack became immensely pleased with himself.

But had he been gifted as a contortionist, Jack Conroy would have kicked himself all over the field when, on the following Saturday, he landed after his second sky session.

"How can *one* guy be as dumb as me?" he blurted disgustedly as he trailed Chet Macklin into the flight office.

The veteran pilot suppressed a chuckle. "That's kind of a harsh word for it," he remarked. "But you certainly had yourself all primed for a let-down when you came out here today."

Young Conroy scowled down at an ineradicable oil splotch that marred the toe of one of his new boots. "I don't get you," he muttered.

Macklin dropped his lanky frame into a chair and cocked his feet on the littered desk top. "Well, last week," he began easily, "you just ate it up, didn't you? Yes, with the help of our little gag of figuring the stick as a rigid lever, you found it pretty darn easy to twist the ship around just as you pleased—so easy, in fact, that you began to suspect that Mr. Conroy's boy, Jack, was one of these 'born bird-men' you read about.

"So today you came breezin' out here as if you had just discovered feathers growing on your shoulder blades." And Macklin interrupted himself to laugh outright at his student's discomfiture. Then he added dryly: "But this afternoon things didn't go so well—and what felt like sprouting pin-feathers turned out to be only goose pimples."

At this jibe young Conroy reddened, but a little grin, a bit on the sheepish side, finally broke the droop of his mouth. "Gee!" he said impulsively. "I was cocky . . . awful cocky, wasn't I?"

"Yeah, awful," agreed Macklin solemnly. Then instantly his manner changed. He dropped a hand on the younger man's shoulder. "But when a fellow can grin at his own shortcomings, the chances are, he has what it takes."

Jack lifted serious eyes to his instructor. "I hope so," he said in a low voice. Then with a slow shake of his head he went on: "But I can't understand what made me so lousy today."

"No worse than average," the instructor told him. "Don't forget that last week you had only the stick to worry about. I was on the rudder. But today I turned the rudder over to you, and you simply had the usual

difficulty in trying to coordinate it with your stick."

"A little difficulty?" moaned Conroy. "If I could believe that was just 'a little difficulty,' I wouldn't feel so bad. If it was really just a matter of me using too much or too little rudder, I could understand. But I kept using the *wrong* rudder. I kept saying to myself, 'left stick—left rudder . . . right stick—right rudder' over and over. But doggone it, my legs kept doing just the opposite as if they didn't belong to me! . . . And, Mr. Macklin, I *know* better—honest I do."

The instructor nodded. "Sure, fellow. Old Man Habit often takes charge of things before we have time to stop him."

"But how could it be a habit when I never had my feet on an airplane rudder before today?"

"All of us, at some time or other," pointed out the pilot, "have had gadgets that we steered with our feet. Take a sled, or one of those wheeled coaster wagons with a bar up front. When you buzzed along on one of them, you steered by pushing that front bar with the foot on the *opposite* side of the way you wanted to turn. Well, that procedure rapidly became a habit with you—a habit that persists even when you know that its all wet in an airplane."

"So that's what was causing all my trouble!"

"Yeah, it bothers everybody when they start in. But I can tell you a little stunt that'll go a long way toward licking it."

A puzzled expression came over Jack's face. "But," he flung at his instructor, "if you knew I would have that trouble and you knew something that would help me, why didn't you tell me *before* we went up?"

"Because," answered Macklin evenly, "I felt it was more important that you got your head back to hat-size first."

"Huh?" grunted Conroy. But he quickly followed his "huh" with an embarrassed, "Oh." And then that engaging grin broke out on his face, and he touched his head significantly. "A thimble would fit it now, Mr. Macklin."

The instructor laughed. "Well, that's just about right, Jack. It's surprising how much more a small head will hold than an inflated one—which is something you can send to Ripley. And by the way, cut out that 'Mister' business. The boys call me 'Mac' when they're talking to me—and 'old Mac' when they're

talking *about* me. But I resent the latter. So be sure you're out of earshot when you call me that."

"Thanks. I will . . . Mac."

"Fine. And now I'm going to do something I don't often do. I limit most students to a half hour a day, but I'm going to let you take another lesson right now. I think it would do you good—that is, if you feel up to it."

"Gosh! I'd love to. I—I honestly believe I can do better now, Mr. Mack—Mac."

"Sure, you can. Particularly when I show you this little gag I was telling you about. I'll give you the dope through the Gosport after we get into the air."

"Let's go!" cried Jack. Then suddenly his face fell. "But didn't you tell the mechanics to bring the ship in for a check—a valve cleaning, or something?"



Our striking new story-form flying course got underway in peppy style last month when that veteran instructor,

Chet Macklin, wised up young Jack Conroy on the fundamentals of joystick handling. And now, after giving him a few pointers on rudder work, Macklin takes Jack into the air for some dual coaching, and just as Conroy's about to—but no, fans, we don't want to give this swell story away here. Dig in and read it for yourself. Read it whether you "caught" our first lesson or not—for in this ace-high George Lyle series, every single lesson has been written to stand as a complete feature in itself.

LEARN TO FLY WITH JACK CONROY — LESSON NO. 2

"That's right, I did. But they probably haven't gotten started on it yet. I'll have 'em roll her out again. By the time we get our 'jump-bags' on she'll be waiting for us. . . ."

KNEES TOGETHER

TEN MINUTES later they were in the air, with Jack in the front cockpit listening to Macklin's slowly paced instructions coming through the Gosport tube:

"At two thousand, I'm turning her over to you. Keep her nose on the horizon and the wings level. Don't think about your rudder—don't worry about it. Simply hold it neutral. And keep your knees close together. For that's the trick I was telling you about—knees pulled in until they're within a couple of inches of the stick . . . Hey! Watch the nose . . . On the horizon, I said."

Jack had looked down at his knees as he followed the instructions, and Macklin's sharp warning brought his head up with a jerk. He stared out forward and blinked. Why, the blamed horizon had slipped—dropped 'way down below his motor!

"Get conscious!" Macklin's voice cracked in his ears. "Your nose is up too far. Keep figuring your stick's just a rigid lever, and take it easy. Push the nose down with it . . . easy. Push it steadily, but slowly. Bring that horizon up until it rests on top of your motor. . . ."

"That's better," he finally said. "Much better. Now hold it! And for the hundredth time let me warn you to *keep* it there. At this stage of your work, nothing is as important as that. Regardless of anything else—*keep that nose on the horizon!*"

Jack caught his instructor's eye in the little rear view mirror Macklin had fitted to a cabane strut, and he nodded.

Macklin continued: "Okay. Now do exactly as I tell you. Get your knees in close to the stick again, but keep your feet firmly on the rudder pedals. All right. Now bank the plane to the left without trying to turn it. Just simply push the left wing down. Get me?"

Jack started to comply. But he quickly found that his left knee blocked the stick.

"In the road, isn't it?" came Macklin's voice instantly. You don't have to think about which leg is in the road, do you? Of course you don't—because you felt the stick bump it. You *know* it was the left leg. Now, then, if I told you to make a turn, you'd have to bank the ship. And when you started to do that—still keeping your knees close together—one leg or the other would be in the road. One of 'em would get bumped with the stick as you started to bank.

"Well, that's the tip off on this rudder business. The leg that gets bumped is the leg to use on the rudder. You can't miss. Just keep your knees close together. And when a turn is called for, the leg that gets bumped is the leg to use. Then just move the knee and start to straighten the leg—and you'll be pushing rudder on the correct side."

Macklin paused to let this sink in. Then he said: "Yep, that's the gag, Jack. And now we'll try—"

Abruptly his voice broke off, whereupon

"Mac!" cried Conroy, frantically turning in his cockpit. "MAC!" he shouted again, putting all the power of his young lungs behind it.

But Macklin didn't answer.

Conroy twisted around to see Macklin straightening up in his seat.

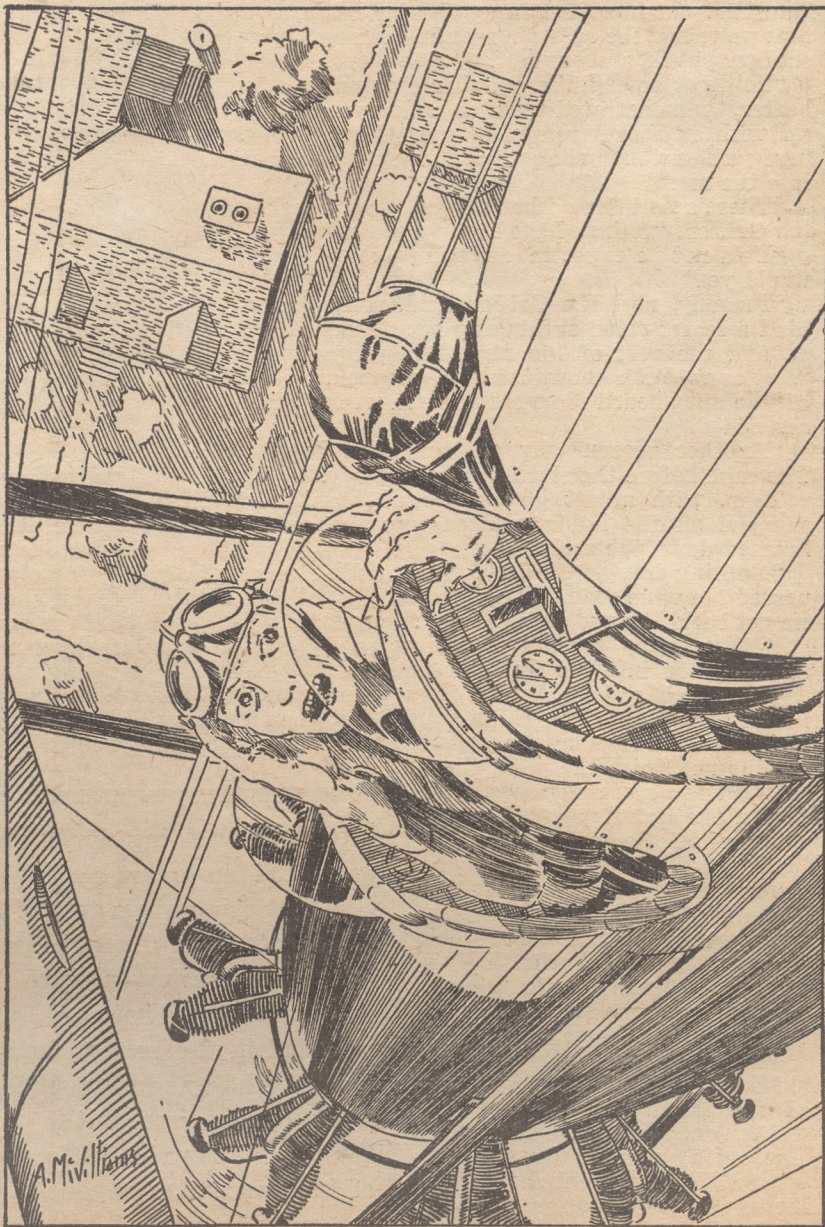
"Just a minute, Jack. Looks like one of the rocker box covers on the top cylinder is loose. The mechanics must have started that check and then forgot to 'safety' that cover when I ordered the ship out. . . . Hold her level and straight, kid, and I'll take a better look at it." And Macklin flipped the catch of his safety belt, raised himself up, and peered out over the windshield.

But suddenly the pilot's head jerked queerly, and his fingers, flexing, slipped from their grip on the cockpit edge. Then, with seemingly retarded action as in a slow motion picture, Macklin crumpled limply back into his seat.

Meanwhile, Jack Conroy had been keeping his eyes on the horizon. But not hearing any further word from Macklin, he now glanced up at the little mirror on the strut. And what he saw there made his stomach contract and his mouth go powder-dry.

The reflection of Macklin's face, framed in that bit of glass, made a ghastly picture! The square jaw sagged loosely. The eyes behind the curved goggle lenses were half closed; only the whites showing. And on his tight-fitting helmet, just above the left temple, was a ragged

(Continued on page 64)



Clipped-Wing Clue

By Arch Whitehouse

Author of "Sky Guns of Singapore,"
"Death Haunts the Clipper," etc.

NIGHT having fallen over Graylands, the Griffon was comfortably seated in his library, appareled in slippers and dressing gown and enjoying a good Havana cigar. Regardless of this restful setting, however, his mind was decidedly alert; for a T.W.A. pilot's report had just come over the radio:

*"Light scud at 3,000 and up to 4,500
Heavy layer of clouds from 5,000 to 7,000
Clear and unlimited above."*

"Perfect!" the Griffon decided, with a last puff at his cigar. "Let's get into the ozone, Pulski"—this to his assistant who was lounging on the other side of the room with the evening papers—"and find out how the tin egg-beater beats, now that we've had the old Avia rebuilt, the new super-charger put in, and the rest."

"Ye'll not be callin' any boiler o' mine an egg-beater," remonstrated the man addressed as Pulski with an accent reminiscent of County Cork. "An ye'll see that she's 'right' when ye get her into the air."

"There's no telling what all we'll see," laughed the Griffon. "Things have been too quiet to last."

"Ye'd not be expectin' anything outa the way, would ye?"

"Frankly, no," the Griffon said, reaching behind a secret panel and taking out a black cover-all and the rest of his night-flying equipment. "But as we both know, things do happen."

"We ain't heard from old Lang in weeks," Pulski added.

"Another reason why anything can happen. The calm before the storm, you might say."

Then, with a last glance around the library, they snapped off the lights, walked into the corridor, and hurried down the stairs.

"Nothing doing," the Griffon warned his man as they passed the wine cellar. "Lay off that O'Doul's Dew until we get back. It's not that cold upstairs."

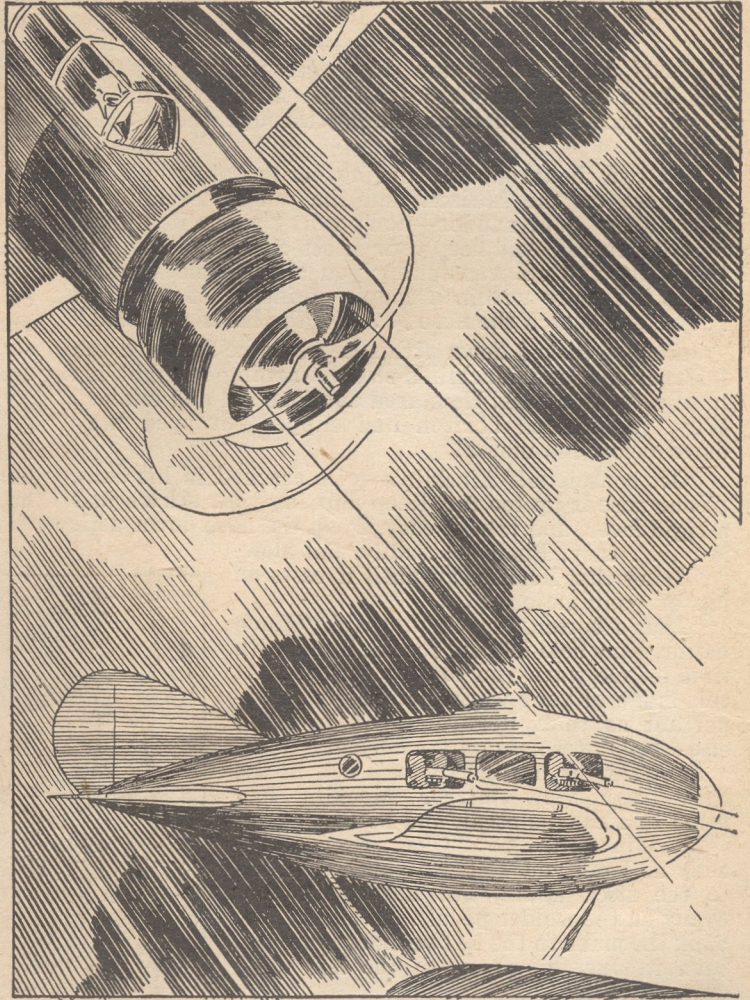
With a guilty gesture, Pulski wagged his head and continued on into the Griffon's underground hangar.

Then with practiced skill they prepared the Black Bullet for action. The Griffon slipped into the front seat and tuned the Avia motor. Pulski stood nearby until he got the nod from the pilot, then snapped two more switches. One doused the lights, the other put into motion the great doors.

In three minutes, the Black Bullet had been run out into the shadows of a heavy grape arbor, whereupon the great doors were closed from the outside. To all outward appearances the hangar had assumed the innocent lines of a garden rockery.

With quick decisive moves Pulski then opened the folding wings of the Black Bullet while the Griffon snapped in the king-pins. The Avia, muffled by Skodas, purred like a contented tiger as it was run quietly across the turf of the sheltered lawn to the hard

Into those scudding clouds roared the dread Griffon to test his ship. Yet the test that came was a test of himself! For that flight hurled him into a maze of mysteries—a weird sky craft that bullets could not down, a spy who operated in the vale of death, and a Colonel who was in two places at one and the same time! But to these startling mysteries, the Griffon added one of his own: "Range your gun—upon me!" he radioed. "And fire!"



packed sands near the boathouse.

Then the Griffon let her run down into the water, drew a steel lever back three notches on a quadrant, and the pontoons assumed a normal water take-off position.

"All clear," Pulski muttered as he slipped into the back seat and drew up the sliding hatch.

In a hundred yards she was well clear and climbing fast toward the west. And soon they were above 4,000, racing through a strange, filmy drapery of scud that hung from the upper cloud bank like gossamer props of some fantastic stage setting. Indeed, for several minutes they swept through this fairy-like medium.

"Queer, eh?" the Griffon said reflectively.

"Yeah, queer. In fact, it gives me th' willies," said Pulski. "It looks like somethin' outa a banshee story me Granny McShane used to tell me."

"Not the Granny McShane?" taunted the Griffon.

Pulski emitted a queer bellows sound—something like the pathetic gasp of a punctured football bladder—and sat down.

But no sooner had Pulski relaxed when a chunk of dural slammed across the tandem cockpit and banged a jagged hole through the opposite side and scarcely five inches from his chest!

DRAMATIC SKY ADVENTURE FEATURING KERRY KEEN

ANOTHER CRASH sounded somewhere behind, and Pulski turned like a mechanical doll and stared back. A great gap had been battered through the fuselage about two feet ahead of the main tail-section bracing.

Almost at the same instant, the Griffon hurled the Black Bullet over on one wing-tip and drew the stick back to zoom the craft away.

"What was that?" he yelled.

"Look, over there!" cried Pulski. Then his hands automatically brought his guns into play and he sent a full salvo of .50 caliber stuff full at a strange, clipped-wing ship that had suddenly appeared.

But though his aim had seemingly been good, nothing happened!

"What the devil!" he roared, giving the strange plane another deluge of leaden hail.

"If you can't do anything with that," roared the Griffon, "hold tight and let me have a smack at him."

Pulski stood behind his guns and peered at the unique machine as it raced through the gossamer curtains of cloud film. It was a small projectile-like craft

with wings hardly four feet in span apiece. From the windows of the well-streamlined cabin, flecks of flame spat out at them, indicating that these strange attackers had two high-caliber guns.

"What the deuce?" Pulski growled as he watched the Griffon wheel the Black Bullet around and poise for an attack dive.

"This is one for the book," the Griffon snarled. "It's smaller and racier than some of those trick jobs we saw at the National Air Races. Yet there seem to be two—maybe three—men in it."

And now the Griffon opened up with everything he had, and they could see four scarlet streaks battering toward the tiny ship.

But still nothing happened! There was something peculiar in the ship's motion that threw off their aim.

Amazed, the Griffon hoiked the Bullet up on its tail and screamed into a vertical zoom just as two explosions threw a double-yolk of flame at their tail, and chunks of shrapnel again crashed through the dural of their wings.

Pulski took his cue, leaned over the tail, and poured another torrent of lead toward the upper portion of the tiny fuselage, and this time a few of his bullets struck the craft.

But just then two more shells bashed out with loud *B-R-R-OOMS*. To evade them, the Griffon swept over into a reverse turn, then stared down and tried to figure out what kind of enemy they had run into. The little clipped-wing fighter was now streaking along to the left, doing sharp turns to avoid the Black Bullet's fire.

"We didn't bring that O'Doul's Dew, did we?" Pulski asked over the Griffon's shoulder.

The Griffon was in the process of another dive. "No," he answered. "But somehow I wish we had."

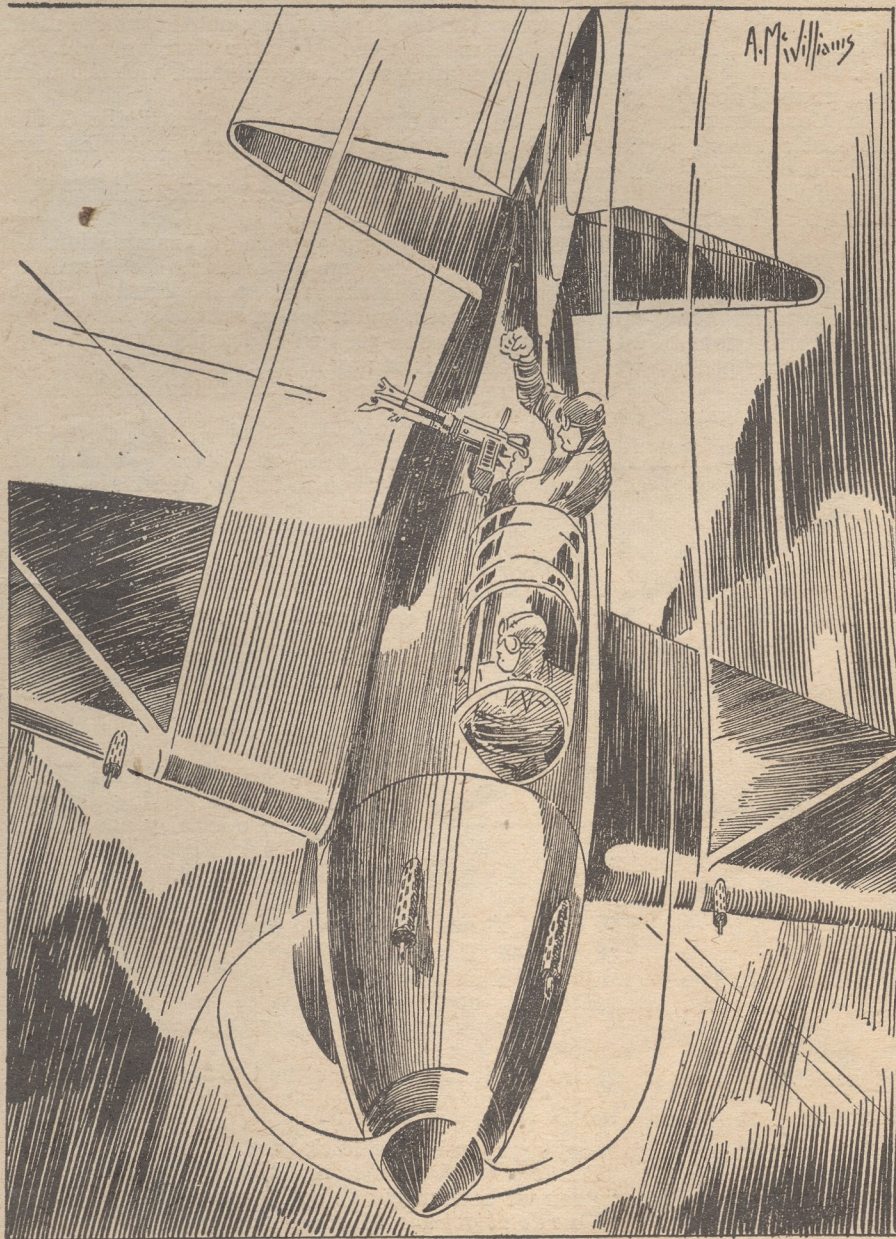
Again the Black Bullet went down, and once more two double streams of fire poured toward the little ship. But now she slithered into another series of turns, stuck her nose up slightly as if in derision, then shot through a curtain of filmy cloud and disappeared into the heavy cloud bank above.

"What is this?" the Griffon muttered. Then he opened his eyes in stark amazement. "Look!" he said, pointing off to the right.

But hardly had Pulski noted the tiny scarlet parachute that had attracted the Griffon, when there was a blinding flash of light, a tremendous crash of concussion—and the Black Bullet was blown over on her back. The Griffon tried to right her, but another concussion and an ear-splitting crash echoed out a short distance ahead. The Bullet went over again—right side up.

The next few minutes brought a bedlam of concussion and horror.

More scarlet parachutes came down, oscillated lazily, then blew to bits under the force of tremendous explosions. But the Griffon finally managed to get the Black Bullet's nose down into a full-power dive. Above him raged the deluge of dangling destruction as he eased



Battered by the strange stub-winged craft and hammered by the diving Seversky, the Black Bullet was trapped—trapped in a leaden vise of death!

out at about 1,500 feet and swung out to sea again.

A cold perspiration trickled down his temples and a strange taut feeling constricted the muscles of his back. Gradually, however, his terror changed into a kind of tingling courage and he turned back and shot upstairs again. For he was unable to ignore the fascinating attraction of that danger above.

For about a quarter of an hour he cruised about, darting through layer after layer of cloud trying to find the answer to the mystery. But no tangible clue remained to explain the mystery. There was only the tangy stench of picric acid and the irritating smell of burned explosive.

"When you gonner get down out of here so I can get cleaned up?" a voice suddenly boomed over his shoulder.

The Griffon turned, stared into the bloody mug of his gunner.

"What's the matter? You hit?"

"No . . . don't think so. Just a bad nose-bleed, I guess, from the concussion. But what the devil was that, anyway?"

"You've got me. Some kids playing pranks with their gas models, I guess. No wonder the Washington boys have started to license them," laughed the Griffon.

"Yeah? You ain't kiddin' me. You're scared, too—an' you know it."

"Scared? This isn't even me talking."

And with that reflection, the Griffon put the beak of the Black Bullet down and didn't pull it up until she was a few hundred feet above the water.

Then he cut in the Skoda mufflers again, cruised about carefully and finally caught sight of two Coast Guard cutters racing at high speed on a north-east course.

"They're looking for the cause of all the bang-bang," smiled the Griffon, "we'll have to be careful."

Thereupon, he cut wide of the C. G. ships and raced for Graylands.

THE BLACK BULLET skipped the rollers for about twenty yards and finally settled down on her pontoons. The Griffon glanced about in all directions, adjusted the angle of the pontoons for land movement, and ran up the beach.

Pulski was out in a flash, still dabbing at his gory face with a handkerchief. Then once they were in the shadows of the arbor, he drew back the folding wings and started to dart for the hidden switch that would set the Rock Garden mechanism working.

But he went sprawling on his face before he reached the base of the fake rockery.

"What the . . . ?" he started to say. Then he turned swiftly from a kneeling position and hurled himself at the prostrate form of a man that lay on the grass. He reached for the fellow's throat and held him taut for a minute. But then he sensed that the man was offering no resistance. So, puzzled, but wary, he eased up and stared down into the man's face.

The man was cold—stone dead!

Pulski, his face white, dragged him clear, then went over and yanked the switch set under a flat rock. The great doors opened and the Black Bullet was eased inside.

The Griffon crawled out through the open hatchway "What's up?" he asked, sensing that something was wrong.

"You'd better come out here and take a look at this guy," Pulski said in a hollow voice.

The Griffon gave Pulski a strange look, then went back out on the lawn. Pulski pointed to the strange relaxed figure.

"Let's carry him inside. We can't do anything here," said the Griffon.

Together they lugged the body into the hangar. And

under the lights they noted that the fellow wore a flying helmet, a face mask, and rubber cushioned goggles of strange manufacture.

"Whew! What is it? Something out of Buck Rogers?" cracked the Griffon, observing both the man's fine build and queer mask.

Pulski now turned the body on its face and disclosed a strange piece of equipment set in a light canvas harness. It seemed to be carried over the shoulders like a small rucksack and its main parts were long slender cylinders about two inches in diameter and approximately ten inches long. The Griffon snapped the small flaps up and pointed to two metal tubes that led from the cylinders to a kind of valve device attached to the strange helmet. Plainly, this was some sort of an oxygen mask of unusual design.

The coverall was made from some gray-green material of particularly fine texture. The man's pockets were empty and no marks of identification were to be found anywhere on the outside of the suit.

"Take that stuff off him," ordered the Griffon, starting to get out of his own flying kit. "Let's have a real look at him."

"We'd better fill him full of flat-irons and dump him out there in the ocean," moaned the perplexed Pulski.

"Don't worry. I will—after I find out what this is all about."

For fifteen minutes the Griffon and his homely assistant went over the corpse. They noted that the man's face was distorted, as if by some fear or pain. But there was no indication of any physical violence whatsoever.

"If he had been thrown out of a plane," the Griffon muttered, "he would be quite battered. But there isn't a bruise on him."

"Okay, then how did he get here? Walk on the water?" queried Pulski.

The Griffon simply went on with his examination. The man was about thirty and appeared to be a military type. He had a wind-burned face, a small neatly clipped mustache, fine teeth, and a healed scar over his left eye. His clothing was well-pressed and expensive, but there were no labels on it of any kind.

"What are you planning on doing with him?" demanded Pulski.

"Leave him down here for tonight and see what happens by tomorrow."

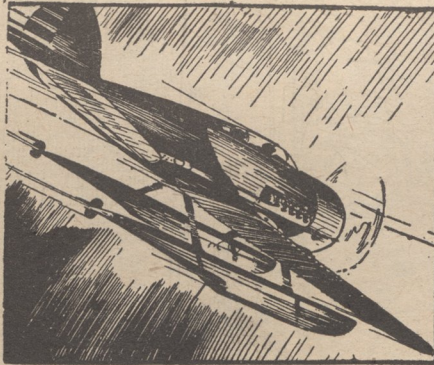
"You're taking an awful chance."

"I know it. But first we must try to find out who he is, where he came from and what he was doing here."

So they deposited the body in a corner, covered it with a piece of burlap, and snapped off the lights. Then they went upstairs.

"Well, Mr. O'Dare," smiled the Griffon, addressing his man by his correct name, "what do you make of it all?"

"You've got me, Mister Keen," answered O'Dare getting the situation back to normalcy again. "But I'll bet a buck Mister Drury Lang will soon be asking us a lot of questions."



HARDLY had he spoken when the telephone bell tinkled. Kerry Keen lifted the receiver languidly and breathed an easy "Hello."

"Hello, my eye!" snarled a voice from the other end. "How long do I have to sit here and wait for you to report?"

"Sure, an' it's Lang," said the O'Dare, his eyes on the ceiling. "Whenever the phone begins to rattle I know—"

"Shut up," ordered Keen. "No, not you, Lang—I'm just trying to quiet the Mick here. But what's up?"

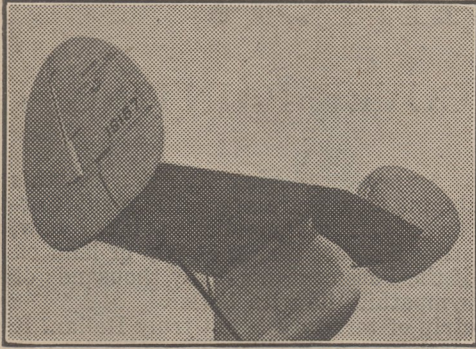
"That's what I want to know!"

"Then we both might as well hang up, eh?"

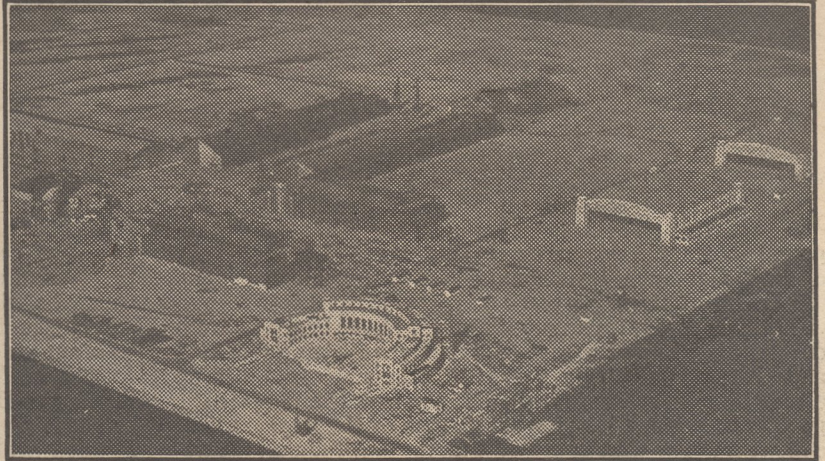
"Now don't get wise. Tell me what the devil that battle is that's been going on up your way. They got half the Army out here," Drury Lang bellowed over the wire.

(Continued on page 68)

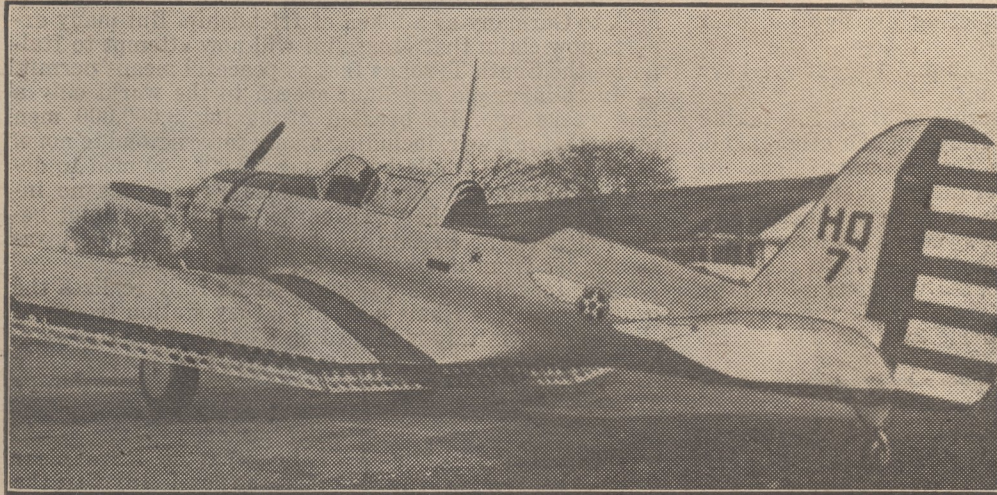
Through the Aero Lens



Maybe you'll argue with us about this being the business end of a plane. That's what it is, though! For the stick and rudder bars wouldn't be much good if these tail surfaces weren't able to head the ship in the desired direction. And have you recognized these twin rudders yet? They belong to the Martin 156, the "Ocean Clipper" recently shipped to Russia.

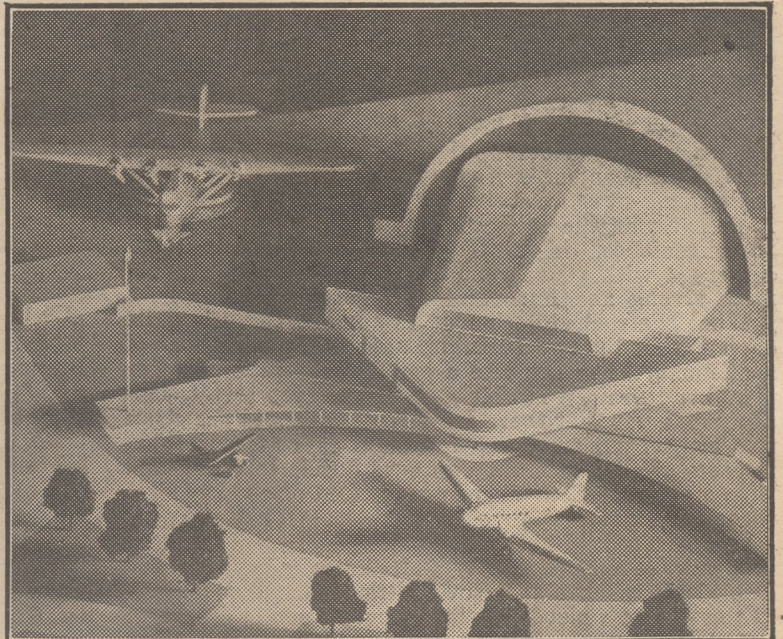
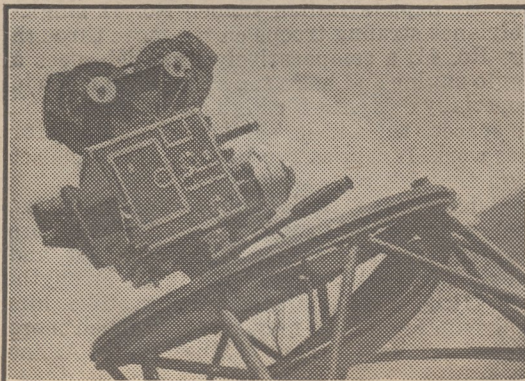


Above: Ever see an airport in the making? Here's a grand photo of the aviation end of Treasure Island, the 400-acre artificial island in San Francisco Bay on which the Golden Gate International Exposition will be held next year. It was taken shortly before the landing field, hangars, and the like, were entirely finished.



Lace undies for airplanes is the latest "fashion note," it seems! Maybe that's why they call an airplane "she." Really, though, the funny-looking affair peeping out from beneath the wings of this Army Northrop A-17A attack job is a perforated landing flap, a new control feature that breaks up the turbulence of air flow and adds to the safety of "sit-downing." The picture was taken at Langley Field, Va.

Below: Quite a contraption, we'd say, is this technicolor camera atop the rear cockpit of a Lockheed SC Sirius Special. No wonder some folks get "camera shy" when one of these things is shooting away at them. The machine was mounted in this manner so's the cameraman could get "upstairs" above New York City and make colored film sequences for the picture "Nothing Sacred."



Airport a la the future? Well, maybe the sky-stations of tomorrow will look like this, at that. Anyhow, this shot shows a table model of the Aviation Building which will be a feature of New York's World's Fair in 1939. It was constructed directly from the architect's plans for the real-life edifice. Part of the aero exhibit at the Fair will be a huge Clipper plane suspended against the domed rear wall of the building. Its props will be spinning, and visitors will be permitted to manipulate the controls.

Will the "Axis"

Break at Brenner?

THE SENSATIONAL STORY OF OUR COVER PAINTING

AT FIRST GLANCE, you may want to argue that we're a little ga-ga in presenting a cover illustration in which Germany and Italy are shown engaged in aerial combat over the Alps. But as a matter of fact, such an international complication is not beyond the realm of possibility.

Yet, you'll say, Germany and Italy have reached an understanding known as the "Rome-Berlin Axis"—an alliance between the two great dictator nations built up either as a bulwark or a threat against the democratic powers of Europe. So by what stretch of the imagination, can we believe that some day in the not-too-distant future Italy and Germany will be waging war against each other? What events justify such an idea? And what's back of this cover of ours depicting air fighting over the Brenner Pass?

Well, in the first place, Germany and Italy never have been great international friends.

Germany has never quite forgiven Italy for taking sides with the Allies in 1915. Italy, on the other hand, has never had any great love for Germany since the World War, which saw her bitter defeats along the Piave by Austrian troops led and trained by Germans.

It is only the events of recent years that have swept Germany and Italy into each other's arms. Both are ruled by dictators and both have adopted vigorous militarism in an effort to wipe out the defeats of the Great War and to gain what they consider their rightful place in the international sun. And since both have been frowned upon by the more peaceful nations, it was most natural that they should cultivate each other's friendship when the rest of the world became hostile to their militarism.

Thus it was that the so-called Rome-Berlin Axis was born. But we must always remember that this alliance—if alliance it is—can only be considered a pact of convenience. And any agreement so weak that it goes under the head of "a convenience," is quickly dispensed with when some more strong and important national force takes hold.

What the real situation is, few know. But it's quite obvious that the two Dictators are now in something of a dilemma. They are like a couple of boys who, after planning to raid a marble game across the street, suddenly discover that there are a few players in the circle who are a little too tough to take a pass at. Generally, in cases of this sort, the two boys decide to go off and have a game of their own instead. And often they then proceed to quarrel among themselves—for they were looking for a fight in the first place.

It may be said that Italy and Germany have already ambled off to have their own little game. And it may be that Hitler's bloodless victory over Austria may turn out to be the "makin's" of their own little quarrel. With German troops now encamped at the historic Brenner Pass between Italy and Austria, Mussolini probably doesn't like the situation as much as his press releases try to make us believe he does.

Formerly, there were peace-loving Austrians at this gateway into Italy, but now there are battle-ready Germans. That's not so good, from Mussolini's point of view, we'll bet, considering the fact that the strip of land on the Italian side of the Pass contains many thousands of Germans whose sympathies lie with Hitler.

You see, that strip of territory is not truly Italian. It was annexed by Italy after the War. The idea was to form a buffer along the Brenner line against Germany in the pre-Hitler days.

These Tyrol Germans under Italian rule naturally beamed when Hitler's troops took over Austria and moved into position at the Brenner Pass. They like to feel that one day Mussolini will give this South Tyrol strip back to Germany as a token of friendship. But many experts now claim that Mussolini will now attempt to Italianize the South Tyrol as fast as peaceful means permit.

Mussolini made a defiant speech to the world only a few weeks ago. He boasted of having 9,000,000 men available for a war, including an air force second to none. Well, Mussolini would hardly need 9,000,000 men to defend Italy against France, because France has no intention of leaving her own borders. And he cannot believe that Great Britain would attempt a war of invasion miles from its home bases.

Therefore, it seems obvious that he fully realizes the grave threat the Nazis present as they station troops at Brenner Pass. Italy is bathed on all sides by water—except at the north. Only there could Mussolini's great army go into defensive action.

So what is more clear than the possibility that the two Bad Boys of Europe may yet disagree and pitch into each other? What is to stop Hitler from attempting to carve his way through Brenner Pass to regain rule over his South Tyroleans? He got away with it in Austria, and he's already bringing pressure to bear on Czechoslovakia. Maybe the next step after that will involve action at the Brenner Pass.

Mussolini definitely does not relish the fact that Nazi troops are stationed at Italy's border. Friction is likely. And with it may come a bloody clash at the Brenner Pass.



OUR ARTIST, Mr. Schomburg, has shown what might happen if Hitler sent his troops through the Brenner Pass. He depicts Italian Romeo Ro. 41 single-seat fighter biplanes strafing troops on the move through the Pass. The Ro. 41, a comparatively light job, uses a 390-h.p. Piaggio engine and has a top speed of 211 m.p.h. It has been especially designed for high altitude work and for confined spaces, thus it is particularly suited for mountain pass work. It carries two Breda-Safat guns set to fire through the airscrew.

No one, outside of the Italian military authorities, know exactly how much the Pass is fortified. But before the Great War, the Austrians bulwarked much of it, and it is believed that Mussolini has added to its strength.

And so, if Hitler's determined marches take him through the Brenner Pass, he may run into much more than he bargained for—because Mussolini's Alpine Eagles, well-armed with Breda-Safat guns, are ready!



WISCRACK-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. Contributions cannot be returned. Address all letters to **WISCRACK-UPS**.



BRITISH TAR: "Our aircraft carriers do 30 knots. Wot do yours do?"
YANKEE GOB: "Dunno, sailor—but the Admiral raises the devil if they don't keep up with the airplanes."

NOT FOR HER!

Among the prospective passengers in the waiting room at the Glendale Airport was an elderly lady who seemed to grow more nervous with every passing minute. Finally, she approached an attendant.

"W-what time did y-you say the plane leaves for San Francisco?" she queried.

"It takes off at 11," replied the attendant. "But considering the heavy ticket sales, you'll have to fly in the second section."

"That settles it!" declared the old lady decisively. "If any airplane is going to be in *two sections*, I'm staying on the ground!"

Dumb Dora thinks they had radio aviation back in '49—for she just read a story of the gold rush days telling how a fellow was run out of town on a beam.

NIPPED IN THE BUD

Tom: Poor Joe flunked plane geometry.

Tim: Isn't that too bad! And he wanted so much to go into aeronautics!

THANKLESS

For many weeks, John Jones pleaded with his aunt to pay for his flying course. Finally she did. John Jones became an aviator. And now he looks down on his aunt.

QUITE UNDERSTANDABLE

"Well, doc, how am I?" asked a flyer after a crackup.

"Very well," replied the medico. "Your arm is fractured, but that doesn't bother me."

"Sure, doctor," snapped the aviator. "If your arm was busted, it wouldn't bother me, neither!"

CLASSROOM CALCULATION

Instructor: If you subtract the velocity of a head-wind from the speed showing on your air-speed indicator, what is the difference?

Dumb stude: Yeah, that's what I say.

THE POOR F.F. AGAIN

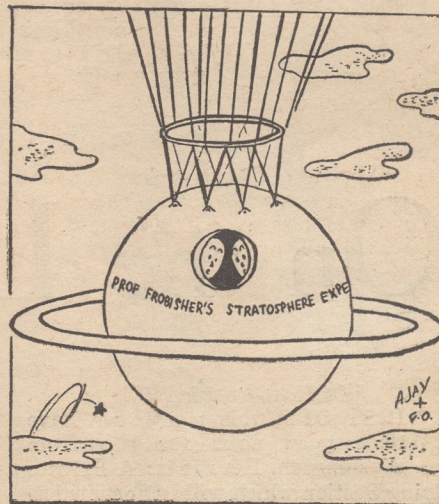
Blotz: Brown's Flying Flea just went out of control at 50 feet altitude and crashed.

Glutz: Air pocket?

Blotz: Naw! He got caught in the prop wash of a gas model that flew by.

OH, YEAH?

For hours the flyer had been trying to find out what was wrong with his plane, and he was getting madder every minute. Finally, he could hold his temper no longer. Raising himself up to his full height, he threw his tools on the ground and in a roaring voice cried, "Oh, fudge!"



"All I can say, professor, is that Saturn musta passed this way."

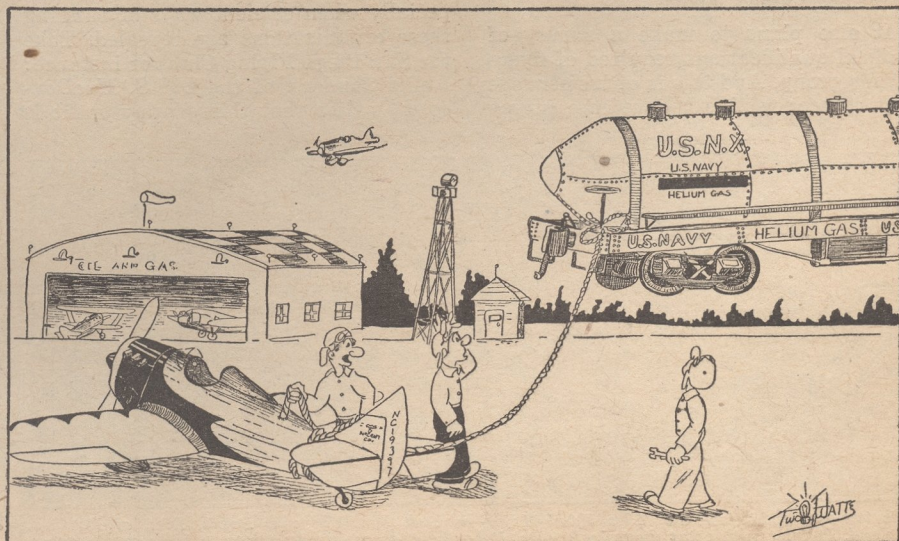
GROUNDLED

A love-sick young flyer named Baylor,
 Sold the Cub he had boughten from Taylor,
 He married Miss Zipper,
 A cross-country tripper.
 And now he co-pilots a trailer.

TAKEN AT HIS WORD

Green lieutenant (excitedly): What a scrap! Fifty Fokkers on my tail! Why, I've never seen that many Fokkers in all my life!

C.O.: I believe you.



"I found it floatin' over Lakehurst an' thought I better bring it in."

WE HAIL THE P. F. S.!

HOW THE SAN DIEGOANS
DO IT

THE WING-OVER WHICH
WASN'T

On the Light Plane Tarmac

Known as the Avro "Cadet," this machine has long been a light-plane stand-by in Great Britain. Suitable for dual-control training, single-seat touring, and blind-flying instruction (after conversion), it's a true triple-purpose sky bus. Fitted with the 215-h.p. "Lynx" radial motor, it has a top speed of about 125 m.p.h. and a cruising range of some 300 miles.



WE HAIL THE P.F.S.!

FIRST OFF, this month, we have some good news for you from Washington. Here it is: A Private Flying Section which will be "devoted to the encouragement and stimulation of all phases of private flying," is being established in the Safety and Planning Division of the Bureau of Air Commerce!

Now that's what we call a great move forward!

The new Section will busy itself with the problems of the private flyer and will especially consider the drafting of rules and regulations designed to boom sport skymanship in a big way. The Bureau, by the way, defines private flying as all sky-scooting in the sport, pleasure, business, student instruction, and fixed-base operation fields.

In order to make direct contact with the American piloting public, the Bureau plans to form a Private Flying Advisory Committee composed of 20 members and representative of all the branches named above.

It also plans to make a survey of medical qualifications required of flyers in this group. And this is of tremendous importance; for it's believed the survey

will show that the physical bars can be let down a bit. And that would open the sky gates to a large number of fellows who want to become pilots but who can't under the existing strict regulations.

All told, it sounds swell to us. Yes, we wholeheartedly hail the new Private Flying Section!

HOW THE SAN DIEGOANS DO IT

MEANWHILE, sport crafters, how are you all doing? Are you well on your way toward soloing? Have you banded other prospective flyers together, and are you pooling your cash for a plane?

Anyhow, tell us your story so we can pass it on to the other readers. And let us have your advice and suggestions on the way we are running the Tarmac; for there may be angles to this business that we're missing, and we feel that we all can mutually benefit by frank discussion.

Flying club news is always good—especially when efficient ways of running these organizations are revealed. Take the San Diego Flying Club for instance: Hollis Sanders, of the U.S.S. *MacDonough*, writes that this snappy outfit is

a non-profit group whose members chip in to buy all the equipment.

Originally, the club was formed by Consolidated Aircraft Company employees, and their first bus was a second-hand Taylor Cub bought on time payments. Well, fans, everything worked out jake; so when that ship was paid for, they again pooled their bucks and got a Porterfield. And when the title to that ship was clear, they got a brand new Cub. What's more, they're now planning to add a fourth plane. So you can see that the San Diego Flying Club is a mighty lively bunch.

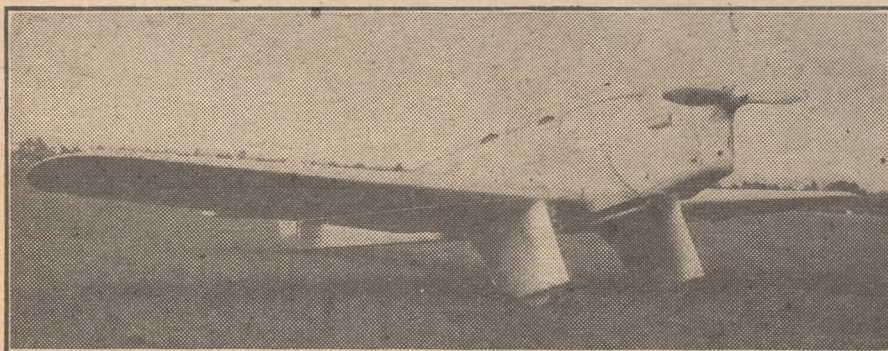
Now here's how the club works the financial end: Suppose they purchase a new ship for, let's say, \$1,500. With ten in the membership, each fellow puts in \$50, and that covers the down payment (and, of course, with twenty members this initial outlay would be only \$25 apiece).

After that, each member would be required to pay \$10 a month as regular dues and \$1 an hour for solo time. Dual instruction would be \$3, with \$2 of that amount going to the instructor.

In event of crackups, the case is carefully examined by the crash committee of the club which has authority to decide the responsibility. If the member who flew the ship is entirely to blame, he is required to pay for the damage or forfeit his membership rights. But if the fault is not wholly his, he chips in with the rest of the fellows to cover the repairs.

Any time a member wishes to quit the outfit, either a new fellow may step in to take up his membership or the cost may be spread among the remaining clubsters. In the San Diego outfit, however, it's never been necessary for the members to assume such obligations. There have always been a number of would-be members ready to step in and fill the gap.

This, then, is another tried-and-proved way of running a flying club. So



This two-seat light job—the Miles Hawk-Major—is built by Phillips & Powis, Ltd., of Reading, England. Popular with sport flyers in Britain, it has been a consistent performer in European races. Indeed, Miss Jean Batten used a Hawk-Major on many of her famous flights. The ship, which mounts a 130-h.p. Gypsy-Major engine, has a top speed of 150 m.p.h.

keep this info handy if you're planning to start an outfit or if your present organization isn't stacking up the way you'd like to see it.

THE WING-OVER WHICH WASN'T NOW COMES our letter of the month. And this time it's from Hollis Sanders, the same fellow who gave us the info above on the San Diego Flying Club. The solo flight he describes certainly had his spine tingling, and we only wish that he'd mentioned the name of the plane so that some of you flying readers could have ventured an explanation as to what caused the trouble. But here's the letter now—

Light Plane Editor:

One bright day a short time ago, I was roaming around by myself at 5,000 feet. The air being clear, I suddenly decided to try a few verticals; for I needed such practice, previously having over-controlled and slipped out of them on numerous occasions.

Yep, first I'd do a series of verticals, then I'd try a stall and wing-over—something I'd never attempted before. So I flew out over an uncongested area, dropped to 3,000 feet, then nosed her down and gave her the gas to gain plenty of speed.

Well, my verticals weren't too bad, so I set myself to try the stall and wing-over. I throttled the motor down and hiked th' nose off the horizon, and soon she reached the stalling position.

But somehow I just couldn't get the stick back far enough to make a clean stall out of it! To be sure, the plane was mushing, and I expected to "make it" any mo—

Wow! At that second, my left wing suddenly dropped down, and when I jerked the stick to bring 'er back I over-controlled and down went the right wing! Then I couldn't get the right wing back up, although I gave it full left stick; and to make matters worse—much worse—the ship started turning to the right.

I frantically applied left rudder—full left rudder—but it didn't help. My plane kept on turning to the right!

Sweat was running down my face and my heart did a couple of loops. This ship was noted for its tendency of winding up in a spin in rather short order—and I'd never been in a spin. What's more, I had no parachute.

Then, thank heaven, I came to my senses, gave her the gun, and managed, finally, to regain control. And boy! What a fine feeling it was to see that nose back on the horizon!

Forgetting all about my wing-over, I went back to the airport. But one of these days, I'll do it. Then maybe I'll have something else to write you about.

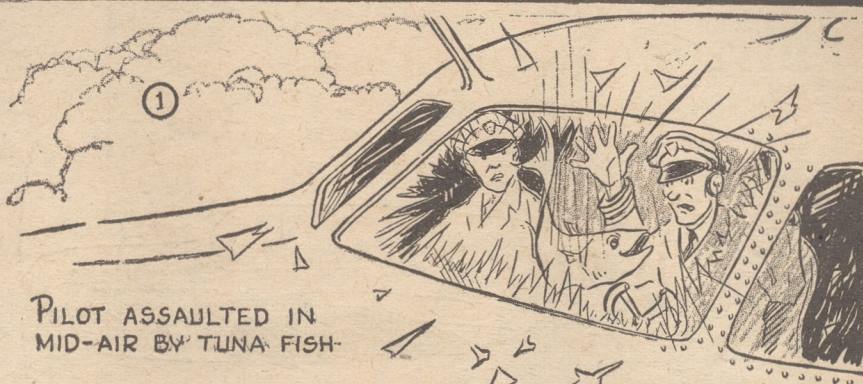
HOLLIS SANDERS

U.S.S. MacDonough
San Diego, Calif.

Well, Hollis, you get \$2 for that interesting letter. And as we're a little worried about that over-controlling business, we suggest you put those two bucks toward a short flight-check with a good instructor. He'll have you straightened out in no time.

PILOTOPICS

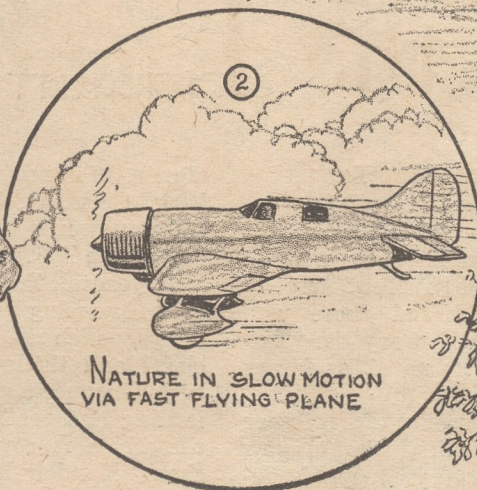
By ROY HUMPHRIES



PILOT ASSAULTED IN
MID-AIR BY TUNA FISH



KIT CARSON
RIDES AGAIN!



NATURE IN SLOW MOTION
VIA FAST FLYING PLANE



BALSA, FASTEST
GROWING WOOD . . .

Stories Back of the Above Pictures

1—NO WONDER Pilot John Casio of Pan American was surprised! While he was buzzing along over Vera Cruz one day, a large tuna fish suddenly crashed through his windshield and landed on his lap! But it wasn't raining fish in the old Biblical style. Instead, a higher-flying frigate bird was simply carrying the tuna home for his supper. And startled by the plane, he dropped it—

Right on poor John Casio!

2—TWO HOURS before his recent lecture in Pittsfield, Mass., ornithologist Lawrence B. Fletcher found he didn't have the right films with him. But after a quick phone call to Boston, the required celluloid rolls, which depicted birds in *slow motion*, were sped, with decidedly *fast motion*, to Pittsfield in time for the showing.

Yep, an airplane brought 'em.

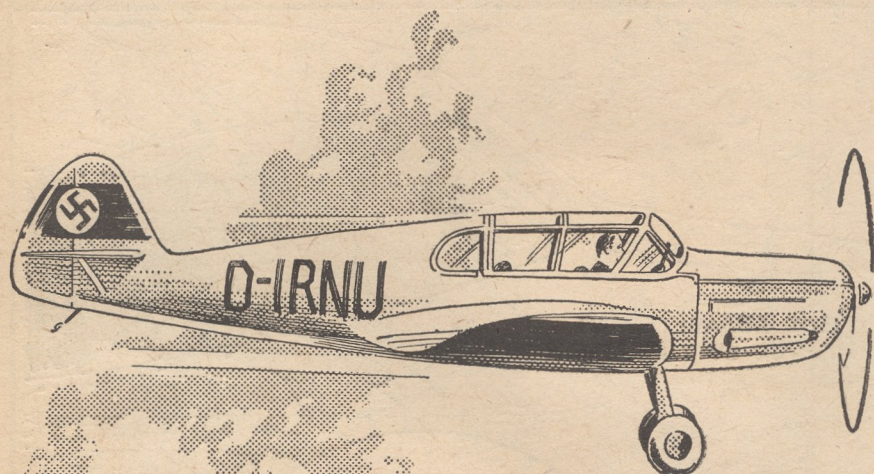
3—A NAMESAKE of the famous American scout is Captain Kit Carson, crack pilot of United Air Lines. But instead of "carrying on" in the West, our modern Kit does his galloping (sky galloping) in the East. He operates a transport over the Newark-Chicago route, and as for chalking up mileage, he's got the original Kit—

Beat seven ways for Sunday!

4—LIGHTNESS isn't the only thing for which balsa, the standard model building wood, is noted. What really amazes the botanists is its astounding speed of growth. For sprouting from a tiny seed, balsa reaches a height of 75 feet in about five years!

Models made with it don't always climb that fast!

Modern Planes Album



MESSERSCHMITT "TAIFUN"

THE MESSERSCHMITT "TAIFUN"
THIS interesting plane is the prototype from which the high speed Messerschmitt fighter was developed. The word "Taifun" actually means "typhoon," and those who have seen it in action say the "Taifun" lives up to its name, as far as pep is concerned.

The ship is a product of Professor Willie Messerschmitt, who is now Germany's leading high-speed de-

signer. It is manufactured at Augsburg, Germany, by the Bayerische Flugzeugwerke A.G.—in other words, the B.F.W. Company.

In general, the "Taifun" is a four-seat low-wing cabin plane. The wings, which are cantilever, taper in chord and thickness from roots to tips. They use a single box-spar with leading and trailing edge ribs, and the whole is covered with a metal sheet. Handley-Page slots are set

along the entire leading edge, the section toward the tip operating automatically and the inner portion working in conjunction with trailing edge flaps which are actuated manually from the cockpit. The flaps extend almost the full length of the trailing edge.

The fuselage is metal monocoque incorporating flanged oval hoops spaced by open section stringers. Over this frame stressed skin duralumin is riveted in vertical panels.

The motor used is the 240 h.p. Argus, an eight-cylinder Vee-type engine which gives the plane a top speed of 189 m.p.h. It cruises at 161.5 m.p.h. and lands at 52. (Any air-cooled engine of from 180 to 250 h.p. and not weighing more than 440 lbs. may be installed in place of the Argus.) The fuel tanks, enabling a 620-mile cruising range, are set in the wing roots.

This four-seater provides dual control for the two front seats. There are windows that open at will, and the doors may be completely detached in case of an emergency, giving pilot and passengers plenty of room to get clear with parachutes—a feature which might be copied by many American light plane manufacturers.

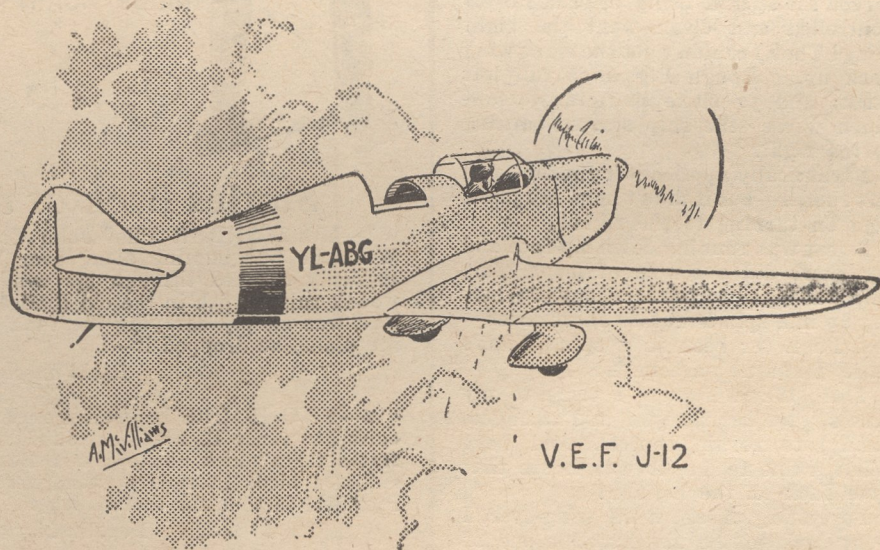
THE V.E.F. J-12

HERE is a light plane manufactured by the Valsts Elektrotehniska Fabrika (V.E.F. Company) of Riga, Latvia. A State-controlled aircraft factory, this concern started manufacturing airplanes in 1936 when they brought out a light two-seat cabin monoplane equipped with an 80/90 Cirrus "Minor" engine.

Recently, this 1936 job was superseded by the new J-12 (see illustration), a slightly heavier model specially, strengthened for aerobatics.

The wing is built in three sections, the center-section being built integral with the fuselage and with tapered outer panels bolted to this main portion. The structure consists of one main spar and an auxiliary box spar of laminated spruce with plywood sides. The wing is entirely covered with plywood laid with the grain at 45 degrees to the chord. Differentially-operated and statically-balanced slotted ailerons are fitted, and hand-operated split trailing-edge flaps run from aileron to aileron.

The fuselage is a rectangular box structure with a domed roof built up



V.E.F. J-12

on laminated spruce longerons and a plywood covering. As for the engine, this again is the British 80/90 Cirrus "Minor," a four-cylinder in-line inverted air-cooled engine. Set on a welded steel-tube mounting, it drives a wooden airscrew and is fed from a 16-gallon tank set in the center section. It gives the plane a top speed of 149 m.p.h., a cruising speed of 123, and a landing rate of 47.

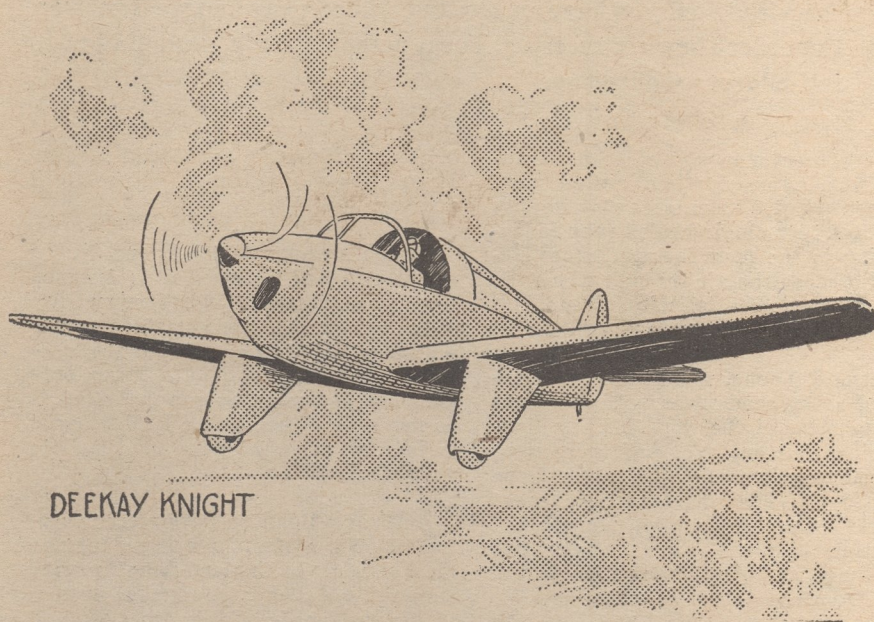
On this J-12 the undercarriage is a single-leg cantilever type affair fitted with oleo shock absorbers, low-pressure wheels, and brakes. The legs and wheels are enclosed in streamline fairings.

Pilot and passenger sit in tandem seats under a transparent cabin top.

The general specifications of the plane are: span, 30 ft. 6 in.; length, 23 ft. 4 in. and wing area 118 sq. ft.

LATEST OF THE FOREIGN LIGHT PLANES

This month we temporarily depart from the military field in order to offer you a snappy four-ship flight of the newest foreign sport jobs—British, Latvian, and German craft that indicate the present trend of amateur aviation abroad.



DEEKAY KNIGHT

THE DEEKAY KNIGHT

NOW we come to a new British machine manufactured by the Deekay Aircraft Corporation, Ltd., of Broxbourne Aerodrome, Herts., England. Indeed, the firm itself is new, evidently coming into being to attempt to fill the great need for

"home-grown" light aircraft.

The Deekay Knight is not a particularly imposing machine, mainly because of its "trousered undercart" (as the British call it), its quite bulbous fuselage, and its bull-like nose. Nevertheless, we learn that it is very easy to handle in the air, comfortable

for both pilot and passenger, and cheap to run.

A low-wing craft equipped with slots and ailerons, the general structure is wood with a plywood covering, the span is 31 ft. 6 in., the overall length 22 ft. 10 in., the height 6 ft. 7 in. and the wing area 140 sq. ft. The Deekay weighs 850 lbs. empty and has a payload of 258 lbs.

The 76-h.p. Cirrus "Minor" engine gives the ship a top speed of 125. It cruises at 107 and has a range of 500 miles. The pilot and passenger sit side-by-side under a transparent covering, and dual controls have been provided for them.

In flight, the Deekay consumes 4 Imperial gallons of gas an hour and 1.5 pints of oil. Its initial rate of climb is 800 feet per minute, while at 10,000 feet it does 470 feet per minute. It has a service ceiling of 17,500 ft.

While to the American eye the Deekay is somewhat ungainly, it has many favorable points. Repairs are easy and cheap to complete, and she flies under splendid control at all times. So all in all the Knight makes a fine sport craft.

THE BÜCKER STUDENT

LASTLY, we show this new model offered by the Bucker Flugzeugbau firm of Rangsdorf-bei-Berlin, Germany—a low-wing edition to the long line of light aerobatic jobs that have been turned out by that famous firm.

Having been seen in action at our Air Races, Americans are familiar with Bucker's "Jungmann" and "Jungmeister" trainer and advanced-trainer biplanes. More than one hundred of the "Jungmann" type have been sold abroad, and in addition they are being made under license in Holland, Switzerland, and Czechoslovakia.

This new design—which gets away from the conventional biplane type—is a two-seater with cantilever wing and partially-faired fixed undercarriage.

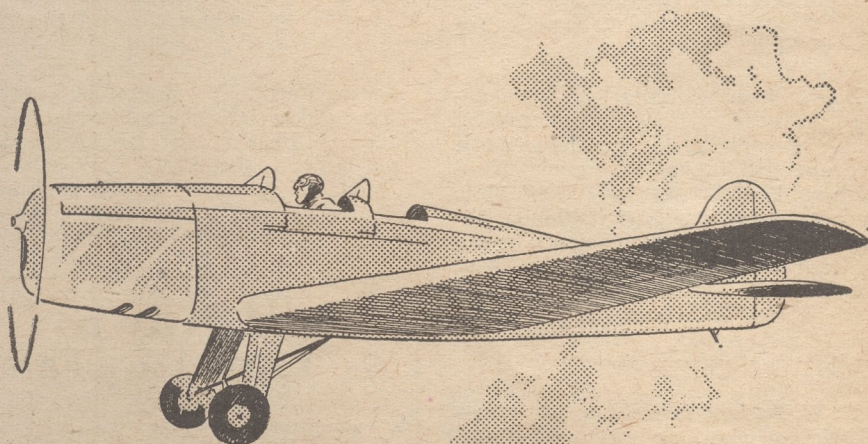
The fuselage and tail assembly are not unlike those used in the biplane models. The framework is welded chrome-molybdenum steel tube covered with fabric except for the forward portion, where there are metal panels around the engine, and a small section of the front cockpit.

The Student uses the Walter Mik-

ron II four-cylinder in-line inverted air-cooled motor, a Czechoslovakian plant rated at 62 h.p. which gives the plane a top speed of about 110. It cruises at 93, has a cruising range of 405 miles, and a service ceiling of 14,750 ft. The payload of the Student is 304 lbs., and loaded it weighs 1,190 lbs.

As a matter of fact, the Student is quite like the Latvian J-12 presented

on the opposite page, as the illustrations disclose. Both have motors much alike and use wooden airscrews, and both use the same type engine mounting and cowling. However, the J-12 is a fully covered job, while the Student is open with wide-flaring windshields. And the difference in horsepower explains the differing speeds and general performances offered by these craft.



BÜCKER STUDENT

All Questions Answered

This section of FLYING ACES is at your service. So if you have an aero query, fire away and we'll answer it here. All questions will be considered in the order they are received. For a personal reply, send stamped, self-addressed envelope.

Wayne Thurston, Bangor, Maine:—The S.E.5 was a stronger and faster ship than the Fokker D-7. The fighting records prove this beyond a shadow of doubt. The D-7 made its reputation before the days of the S.E.5 and Camel. The initials A.E.F. mean American Expeditionary Forces. The British used B.E.F.

Harvey Hanley, Chattanooga, Tenn.:—Your design for a combination mono-plane-giro in which the rotor folds down into the wing, seems to have some value. I would suggest that you present it to some recognized authorities such as the Pitcairn Autogiro Company, Pitcairn Field, Willow Grove, Pa.,

Wilfred Herring, Warsaw, Ind.:—As far as I can make out, the actual details on the Lockheed stratosphere ship have not been given out. You might try writing to the Lockheed Aircraft Corporation, Burbank, California. Maybe they'd be willing to give you some information.

Larry Mantere, Port Arthur, Ontario:—Many thanks for your picture on the Short-Mayo ships. However, it is not suitable for publication, as we must have actual photographs. The illustration you sent would not reproduce well.

Bob Camden, Chicago:—Yes, a number of those special Ford transport planes were built, and I believe one or two are still in use in Canada. None were used here, as far as I know, since the air-freight business in the United States has a hard time competing with the railroads. Ford only built two types during his stay in the aircraft industry. National Air Transport and the Stout Air Line were taken over some years ago by the big time transport lines.

H. W. Burkell, Edmonton, Alberta:—Thanks for your long letter on the Mackenzie Air Service. But haven't you made a mistake? The plane you say is a Douglas is plainly marked as a Benny Howard DGA-8. Look it up again in your February F.A.

Jack Sweningsen, Lake Forest, Ill.:—Not knowing exactly what type of air-wheels you have installed on your gas job, I can't give you a guaranteed prescription for curing the leak. If they are the valve-inflation type, you'd probably get good results by shooting in a small dose of sealing compound such as is available for bicycle tires. Of course, if the wheels are old and the rubber has lost its life, we'd suggest this cure: Select a new pair from the ads in FLYING

ACES. In answer to your other questions, the wheels on wartime crates were "dished" to give them more play in jolty landings. The single-bladed prop is, according to the manufacturer, more efficient because the air through which the lone blade passes isn't broken up into uneven eddies by a preceding blade.

Bernard Young, Loudonville, Ohio:—Georges Guynemer was not an athlete in any sense of the word. Mickey Man-nock had but one eye. And there were several war time aces who only had one leg. So you don't have to be a great athlete to be a great pilot. Many noted war-time airmen were comparative weaklings, and one or two suffered from tuberculosis.

Sam Dower, Wadena, Minn.:—Very sorry, but our Latin always was pretty punk. So we didn't remember that the word "Magister" meant trainer or teacher. We thank you and the other 'steen readers who jerked us up upon this one.

Steve Nyitray, Akron, Ohio:—I would say from your drawing that you might become a fair artist, but I cannot say what sort of a designer you may make, as you do not include specifications or stress details of your ship.

Joseph Faust, New Braunfels, Texas:—I do not know whether a 6-engine ship along the lines of the Bell Airacuda could be built. Frankly, I don't believe it would be practical, as you suggest, with two Allison engines mounted in the two outer nacelles. We gave the details

of the new Spartan Zeus in the Modern Planes Album department of our April number.

Joseph Nugent, Staten Island, N. Y.:—The new Bell "Airacuda" is designed to carry a number of 50-caliber machine guns and two air cannons. But so far no cannons have been fitted, the ones shown in the early photos being only dummies as far as we can make out. I do not believe the Boeing P-26 wing as it is now designed can accommodate wing-gun boxes.

Anthony Mennone, New Haven, Conn.:—No, so far there is no regular air mail route to England from America across the Atlantic. A number of test flights were made by Pan American and Imperial Airways, but no regular scheduled runs have been carried out as yet. I believe the new Boeing transport is built on the same jigs as the Flying Fortress. It has practically the same dimensions—a span of 105 feet, length of 70 feet, and height of 15 feet. The body is somewhat higher and may be about 17 feet. As far as we know, the new Hawker Hurricane fighter, which recently did 408 m.p.h., is the fastest land plane in the world today.

William Kerr, Edinburgh, Scotland:—Many thanks for your kind letter and the information on your experiences in the Auxiliary Air Force. We like that sort of thing and wish we had more space to devote to it.

E. Gayer, Roxbury, Mass.:—Yes, other countries have fighting planes on the export list, namely, Britain, France, and Italy. They sell plenty of ships abroad but do not put up the old bunk about the secrecy on them. Pictures, detailed drawings, and full information are available on these planes in all European magazines. Yes, tests similar to our 9-G dive test are regulation on the other side. I can't tell you how many planes there are in the U.S. Navy. That's more of the secrecy stuff.

Kenneth Coleman, Elkland, Pa.:—The letters "NC" are the international markings used by the United States. All countries have their own identification letters. "N" refers to the United States and the "C" means commercial. Most controllable-pitch props are actuated electrically from the pilot's cockpit.

Erwin McAllister, Walla Walla, Wash.:—The old Dornier Do-X is now nestled comfortably away in a Berlin aeronautical museum. It was a 12-en-

(Continued on page 66)

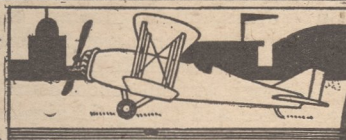
And Now~ We'll Ask You a Few

- 1—What is the unusual feature about the Bristol Aquila engine?
- 2—Does the Bristol Company make other engines incorporating this feature?
- 3—How many different engines does the Jacobs Aircraft Engine Company make?
- 4—What is the Menasco "Super-Buc-caneer" engine?
- 5—What is the highest horsepower engine turned out by the Ranger firm?
- 6—Does the Wright company manufacture a two-row engine?
- 7—What is the Brewer "Gryphon" engine?
- 8—Does any American firm manufacture an aircraft Diesel engine today?
- 9—What is Soviet Russia's outstanding aero engine?
- 10—What is the lowest horsepower known in any accepted aero engine?

(Answers on page 80)

HAPPY LANDINGS

BY ARCH WHITEHOUSE



What Do They Mean, War "Games"?

THOUGH we hate to say so, we've got a rather sad picture of the recent war games in which our U. S. Naval Air Service saw sham battle action off Honolulu.

We grant, of course, that practically all we know about those secret Pacific war maneuvers has been gleaned from carefully censored information that has been allowed to trickle out to the newspapers, and hence we cannot speak with the full knowledge of an observer who was on the spot. Nevertheless, after reading those meager reports, we'd like to have our say—and we hope you'll bear with us.

Anyhow, the press statements have it that \$300,000 worth of first-class Naval aircraft was lost, eleven highly-skilled flying men were killed, and no less than six other planes only just escaped bad crashes when they had to make forced landings at sea.

Furthermore, one aircraft carrier recently completed was not "ready" for the games, and another had to be withdrawn from the action at the last minute because of an epidemic of throat trouble that swept the vessel from stem to stern. And on top of this nine boats were swamped during the landing of troops at Lahaina Roads and four more were completely wrecked. Not to mention the fact that five sailors and one Marine were injured during the exercises.

So, all in all, the war games turned out to be something of a Roman holiday.

Now we hasten to say that personally we have the highest respect for the Naval Air Service, its traditions, and its discipline. We owe much to a close association with several top-ranking officers and service pilots who have been more than kind in offering information and assistance in our work. And we have been sincere in writing many laudatory articles about aircraft carrier pilots and about the efficiency of the service.

Yes, fellows, in this matter we're for the Navy men. For they've always impressed us with their serious attitude and their aptitude for adjusting themselves to all sorts of conditions. They are a loyal lot, and their past records have been among the highest in the world.

But working from that angle, where, then, did the trouble lie in the Pacific

games? We wish we knew. And we hope that what we say here may help get somebody busy finding out.

According to high ranking officials, the accidents to the two bombing planes (which we assume were Consolidated PBY's) "did not demonstrate that there was anything fundamentally wrong with the planes or the pilots." On the contrary, they said, the performance of the planes in the maneuvers designed to test Hawaii's defenses had "conclusively proved their value in scouting operations."

Meanwhile, however, it was reported that one of the bombers had plummeted into the sea during a rain squall "and sank before the radio operator had time to flash a warning." Thus it is that one wonders how these officers came to decide that there was nothing "fundamentally wrong with the planes" involved in these disasters or how they proved their value in scouting operations—if one of them crashed with high loss of life before the radio operator could send out an S.O.S. Or was it because the pilots were ordered to fly extremely low in the maneuvers?

IT is agreed that some of the planes involved in the tactics did complete their duties successfully. Thus the details of the Navy problem were carried out. But it is obvious that some one is going to start asking questions one of these days regarding the exact cause of some of the trouble that occurred, and many of the questions will be hard to answer.

It will not be enough to make comparisons with other services—for to point out the standards set by foreign navies, or the casualties suffered by foreign air forces in such games, would be a decidedly loose approach to this particular case. And it will not be enough to

blame it on the dead flyers. There are too many living ones who, it may develop after a searching probe, should be protected from the same fate.

But no matter how you look at it, it still seems strange that war games conducted in an area which the Navy is supposed to know inch by inch should result in such wide-spread destruction. To be sure, Lady Luck often puts on her frowning act. But you can't pass off all that trouble simply as the bad breaks or normal toll of war games.

Or can you?

War games, as we understand them, are staged to simulate service conditions in order that commanders may practice with wartime problems—may thus learn how to tackle and solve them. But certainly it isn't intended that those simulated wartime conditions should result in wartime casualties! We believe that service planes which cost \$150,000 apiece, and which are manned by men whose training probably cost twice that much, should be capable of a less calamitous performance. We readily accept the prospect of accidents, but hardly of such disasters.

Somehow, we don't think the trouble lies with the pilots or the planes, even so. That leaves only the high-ranking officers who conducted the games from the bridge—all of which is an angle about which we have no information and hence have nothing to say.

But in any event we hope that the Government carries out a really piercing investigation—and finds out exactly where the blame belongs.

Flyers were killed, planes were lost, sailors were injured, boats were swamped, and carriers weren't available. It sounds like a *real* war, so we say—

What do they mean, war "games"?

AERO BOOK REVIEW

Good news! Victor W. Page puts out another fine work—the "Airplane Servicing Manual"

AVIATION volumes by Victor W. Page have long been "standard equipment" in my writing workshop. Way back in 1918, Page's *A.B.C. of Aviation* was one of my pet volumes, and since then I have carefully collected

his books for the technical side of my library. His latest volume is the *Airplane Servicing Manual*, and it's being published by the Norman W. Henley Company, 2 West 45th Street, New

(Continued top next page)

York City, a leading text book firm. An impressive work, it contains 1,000 pages and 500 illustrations. The price is \$6.00—and it would be hard to obtain such a wealth of worth-while technical information anywhere else for ten times that sum of money.

The author, Lt. Col. Victor W. Page of the Air Corps Reserve, is also a member of the A.S.M.E. And as we've said above, he's not a one-book man. His work is thorough, he knows what he is doing, and he always manages to collect expert artists to illustrate his volumes—men who know just what it is he is trying to put over.

The *Airplane Servicing Manual* is well gotten up, intelligently written, and worthy of every laudatory statement that has been made about his other volumes. It provides a complete work of plain-English reference for all who are interested in the inspection, mainten-

ance, rigging, engine work, trouble-shooting, and repair of all types of airplanes. It has been prepared for students, pilots, airplane and engine mechanics, commercial operators, and field service men. In short, it offers a thorough ground school course on the practice and theory of airplane and engine servicing, and thus it will be of special value to pilots who wish to service their own planes. For the same reason, light-plane clubs will "go" for it.

The increasing use of small airplanes for individual transport, as well as the increasing demand for trained mechanical personnel by our expanding airlines and factories, has to some extent resulted in a shortage of competent licensed airplane and aircraft engine mechanics. And so we welcome this book containing such a wealth of information pertinent to the trade. Indeed, no up-to-date mechanic should be without it.

What's more, those who plan to enter the aviation servicing business can get their fundamental training in the use of the tools peculiar to the industry from this book, together with information on the structural make-up of every representative type plane. For Page gives all mechanical processes and complete synopses for aircraft inspection and maintenance such as are routine in a modern aircraft hangar.

Here are some of the chapters: Air Depot Organization, Airplane Wood-Working Processes, Wing and Fuselage Covering, Welded Steel Frame Construction and Repair, All-metal Structures, Airplane Inspection, Engine Inspection, Fixed Aircraft Radio.

We repeat—the *Airplane Servicing Manual* should be in the kit-box of every mechanic in the country and on the book shelf of every flying club.

—A. W.

The Airmail Pals

THAT old saying about "It's better late than never" isn't always as true as it might sound. But this trip the phrase applies quite nicely. For with National Air Mail Week underway as we write, we're just now celebrating by giving special attention to pen pal epistles that have come in via Uncle Sammy's air mail service.

The first letter is from Victor Reichow, of Jackson, Mich. As a matter of fact, I might say the first *batch* of letters came from Victor, because he sent in a whole scad of them at one time and dispatched each one by air mail. And with their colorful stickers, stripes, and stamps, those envelopes made a mighty bright display on the R.H.P.D.'s desk.

In one of his letters, Vic added to that list of hobbies we gave you last month. For next to aviation, "hitch-hiking extraordinary" seems to be his greatest pastime. Vic's hiked and hitched through twenty-two of our forty-eight states. He spent five years as a cowpuncher in Montana, too.

Twenty-six years old, Vic wanted British pen-pushers—ladies preferred. And since we had on hand a combination letter written by a pair of pretty little Scottish lassies—Peggy Christie and Ray Stewart, of Dundee—we forwarded it to Vic. Yep—it went by air mail, too.

HOW TO GET AN AIRMAIL PAL

FIRST, write a letter just as if you were writing to your new pal—the kind of letter which tells your age, particular interests in aviation, your hobbies, et cetera. (If you wish, you may include a separate sheet of paper telling us, in a general way, what kind of a pal you seek.) Next, 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 and five cents in stamps or coin.

Now, when your letter arrives, 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 in the stamped envelope you send us, and we mail your letter to him. Then you're all set! Of course, if you want additional Pals, just write us again.

REGARDING FOREIGN PEN PALS

IN case you do not reside in the United States, write a pen pal letter as above, and send it *without* the stamped envelope but *with* an International Reply Coupon worth five cents. Your pal letter will be forwarded to an American correspondent, following which you need only wait for his reply.

If you are an American who wants a foreign pal *do not write a pen pal letter*. Instead send us a short note telling in a general way what kind of a chap you are, and what kind of a foreign pal you seek. *Enclose a self-addressed, stamped envelope and five cents.* A foreign writer's letter will be sent to you, then you may begin writing him direct from your own home. Foreign airmail pals are cared for in this fashion because foreign stamps sent in from other countries cannot be used in the United States to forward letters to Canada or across the seas.

Those of you who seek foreign pals will be given American correspondents whenever the supply is exhausted. Please note also that we cannot supply you with foreign pals in non-English speaking countries where FLYING ACES is not distributed.

For young Reichow had sent Air Mail stamps on his return envelope.

Another chap who sent his letter by airplane was Bob Singer, of Pana, Ill. Bob's a lad of twenty, "afflicted," so he says, "with aviation on the brain." He says he speaks "French, Italian, German, and some English."

Well, we had a whole hangarful of nice letters at the time, but the one most suited to Bob was written by Charles Hill, of Margate, Kent, England. A couple of years younger than Bob, Charley was born in the United States and was taken to England when he was two. It's a good thing, the R.H.P.D. is thinking, that Charley wasn't in Margate a few years earlier. For that city—and all the other "gate" towns along the coast of Kent—was right on the direct route taken by the German Gothas bent on bombing London during the World War. A whole heap of damage was done in those towns—including Charley's city, of course—by pilots who unloaded their eggs too soon or were forced to drop them when British defense ships "popped up."

Charley, incidentally, is secretary of a Margate model club. He's a collector of airplane pictures, too, and he claims to have a thorough knowledge of all British military and commercial airplanes. Try him out, Bob—and see if he has!

ANOTHER Airmail Pal letter comes from Bob Kringle, of Roxbury, Mass. Bob must have something up his sleeve, for he's very specific in that his pal *must* live on the little isle of Guernsey, one of the Channel Islands between England and France. Young Kringle is sixteen. He has the right hobbies to attract an islander, for he's interested in all outdoor sports and particularly in fishing and swimming.

Well, Guernsey's a small place, Bob. So we won't make you any promises. But if some Guernsey lad should write to you in care of the magazine, we'll certainly forward his letter to you *pronto*.

Here's a lad who wants pal mail sent direct—Lorne Barnewall, of 733 Woodland Ave., Verdun, Quebec, Canada. An F.A.C. member, Lorne wants to swap airplane snaps.

And now, lads and lassies, here's just a closing reminder. Don't forget that because of the additional labor now required for handling your Airmail Pal requests, the small fee of five cents must be sent for each pal you "order." This, of course, is in addition to your stamped, self-addressed return envelope. Read over the rules again. As usual, they're in the accompanying box. Happy landings!

THE RIGHT HONORABLE PAL DISTRIBUTOR.

Flying Aces Club News

* * *

By Clint Randall

National Adjutant, Flying Aces Club

LAST NIGHT, clubsters, I'd like to have had you all with me in the auditorium of a New York hotel, watching the screening of a short feature movie called *Air College*. Sponsored by the Army's "West Point of the Air," the film showed some mighty fascinating angles of the life of a flying cadet at Randolph Field.

I'll grant that the picture missed a heap of swell stuff that *should* have been included, but even without it, a chap couldn't help but feel a thrill as he saw some of the stages through which the "Misters"—as new flying kaydets are called—have to pass before they win their wings.

Captain Richard E. Cobb, Army Air Corps pilot, was there to explain the film and answer the many questions that were asked concerning life in the Army's flying school. The Captain's a reel flyer as well as a real flyer—he doubled for Wallace Beery in the actor's last flying picture..

The occasion was a special meeting of the Greater New York Chapter of the National Aeronautical Association, which is cooperating in the Army's nationwide drive to obtain new flying cadets. The reason I'm particularly sorry that a stack of you F.A.C.'s couldn't have been present is because a whole lot of you chaps are eligible for appointment as flying cadets—and don't know it! Captain Cobb had application blanks right there with him, and if you'd been able to fill out yours last night you'd already have been well "on your way."

The idea that a chap must be a super-man to get in the Army Air Corps, explained Captain Cobb, is "all wet." Of course, you've got to be okay physically and mentally. To start with, you must have at least two full years of college training or its equivalent. If you have actual credit for the two years, you're exempt from the mental exam, but there's no way in the world that you can skip the physical tests. You can't wear glasses—your eyes must be 20/20 and no waivers are made. And you must have no functional disorders. What's more, minor physical troubles—if any—should be taken care of before you apply for the examination.

If you can pass, there are plenty of vacancies at Randolph Field—*right now*—they're yawning wide open for you. So if you're between your twentieth and your twenty-seventh birthdays, are in good health, can satisfy Uncle Sam as to your educational requirements, and are anxious to become an active participant in the finest profession in the world—that of an aviator—your chance is before you. If you're not sure where to apply in your own vicinity, a letter to the Chief of the Air Corps, Washington, D. C., will bring you full information.

And if you "get in" and can stand the gaff, you'll be given flight training that will cost Uncle Sam just *sixteen thousand bucks* over a twelve-month period! When you graduate, you'll be given your wings, a transport pilot's license, and a commission as second lieutenant in the Air Corps Reserve. And then you may take your choice



Left: From Palmerston North, New Zealand, comes this shot of F.A.C. Cadet Ernie Parker. See those familiar gold wings on his left coat lapel? Right: Captain Dario Politella, Distinguished Service Medal winner and a member of the Flying Aces Escadrille, is the chap inside the zippered sweater. His pal is a member of Flight "A," F.A.C., Lawrence, Mass. Why didn't you tell us his name, Dario?

of a period of active service with a Regular Army sky outfit or go back immediately to civil life all prepared for a try at a job with a commercial airline.

AND now we hear from one of our newer F. A. C.'s—Private Jim Papailias, of Uncle Sam's "Devil Dogs," the United States Marines. Jim's reaching a goal that he's been aiming at for quite some time. A "gyrene" for nearly four years, three of which were spent in China, he's finally getting into a flying school.

Jim was a crew-member aboard one of the Navy rescue planes that rushed to the scene of that head-on crash between two PBY-1's off San Clemente, Calif., not so long ago. Maybe you saw his picture in the papers.

Leaving Jim Papailias and his S.O.S. mission, we'll run another *Mayday* section ourselves right now. Here's a call from M. Virginia Lee, a feminine F.A.C. who lives in Forest Hills, N. Y. Virginia's interested in an F.A.C. flight or squadron, and if she can get enough support around her part of Long Island, she'll start a unit herself. Write her c/o the Club. I'll see that your letters are forwarded. And by the way, Virginia is a live member—she wants to carry things through with a bang.

From Glasgow, Scotland, comes a similar call. J. H. Dickson—"the Black Hawk," as he calls himself—plans to start a Scottish Squadron. And with an enthusiastic chap like him at its head, there's no reason why his outfit shouldn't be a fast-revvin' success. Contact him at 212 Ashkirk Drive, Moss-park, Glasgow, S.W.2.

Harry Greenberg, of 26 Talbot Ave., St. Hilda, S.2, Victoria, Australia, is an F.A.C. who's been making models since he was six. That gives him a model-building career of just twelve years, for he's eighteen now. The first job he built was a "little heavy"—for he crossed a pair of clothes pins to make it. And now he's specializing in solid models and has achieved quite a reputation for himself. Harry, too, is S.O.S.-ing. So there's his local address, Victorians. Look him up

(Continued on page 67)

Want to get in the Army Air Corps?
Well, lads, there are still plenty of vacancies for those who can qualify, and the Army's out looking for young fellows to fill them. After seeing a special Randolph Field movie the other night, Clint Randall's wishing that he was back in his early twenties again! This month, Clint tells you about that movie and the general requirements for appointment as a flying cadet. And as usual, he winds up with the latest news about F.A.C. members throughout the world.

JOIN THE FLYING ACES CLUB

Honorary Members

President and Mrs. Franklin D. Roosevelt
Vice Pres. John Nance Garner
Casey Jones Rear-Admiral Byrd
Wallace Beery Capt. Eddie Rickenbacker
Al Williams Colonel W. A. Bishop
Col. Scaroni Major G. A. Vaughn, Jr.
Major von Schleleh Willy Coppens
Lieut.-Col. Pinsard General Balbo
G. M. Bellanca Walter H. Beech
Capt. B. Sergievsky Frankie Thomas
John K. Northrop Dwane L. Wallace
Colonel Roscoe Turner Josef Veltjens
Charles W. A. Scott Frank Hawks
Richard C. DuPont Donald W. Douglas
Maj. A. W. Stevens Major C. C. Moseley
Capt. O. A. Anderson Clarence D. Chamberlin
Major Fred Lord Mrs. Charles S. Baylles
Lieut.-Col. Theodore Roosevelt

Official Charters

F.A.C. Flights and Squadrons are recognized at GHQ only after they have received their official charters. These illustrated documents, printed on fine paper and portraying various features in the field of aviation, are excellent for framing and display. Their inspirational text is in keeping with the high ideals and aims of our Club. Each charter application must include a full list of proposed group members and their addresses. Each of these members must hold his regular F.A.C. card, obtained by clipping and sending in the membership coupon printed on this page. If applications are approved, Flight Charters are issued for 25c, and Squadron Charters for 50c. Send the correct fee with your application. It will be returned if the Charter is not granted.

WIN YOUR WINGS

Save This Whole Coupon for
CADET OR PILOT
insignia of the F.A.C.



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 (sixpence overseas).



All enrolled 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 mailing.

Send the Whole Coupon

regardless of which kind of wings you wish. Separate sets of coupons are needed for each insignia. The coupon begins where it says "Win Your Wings." Canadians send International Reply Coupon for 15c. British and other overseas readers send coin or coupon for one shilling. Only one pair of either kind of wings to a member. If yours are lost, send 25c for new ones (one shilling overseas). [78]

Do Your Full Share to Advance Aviation

To advance the cause of aviation, over 50,000 men and women, boys and girls, have banded together to form the FLYING ACES CLUB.

It is the easiest club in the world to join. Just clip the membership coupon, fill out, and mail it to GHQ with a stamped, self-addressed envelope. Your official card will then be forwarded to you. After joining, you can quickly win promotion and the right to wear the various insignia of the Club.

In the FLYING ACES CLUB there are two kinds of local organizations, known respectively as Squadrons and Flights. A Squadron must have eighteen members, including its leader. A Flight must have a total of six. You can start either of these groups in your own community by enrolling your friends in the Club, then applying for an official charter as detailed in the column at the left. Each member must hold an F.A.C. card.

Meetings and activities are conducted among the squadrons and flights according to the wishes of the members. GHQ has established no rulings in this respect, nor are there any dues or red tape whatsoever. The entire idea of the Club is a common meeting ground in an international organization for the lovers of aviation in its various phases. Many local Squadrons and Flights hold regular contests and public events. Many hold weekly meetings for model building, and instruction, and even regular flight training.

Awards and Escadrille

After the membership card, and Cadet and Pilot's wings, comes the Ace's Star. This is awarded for enrolling five new members, using, of course, a separate coupon for each. As an Ace, you are then eligible for membership in the FLYING ACES ESCADRILLE. Then you may win truly handsome awards. Among these are the Distinguished Service Medal and the Medal of Honor, two of the finest decorations the Club's professional artists have ever designed.

Any member who has reached the rank of Ace is eligible for membership in the FLYING ACES ESCADRILLE, an advanced organization which replaces the old G-2 unit and opens the way for participation in a definite program contributing to the forward movement of aviation.

To enroll, an Ace must apply direct to Escadrille Headquarters, giving his name, age, address, rank, and highest award already won in the Club, and enclosing a stamped, addressed return envelope. If he is approved for membership his instructions will be forwarded. Membership in the Escadrille is limited to American and Canadian members only, at present.

Special NEW Service!

This Aviator's Positive Identification Bracelet



Registration and Bracelet Only 25c!

A valuable identification service for F.A.C. members is now offered with our World War type aviator's bracelet. Every one now issued will bear a serial number—which is the key to your confidential identification record on file at GHQ. In emergencies where prompt identification is needed, this number may be sent to GHQ, and identification facts will then be furnished. When ordering, send your name, address, occupation and full physical description—age, height, weight, color of eyes, hair and complexion, etc., together with name and address of nearest kin. Overseas readers may receive bracelets and be registered for 2/- in coins or Int. Money Order for same amount.

Keepers of the Log

In order to keep in touch with GHQ, every squadron should appoint a member with a facility for writing as Keeper of the Log. It shall be the duty of the Keeper of the Log to send in regular reports of interesting doings of his squadron. His is an important job, because it is only by means of interesting squadron reports that life can be given to the monthly Flying Aces Club News.

Photographs, too, are an important consideration for the Keeper of the Log. Either the Keeper himself, or any other member with a camera, should keep a photographic record of the squadron's activities, for reference purposes, to show prospective new members, and to allow a selection of pictures to be sent to GHQ for reproduction in the Club News pages in our magazine.

The cost of film, prints, etc., would be a legitimate charge against the squadron's own treasury or could be covered by members' contributions. A number of flights and squadrons, incidentally, send us prints which have been taken, and completely developed and printed by members.

Correspondence

In all correspondence with GHQ where a reply is desired, enclose a stamped, self-addressed return envelope with your letter. GHQ receives thousands of letters weekly, and cannot undertake to answer all of them unless this rule is heeded by all members who write.

Stationery and Pennants

Due to popular request, we have ordered a new supply of F.A.C. stationery and official F.A.C. (paper) pennants. The stationery is of high quality with the Flying Aces Club letterhead attractively hand-lettered, and the price is amazingly low—100 sheets, postpaid for 25c. The attractive pennants (with glue on the back) sell at 6 for 10c or 20 for 25c.

We also have a new supply of swell silk embroidered insignia for cap and sweater. They're available at 85c per pair, or 25c for the sweater emblem and 15c for the smaller one for the cap.

July Membership Application

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 [78]

Street

City State

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

With the Model Builders



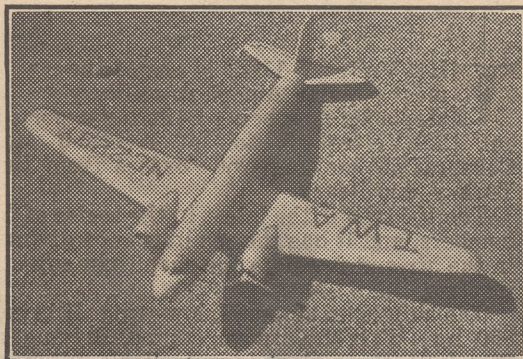
Howdy, fans? Despite the fact that this Curtiss P-6E is more than three years old, its "near-senility" doesn't seem to be affecting it with hardening of the arteries or anything of the kind. As a matter of fact, John Walter, of Washington, Ind., reports that the craft is flying better now than when he first built it. And by the way, John we're envying that camera of yours—it certainly "freezes" the action for a fine picture.



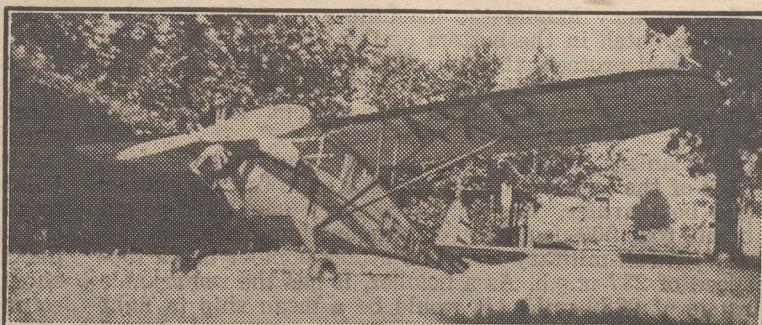
Left: Modelers, meet six-year-old Malcolm Shipman, of New York, N. Y. Malc, we believe, is F.A.'s youngest petrol-planer, and he's a real expert at flying this Brown-powered "Quaker Flash" built for him by his dad. The model is a sixty-seven-inch spanner, and Malcolm christened it the "Flying Ace" after his favorite sky-book. And are we pleased?



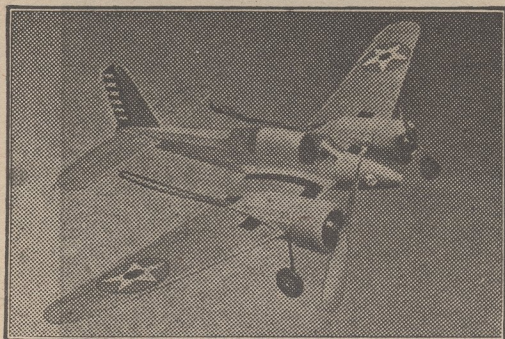
Up from Melbourne, Australia, comes this action "pic" of the Davis D1-W flying scale described by Henry Struck in F.A. for February 1937. Syd Clark, an Anzac member of our F.A.C., built the model, snapped the picture, and mailed it up to prove that our F.A. plans work out just as well below the equator as they do above it (but we'd known that all along!). Swell shot, Syd—and is that your dog near the fence-post?



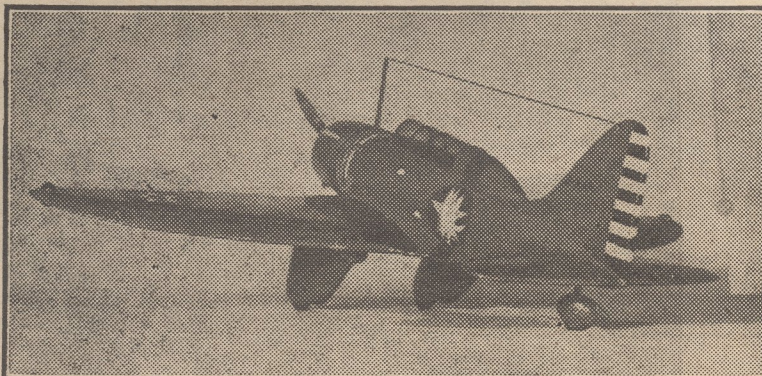
And here's another model built by an F.A.C. member. It's a Douglas DC-2, and its turner-outer is Cadet Meredith Johnson, of Reno, Nev. The job is a solid, of course, and "Merry" has scaled it at $\frac{1}{4}$ " to the foot. Nice work, kaydet!



Movable controls and a detail-built engine add to the realism of this five-foot spanned, rubber-powered Monocoupe 110. Keith Wyllie, who put the model together, is a senior in the aero engineering class at the Alberta Provincial Institute of Technology, Calgary, Canada. It's easy to see that he was utilizing his training in design when he turned out the model. "A swell flyer!" he reports.

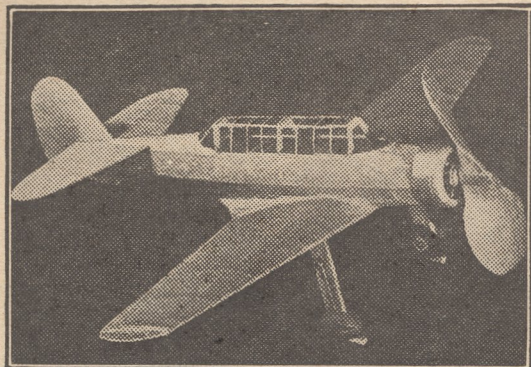


Ordinarily, this page is devoted entirely to the work of our reader-modelers. However, since so much interest was aroused by this Curtiss A-18 attack job—our featured model in the June issue—we asked Herb Weiss, who designed the model, to give us this additional shot as a further help for the lads who haven't yet completed their construction. Thanks, Herb!



Very evident is the extreme care taken by Henry Frauenthal, of Mineola, N. Y., when he built and photographed this detailed Seversky solid. He made the picture with an ordinary folding Kodak and Agfa Plenachrome film. He used a flat silver mat for background, placed a photoflood bulb at each side of the camera, set the diaphragm at F.32, and made an exposure of five seconds. Excellent! And we'll show you more of Hank's pictures in the future.

Only the enlarged tail surfaces and the two bladed prop (instead of a three) keep this neat production by David Grant from being an exact scale model of the original Vultee export job.



Latest Attack Bomber For Export

All-metal and powered with an 850 h.p. Wright Cyclone engine, this latest production of the Vultee shops is proving one of the most popular American export jobs of recent years. The Vultee plant is packed with ships being built for Russia, China, Turkey, and Brazil, and additional orders are pouring in almost daily. Such a ship is bound to be of interest to the readers of *FLYING ACES*, so for that reason David Grant dug up all the available dope and we're handing it to you now in this outstanding article.

Build the Vultee 11GB

THE Vultee V-11GB is one of the most popular American military airplanes now being built for export, and at present the Vultee division of Aviation Manufacturing Corporation has numerous orders from Russia, China, Turkey, and Brazil.

The V-11GB is the latest in the series of Vultee attack bombers, and it has the reputation of giving more hours in the air and fewer in the shop than any other plane in its class.

The ship is an all-metal, low-wing. It is powered by an 850 h.p. Wright Cyclone engine, driving a Hamilton-Standard three-bladed controllable pitch propeller. It carries a crew of three—pilot, rear gunner, and bombardier. The rear gunner is also co-pilot and radio operator. The bombardier, besides doubling as photographer-observer may handle the machine gun which operates from a hatch in the bottom of the fuselage behind the wing, and protects that once-vulnerable spot under the tail. Thus the new Vultee has no blind spots where an enemy plane might sneak up without meeting hot lead.

Armament consists of four fixed guns in the leading edge of the wings and the two rear guns for the gunner and bombardier. The ship can carry one 1,100-pound bomb, four 300-pounders, or nine one-hundreders.

With full military load this attack-bomber has a top-speed of 237 m.p.h. As a bomber, it has the remarkable range of 2380 miles. It would be a mean ship to fight against in any man's war. With its range, speed, and

By David Grant

armament, it's an easy job to defend.

BUILDING THE MODEL

OUR model follows the design of the original ship, except that the tail area is greater, and a two-bladed prop is used instead of a three, for better flying results. Before starting, study the plans carefully.

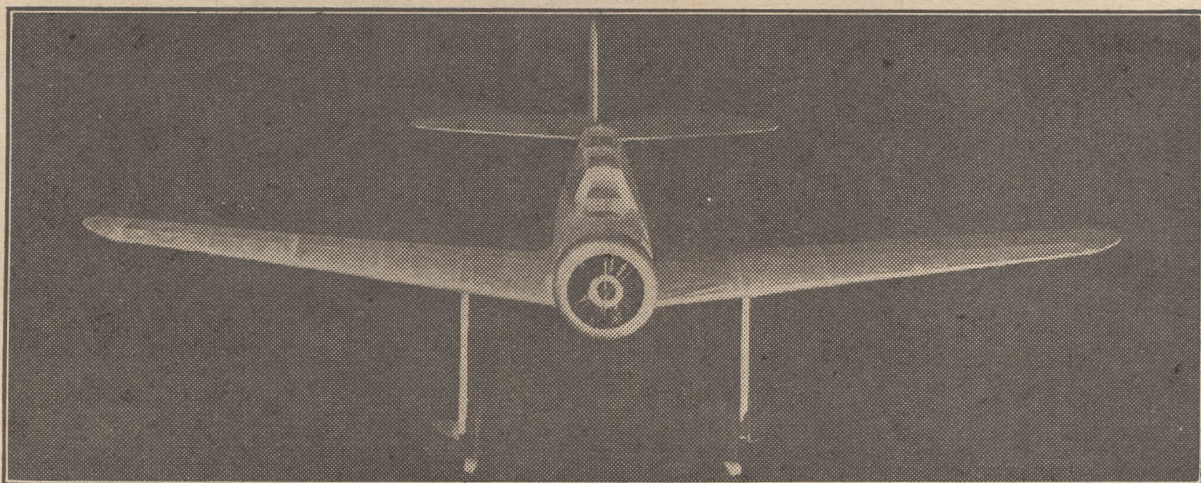
Begin by cutting the keel piece, K, and bulkheads Nos. 1 to 11 from 1/16" medium hard balsa sheet (See Plates 1 and 2). Notice that bulkheads Nos. 3 and 5 are identical. Nos. 4 and 6 are identical, also, except that No. 6 is cut out slightly on the side, while No. 4 has straight sides, as shown.

Have the grain vertical in all bulkheads except Nos. 4 and 6. These should have the grain horizontal to give greater strength at the wing connection.

Mount bulkheads Nos. 2 to 7 on the keel. Use plenty of glue, and be sure that all are lined up true and in their correct respective positions. Next curve a strip of 1/16" by 1/16" balsa to conform to the bottom curve of the fuselage rearward from bulkhead No. 8 to the tail, and glue it into the notch at the rear of the keel.

Glue the center side stringers into the notches in the bulkheads, and then add bulkheads Nos. 8 to 11. Use care to align them accurately. (This is a good time to shape the tail hook from music wire and glue it firmly through bulkhead No. 10). Add the upper side stringers and the short top stringer. All stringers, incidentally, are 1/16" sq. medium hard balsa.

Next cut seven nose "spacers" (see C on the drawing)



"Slick as a whistle" is the best way to describe this model. And the big ship herself can "whistle" along on a bombing mission for the startling range of 2,380 miles—and with a half-ton of bombs, too! Newest in the long line of Vultee attack-bombers, the V-11GB lends itself willingly for modelers' purposes, and the fact that a swell miniature can be made is plainly evident in this picture.

and cement them at equal radial spacing to the front of bulkhead No. 2. When they are dry, cement bulkhead No. 1 to the seven spacers and the keel.

Next add the fillet stringers of 1/32" sq. balsa, as indicated by the heavy black line on the side view. Cut the notches for these as you go. These stringers meet at the junction of the keel and No. 8 bulkhead. Add the lower side stringers, also of 1/32" sq. rearward from No. 7 bulkhead and the junction of the fillet stringers to the tail, cutting these notches as you go, too.

Add the short 1/16" by 1/16" stringers D between bulkheads Nos. 2 and 3, cover sections W and X with stiff paper cut to the windshield outlines, and the fuselage frame is complete.

MAKING THE MOTOR

THE cowl is made from five discs of 1/8" medium soft sheet balsa, one with a 1/4" hole in its center (B on Plate 1) and the other four each with a large hole (A on the plan). Cut out the center holes before shaping the outside circles to prevent splitting.

Glue the five discs together, crossing the grain of each disc with that of the previous one. Sand perfectly smooth and round. Round off the edge at the front, being careful to take material only from the first two discs. Cut a 1/2" strip of thin bond paper and carefully glue it around the cowl so that it extends 1/8" behind the rear disc. Give the cowl two coats of clear and one coat of silver dope, sanding lightly between coats. Finally, blacken the inside.

Start to make the motor by cutting four discs of 1/8" sheet balsa for the crankcase. These discs should be of 1/2" diam., each with a 1/4" hole in the center. Assemble them in the same manner as the cowl. From a 1/4" round dowel, cut off nine short lengths for the cylinders. These must be slightly flattened where they touch at the base for all to fit around the crankcase. After they have been glued to the crankcase, add two push rods of 1/32" sq. to the front of each cylinder (See Plate 2) and blacken the entire assembly.

Cement the motor inside the cowl, and fit it with an ordinary hardwood noseplug.

The tail wheel housing is made from three strips of balsa, one of 1/8" sheet and two of 1/16" sheet, cut to the outline as shown at T on Plate 2. Cut out the 1/8" center piece to receive the tail wheel, glue on side pieces, and finish housing by rounding the nose and streamlining the rear down to the thickness of the 1/8" center piece. The tail wheel is made of two discs of 1/16" sheet cemented together cross-grain. Blacken the wheel and "silver" the housing, and set the wheel in place with a short length of wire.

WING AND TAIL

CUT out the spar center pieces SF and SR (Plate 2). Be careful to cut them accurately, since the "fit" of the wing and the correct dihedral angle depend upon them. Cut two 8 5/16" strips of 1/16" sheet balsa. Taper them in width from 1/4" at the root to 1/16" at the tips and cement them securely, in spar form, to the bottom edge of SF. Two strips of 1/16" by 1/16" are similarly cemented to the bottom edge of SR.

In the real ship being built by Vultee for export purposes, that long "office" enclosure would accommodate a three-man crew comprising pilot, bombardier-observer, and co-pilot-radio operator. In the model, it gives your pals a chance to see what kind of a detail-modeler you are. So you'd better be good!

BILL OF MATERIALS

(Complete plans will be found on the following pages)

Two pieces 1/16" by 2" by 18" balsa for bulkheads, ribs, outlines, etc;
One piece 1/8" by 2" by 18" balsa for cowl, wheels, and landing gear;
Twelve pieces 1/16" by 1/16" by 18" balsa for stringers and spars;
One piece 1/16" by 1/8" by 24" balsa for trailing edge;
One piece 1/8" by 1/8" by 24" balsa for leading edge;
One piece 1/4" by 1/4" by 6" balsa for motor;
Four pieces 1/32" by 1/32" by 18" balsa for stringers and push rods;
One piece 1" by 1 1/2" by 7" balsa for propeller.
One sheet of silver tissue; music wire, washers, glue, dope, celluloid, rubber, and a sheet of bond paper for the cowl and wheel covers.

Next cut two each of ribs R-1 to R-6 (Plate 3) and two "false ribs". These last are duplicates of the portion of R-2 from the leading edge to the front spar, where they are cut off. All ribs are cut from 1/16" flat.

Set the ribs on the spars at the proper positions as determined on the drawing, and note that the ribs are not perpendicular to the spars, but become vertical when the wing is in place on the ship. This is particularly important on Rib 2, since this rib carries the landing gear strut and must be accurately placed to make the finished job neat.

When all the ribs are in place, add the spar top strips of 1/16" sq. Then taper a pair of 1/8" sq. strips, 8" long, from full size at the roots to 1/16" by 1/8" at the tips. Cement these in the slots cut at the front of the ribs for

the leading edge and round them off with sandpaper when dry. Add a short piece of 1/8" by 1/8" between the R-1 ribs for the center section.

Sand down strips of 1/16" by 1/8" balsa for the trailing edge, and glue them in place. Cut the wing tips from 1/16" flat balsa and glue in place. This completes the wing.

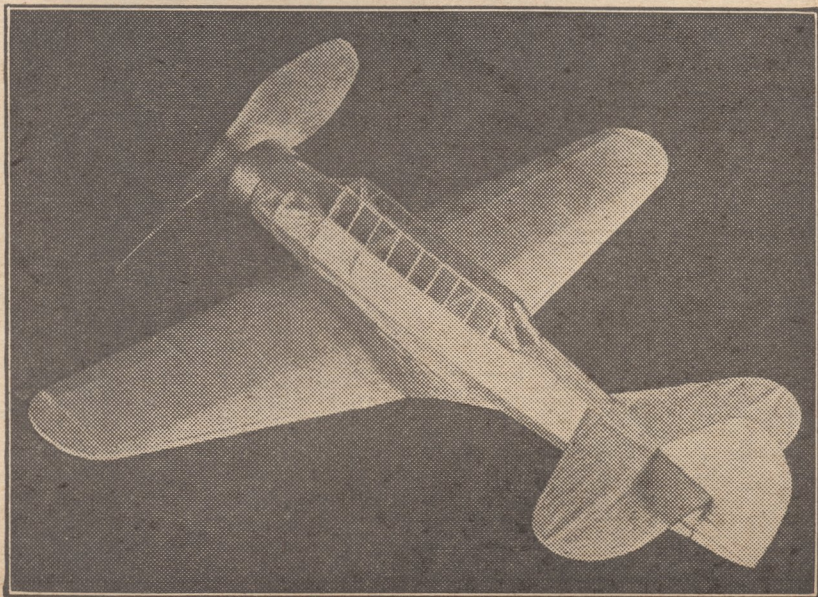
The tail spars are of 1/16" by 1/8" stock. So also are the ribs, which are tapered to form after assembly. The straight edges are 1/16" sq., and the curved parts are cut from 1/16" sheet. The cone at the bottom of the rudder is made from a circular bulkhead (Plate 2) and four strips of 1/16" by 1/16". The tail wheel fairing below the cone is cut from 1/8" sheet, tapered to 1/16" at the rear, and the edges rounded off on the bottom with very fine sandpaper.

For the landing gear legs, cut two strips of 1/8" by 1/2" hard balsa to the length shown in the front view on Plate 2. Be sure they are exact. Hold them in place against ribs R-2, and glue the "false ribs" against them for a snug fit. The landing gear legs, however, are not to be glued in place until after the wing has been covered on the bottom.

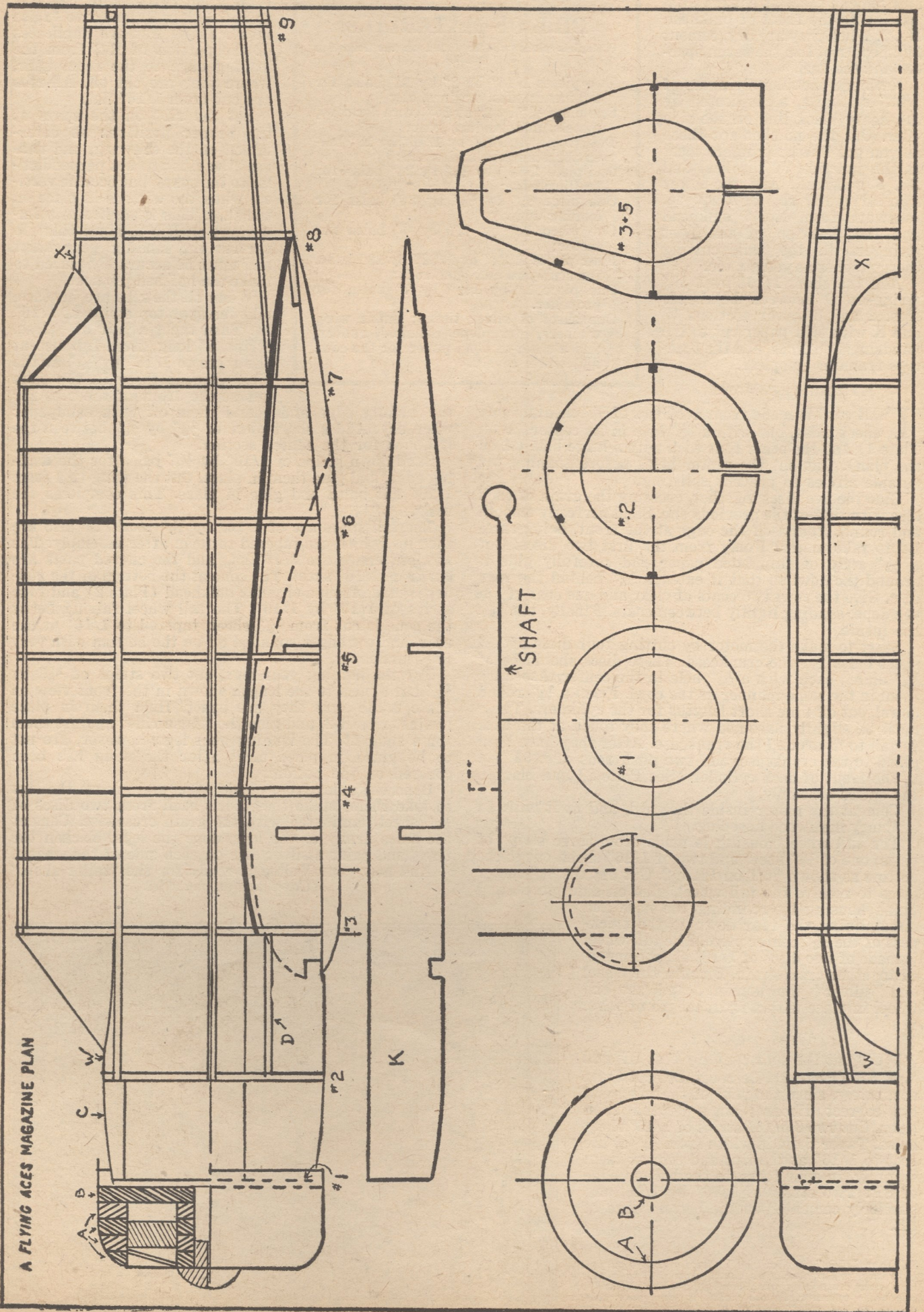
Bend the axles from music wire, and groove the legs to take them. Make the wheels each from two discs of 1/8" sheet, laminated with the grain crosswise. Cement the axles firmly to the legs, dope the legs, blacken the tires, and paint a silver disc on each side of the wheels.

And now your Vultee is ready for the "tailor shop."

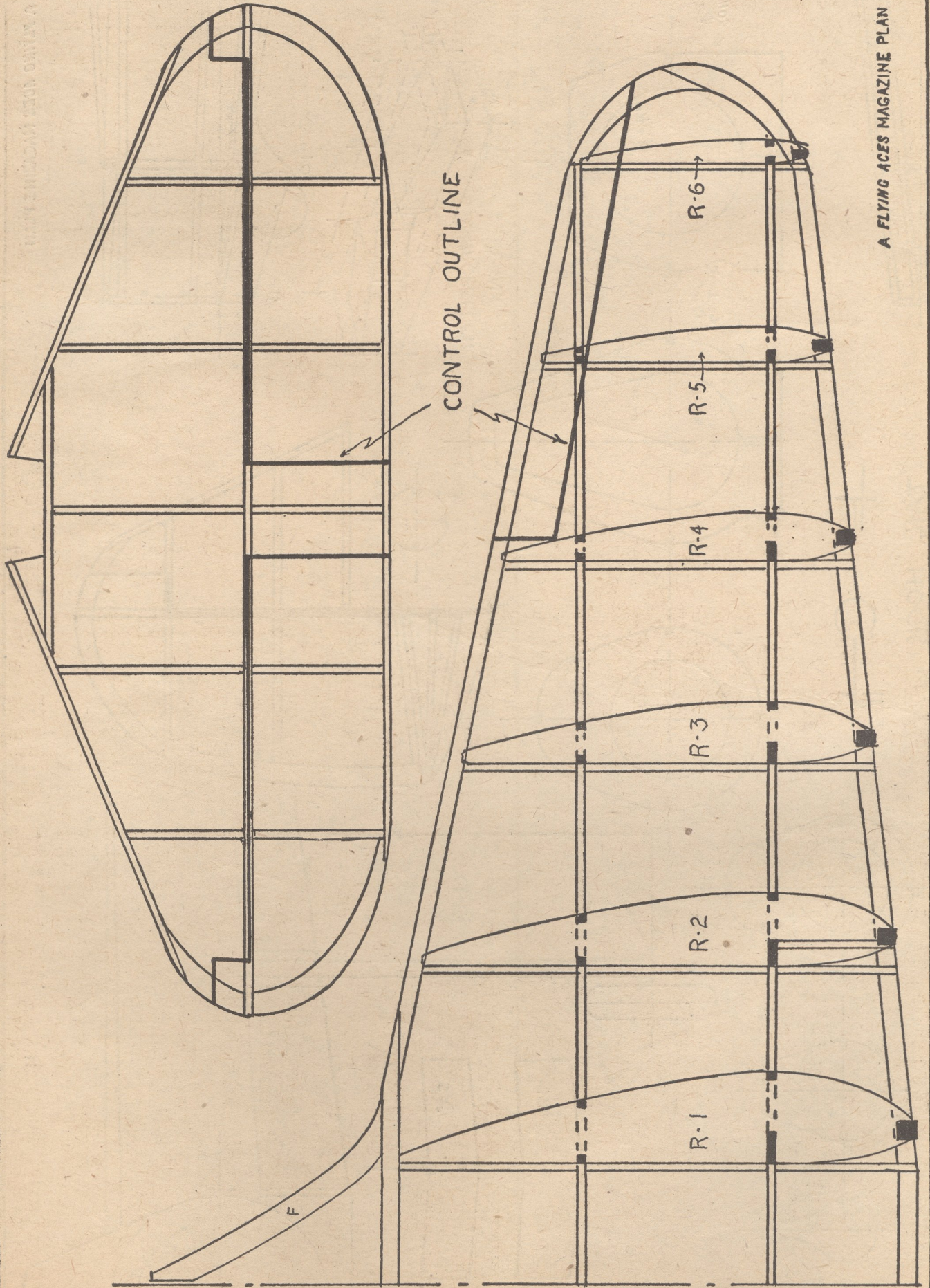
(Continued on page 79)



A FLYING ACES MAGAZINE PLAN







This Ship's "Got Everything!"

Fast and reliable, durable, neat, and easily-built, this new outdoor record-chaser by "Skates" Gutmann is a ship you'll be proud to own. She'll fly to your full satisfaction and she'll come through every time. What more do we need to tell you? Just read through the instructions carefully, turn the page for full plans, and you'll be all set to clear off your bench and go to work!

Here's an

Outdoor Endurance Job

By Felix Gutmann

UNDER almost any weather conditions when flying is at all possible, this endurance job will give you extremely satisfying results. I know you will never regret having spent the time and effort to build it.

The ship is fast and has excellent climbing qualities, zipping up to 200 feet in just a few seconds. Even with her speed, however, the model is very stable. And as you can see from the accompanying pictures, it presents a sleek enough appearance to satisfy the most discriminating modeler. Moreover, being quite small, the model will hardly "bust the bank" of the modeler who essays to build it.

There is nothing difficult about building this job, but just the same we recommend that especial care be taken to insure that everything is done *right*.

CONSTRUCTION

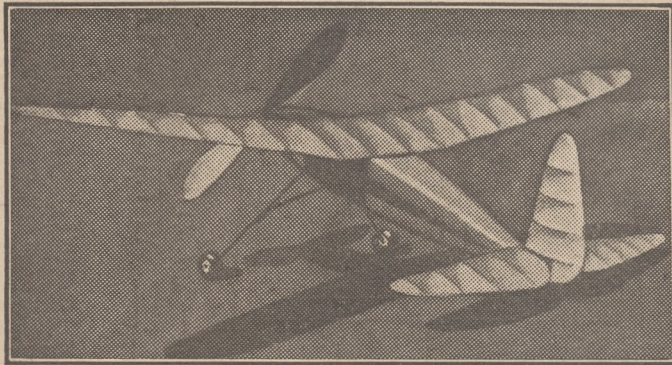
JOIN together the two sections of the side-view on Plate 1, which is full-size. Lay the completed plan down on your workbench, cover it with waxed paper to protect it from cement, and build up two sides on it from 3/32" sq. strips of medium balsa. When they are quite dry, cement them together at the tail to the angle shown in the half-size top view on Plate 2.

Now, make three tail hook bulkheads from 1/32" sheet balsa and laminate them. Two of these bulkheads should have the grain running horizontally (see Plate 2). The piece with the vertical grain should be in the center when all are glued together. Make a tail hook of .34 music wire and embed it in the bulkhead.

Cement the bulkhead in position between the two fuselage sides. Then cut all cross-braces according to dimensions taken from the half-size top view and cement them securely in place. Don't skimp on the cement.

Cover the body with 1/32" medium balsa sheet, starting on the two sides and then covering the top and bottom. While you can do both sides

Rangy as a greyhound and a whole lot faster in bad weather, this sleek sky marathoner will take 800 turns in her motor and keep on flying while you go home for lunch. Just keep your eye on these pictures while you build your model, as an aid in lining her up.



at a time, your best plan is to apply cement generously to all parts of the framework on one side and lay a sheet of balsa 3" wide and about 18" long on top of it. Press the balsa in place and hold it down with pins stuck all around the edges.

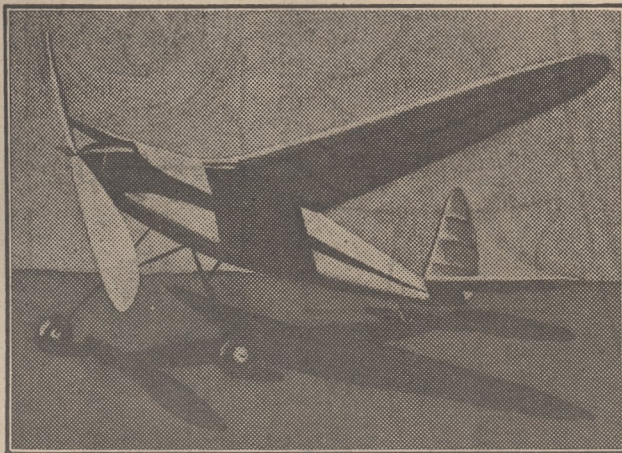
Allow about 15 minutes' drying time (overnight if you can bear to wait that long) before trimming off the excess balsa with a sharp razor blade. Then do the other side. If you don't possess the patience that all good modelers *should* possess, you can glue the balsa to the sides, press it into place and add the pins, and then trim off both sides at the same time an hour or so later.

When sheeting the bottom of the fuselage, use 2" wide stock. After the entire body is covered, round all the longitudinal edges with sandpaper.

Now cut a noseblock and sand it down on the body to give "that molded appearance." Cut away enough of the sheeting at the tail to allow insertion and thorough gluing of the tail incidence block. And in the position shown by the black outline surrounding the tail hook on Plate 1, cut an opening in the sheet and make a door of 1/16" hard sheet balsa. Sand this down with the rest of the body.

Finish off the fuselage by first sanding with 10-0 paper and then applying four coats of banana oil with intermediate sandings. This should give you a satisfactory sleek finish on which you may add decorative strips or other desired details.

Hinge the tail hook door in place with strong paper, silk or adhesive tape over its "leading edge" and glue a small knob at the edge toward the tail.



She's ready for action, fellows! And action is just what you'll see when you turn loose your Gutmann endurance job. For she's as fast as she is dependable, and you'd better have plenty of red and silver coloring on your job so's you can keep her in sight.

LANDING GEAR AND PROP

PLATE ONE shows the landing gear in detail, and the wire parts can easily be made from it. The wheels are each made with two disks of 1/8" hard sheet balsa cemented together with the grain at right angles. When the glue is dry, the edges of the discs should be nicely rounded and then bushings glued on each side of the axle holes. Finish the wheels down smoothly, paint them the desired color, and slip them over the axles. Hold them in place with a dab of cement.

(Continued on page 67)

FUSELAGE
—SIDE VIEW
FRONT END

RUBBER
TUBING

.034 WIRE

BOTTOM VIEW—LANDING GEAR
ATTACHMENT

WIRE "U" BRIDGES
CEMENTED INTO
GROOVES CUT IN
HARD CROSS-BRACES.

HARD STOCK
THREAD
TOTAL
LENGTH=8"

NOSE

FUSELAGE STOCK: $\frac{3}{32}$ " SQ.

EACH LEG— $6\frac{1}{2}$ "
TOTAL LENGTH
 $15\frac{1}{2}$ "

SOLDER, BIND, & CEMENT.

DOOR OUTLINE. BODY COVERED
WITH $\frac{1}{32}$ " SHEET

RUDDER

TAIL SKID.
(BAMBOO
 $1\frac{1}{2}$ " LONG)

PROP

WINDING
HOOK

'FREE
WHEELING
DEVICE

WASHERS

WHEELS

$\frac{1}{8}$ " SHEET
LAMINATED
CROSS-GRAIN

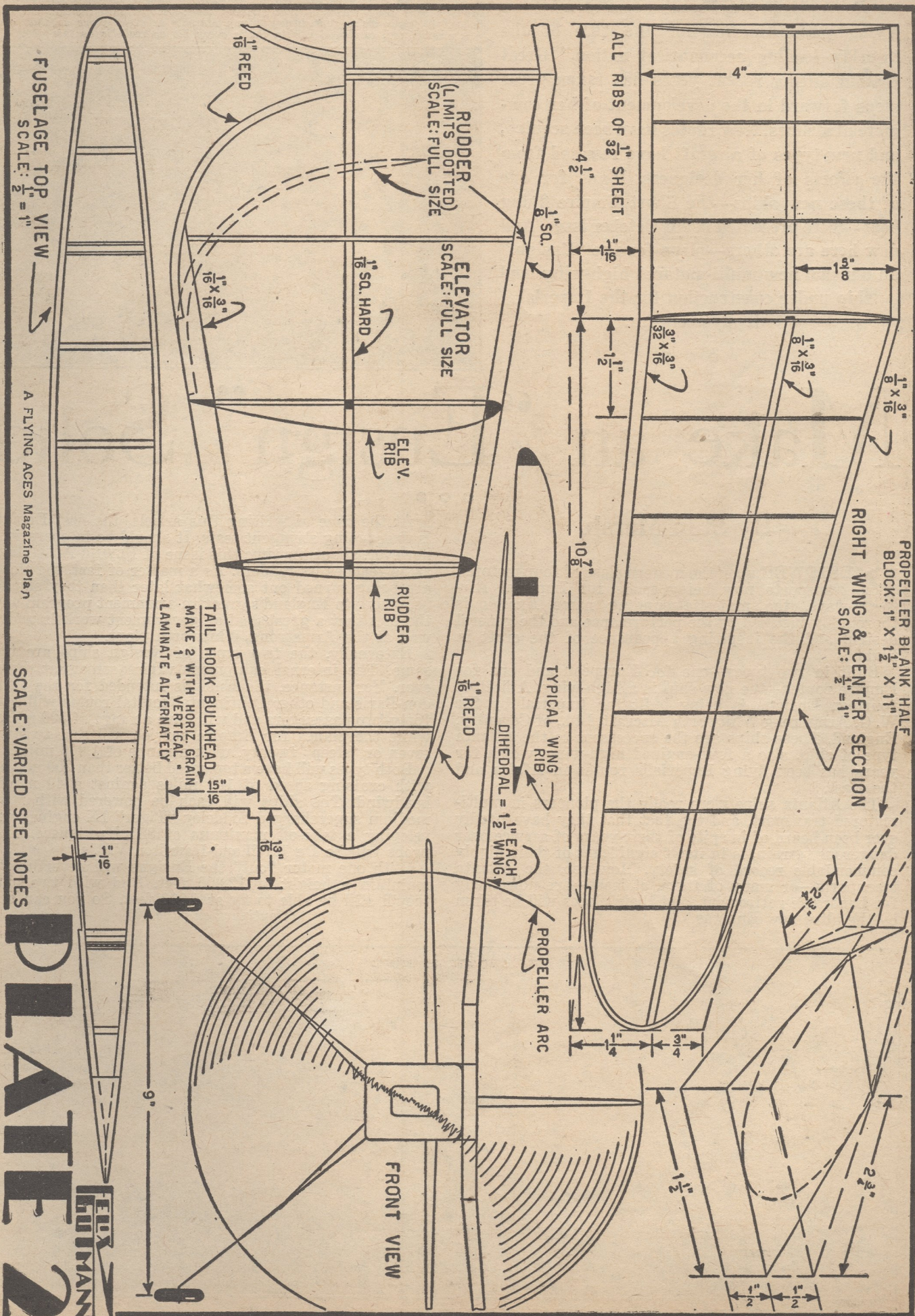
FUSELAGE

SIDE VIEW

TAIL
END

FELIX
GUIMANN
PLATE 1

SCALE: FULL SIZE



Britain's Newest Transport

Vying with America for the title of the "world's leading aeronautical nation," Great Britain during recent years has taken great steps forward in the development of her commercial airlines. New routes have been scouted, and new types of aircraft have resulted from the efforts of her designers. Plans for one of these new ships—the Short Empire flying boat—were presented in our October issue. And now here are others—plans for the "Ensign," an unusual new multi-motored high-wing land ship under construction for the Imperial Airways concern.

Make an "Ensign" Solid

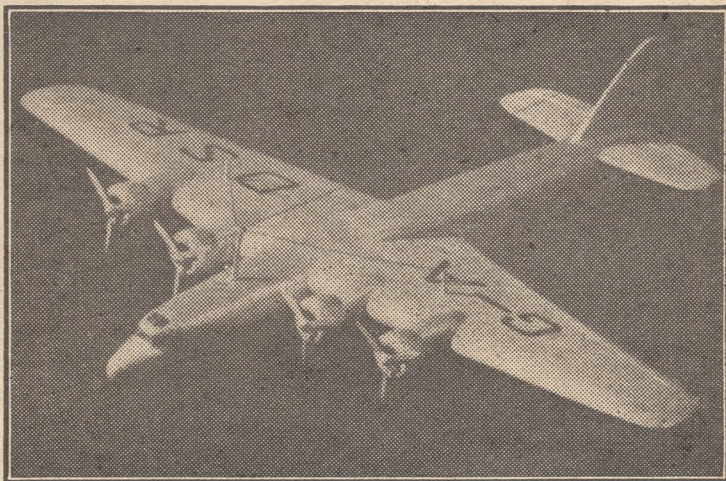
By Stan Marsh

BESTOWED upon the modern class of four-motored transports now being made for Imperial Airways, the majestic-sounding name *Ensign* is thoroughly justified by the performance and the general design, and the inspiring appearance of the craft in flight.

Built in two types—one for European and one for Empire routes—the new ship is a high-wing. A fleet of fourteen Ensigns is being built for Imperial by Sir W. G. Armstrong Whitworth Aircraft, Ltd., of Coventry, England. These ships are the successors to the Atlanta type of ship, also a four-engined high-wing, which for years has been flying Imperial's routes in Africa and the East.

The Atlanta ships were really the pioneers in multi-motored transport, and the fact that they have hardly ever been heard of in spite of their years of service over dangerous terrain, is in itself significant of their highly commendable record of safety. However, the Atlanta transports—or many of them, at least—are now ready for honorable retirement, and their places will be taken by the ultra-new Ensigns.

Deceiving indeed is this picture, modelers. For while it might easily be taken for a shot of the real Imperial Airways' "Ensign" plane, it actually shows Stan Marsh's solid scale model of that striking multi-motored ship instead. On the following pages we're reproducing young Marsh's excellent plans so that our readers, too, can build a ship that's every bit as realistic as this one.



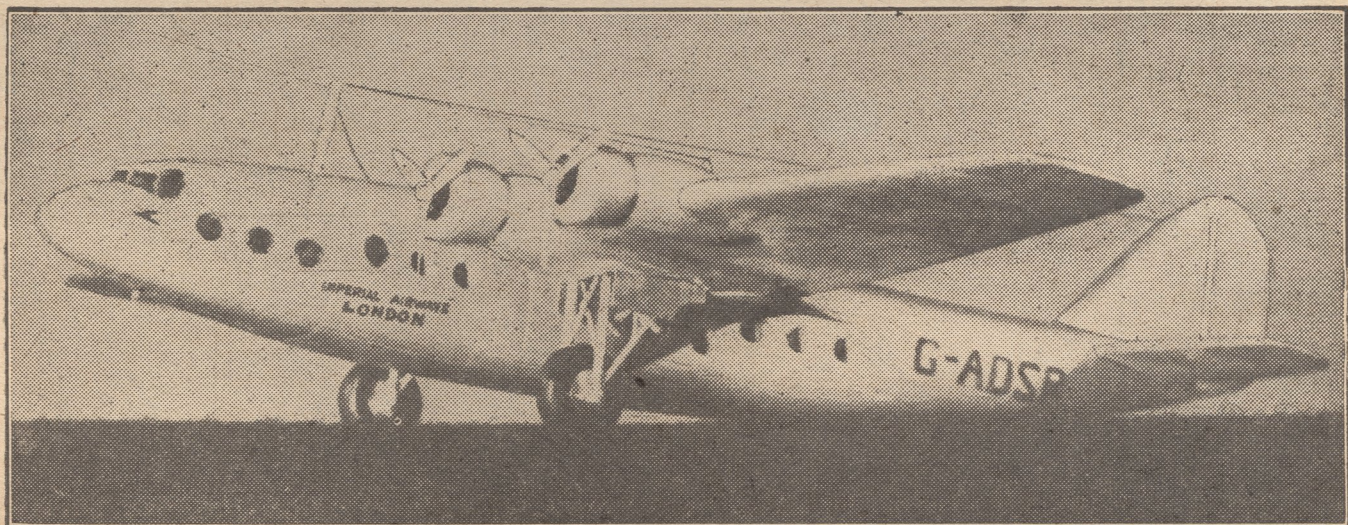
At the time of writing this article, the first Ensign is undergoing stringent tests. It should be in operation, however, about the time this issue of FLYING ACES Magazine reaches its readers. As a matter of fact, the ships are being turned out somewhat later than they should be, owing to England's great re-armament program and the fact that a great deal of government work is under way at the Armstrong Whitworth plant.

Externally, the two types of Ensign ships are the same. The internal equipment varies somewhat, however. For instance, the Ensigns intended for the London-Paris and other Continental capital routes will seat forty-two passengers and will have a range of 500 miles, while the planes for Empire service will seat twenty-seven or "sleep" twenty, with a range of 1,000 miles.

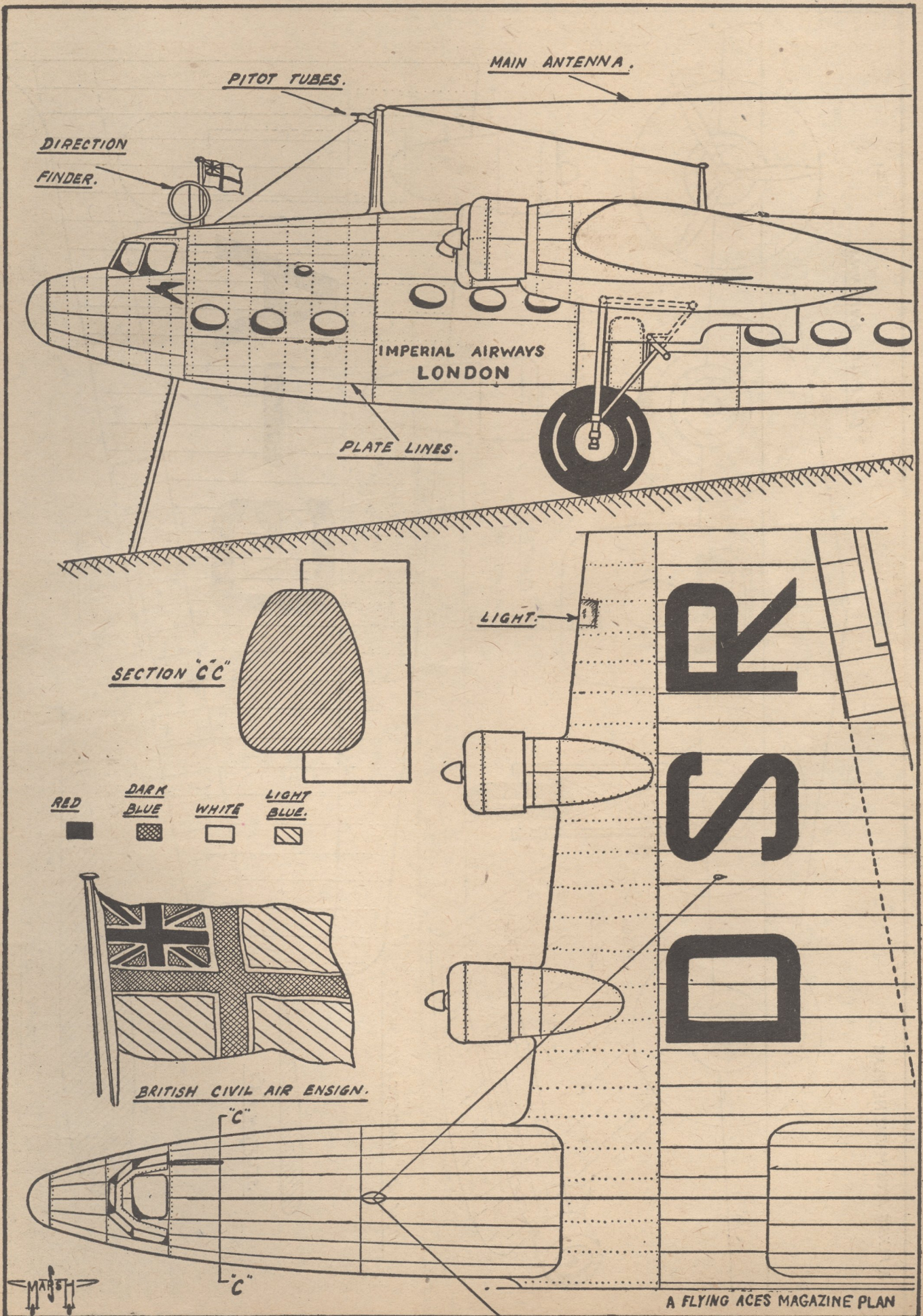
Both types will have a top speed better than 200 m.p.h., with cruising speed of 160 miles against a 40 m.p.h. headwind. The ships will each be powered with four medium supercharged Siddeley "Tiger" IX engines developing a take-off maximum of 880 h.p. apiece. The props will be De Havilland-Hamilton V.P.'s.

With one motor "out" the Ensigns will nevertheless maintain a height of 12,000 feet. And with two out, they'll still be able to fly at 4,000 feet. So you can see

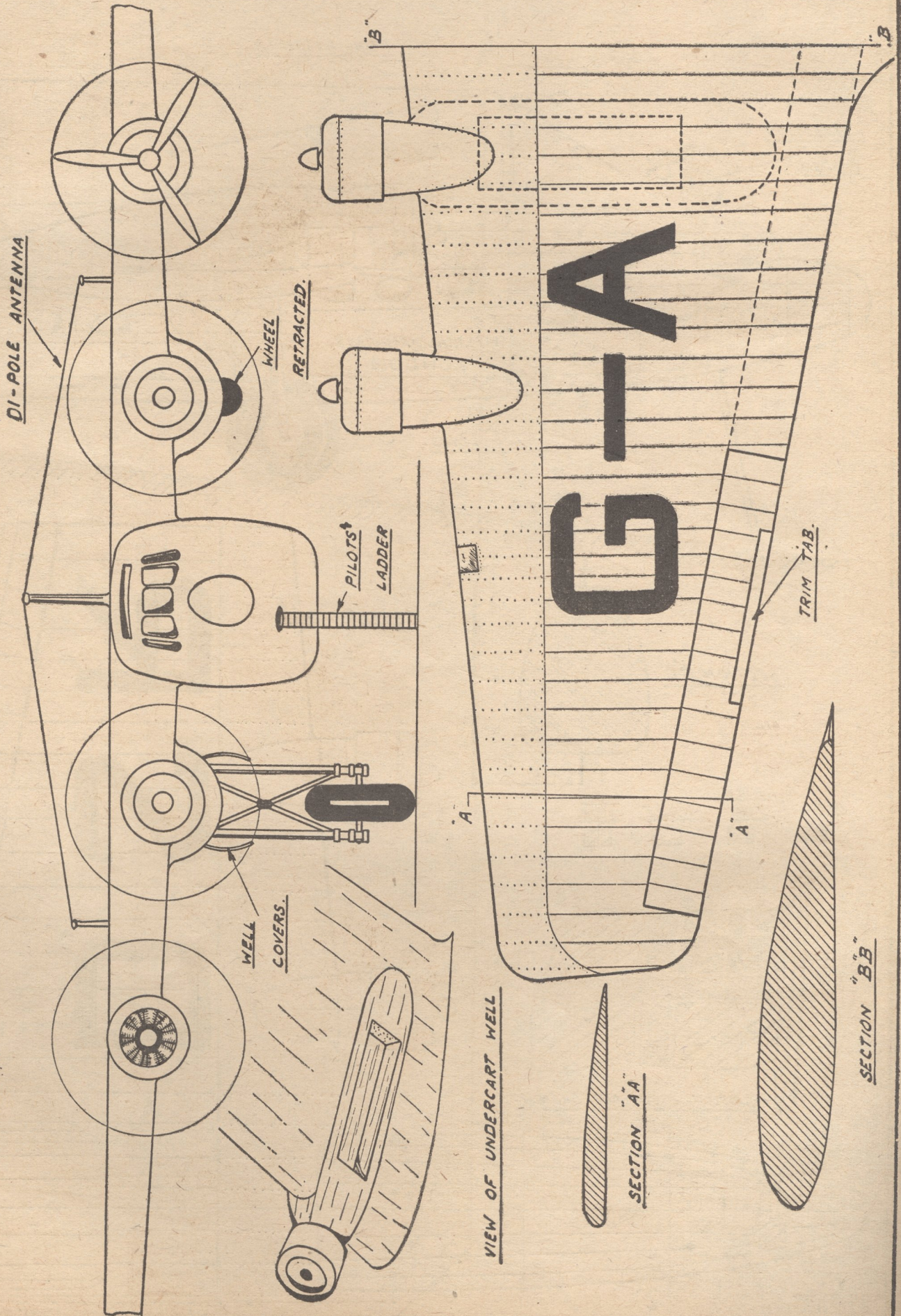
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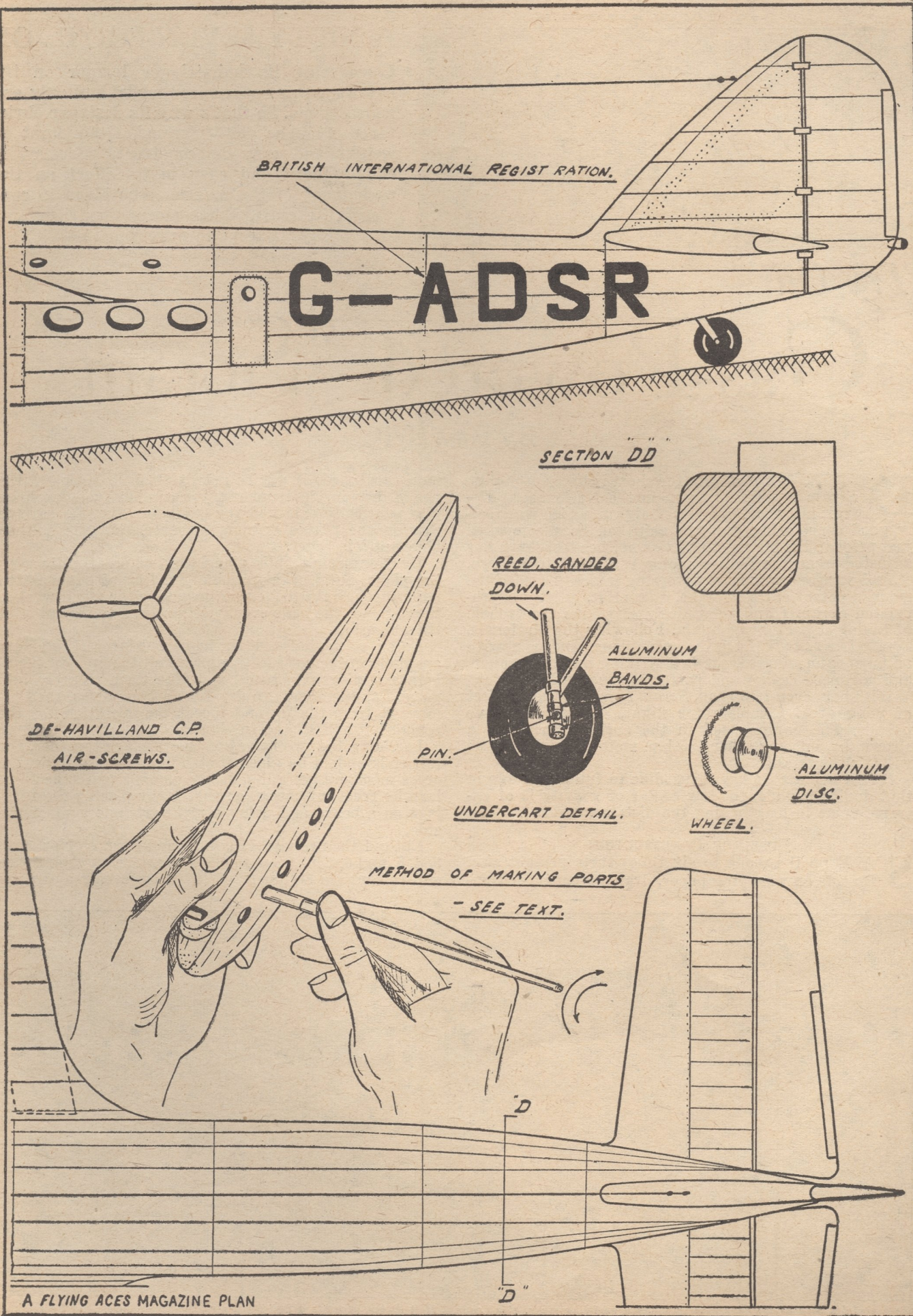


This sturdy display model is scaled at one-eighth-inch per foot, its span measuring 15½ against the 123-foot span of the original "Ensign" after which it was patterned. Details of the engine nacelles, props, radio aerial, and general outline of the ship are portrayed in this photograph.



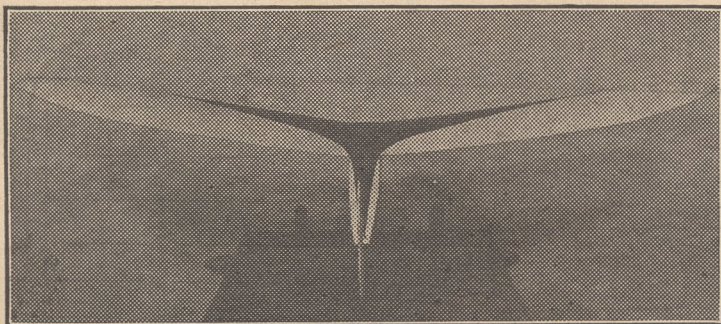
A FLYING ACES MAGAZINE PLAN





Light in weight, and smartly streamlined, Ray Heit's swanky petrol plane is built for speed—as you can easily see in this rear-view shot. The wing area of "Scram," by the way, is six square feet.

✱ ✱ ✱



A NIFTY SEVEN-FOOT JOB

Considering its hair-trigger temper on the getaway, this super-speed model had only one logical name. So that's why its designer christened it as he did—"Scram." Quite light in weight and easy to construct, "Scram" is equally light and easy in its effect on the pocketbook of the modeler who plans to construct the craft. What more, then, need we say? Except to urge you to—

Try Our

Gas-Powered "Scram"

By Ray Heit

DESIGNED exclusively for short motor run flights, *Scram I* was first flown in the Nationals at Detroit last year. She placed eighth, which was really good considering that the ship had been completed just prior to the big meet and was neither test-flown nor adjusted when the limited motor run event took place.

And someone was *most* favorably impressed with the model's potentialities, for he, she, or it, quietly appropriated *Scram I* and very nicely saved me the trouble of taking it back home again. Following the Nationals, *Scram II* was built from the same plans. And now, with all bugs exterminated, she is a striking model of unique and advanced design and performs excellently.

With her seven-foot span, *Scram II* has six square feet of wing area. Complete for flight, she weighs three pounds. The engine used in the author's model is a Brown Jr., but any other 1/5 h.p. motor of similar type will "do the trick."

Scram utilizes its low thrust line to full advantage in that during a glide, the low center of gravity is of extreme value in lengthening the distance covered.

FUSELAGE CONSTRUCTION

SCALE up the plans to six times their present size. Do this on wrapping paper, drawing paper, or com-

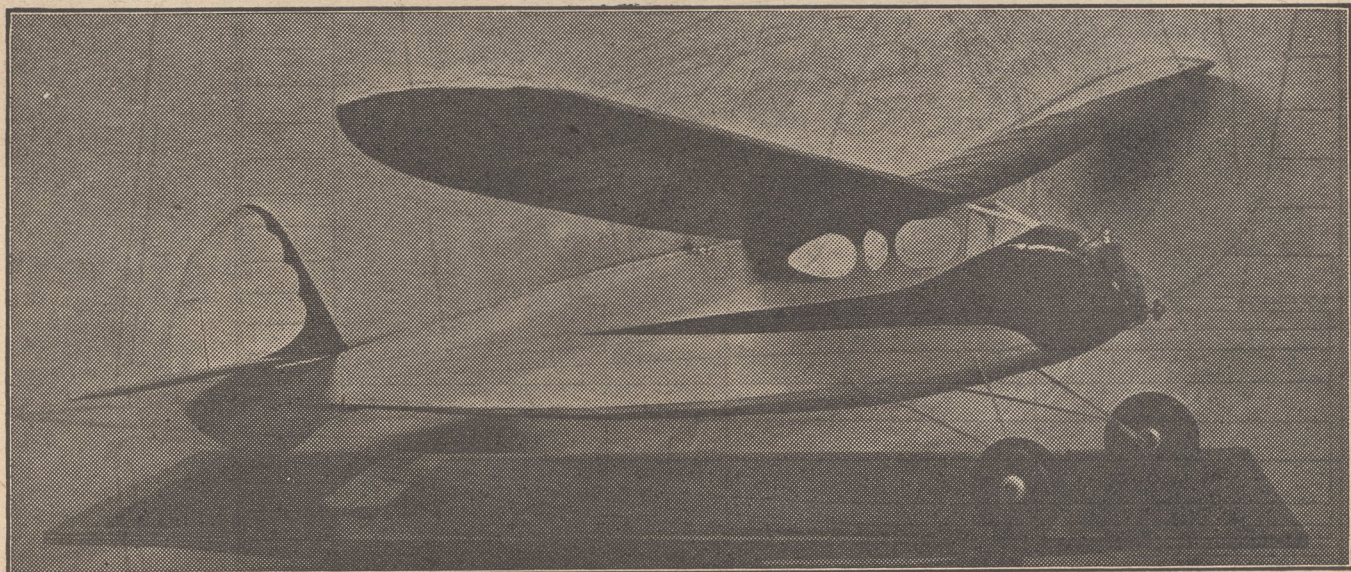
mon cardboard. If you're not particularly adept in the use of drawing instruments, you can have the drawings photostatically enlarged for quite low cost. Be sure to caution the photostat man, however, that the sixtime "blow-up" is *exact*.

By hammering nails along the longeron outlines on the plans, build up a fuselage jig. Do not hammer the nails through the longerons themselves or you'll weaken them. Space the nails evenly with regard to the curve of the longerons.

Using 1/4" sq. balsa, fit the longerons into the jig. Next assemble in their respective places all the upright members and diagonal braces, and glue them securely into place. Let the structure dry for an hour or so, then remove it from the jig and repeat the operation for the remaining half of the fuselage.

In gluing the two halves of the fuselage together, the tail ends should be glued first, followed by placing the cross members according to the plans. Square the fuselage by frequent checking; that is, by placing the fuselage on a board and using a right triangle against the side.

Cut out the fire wall (Plate 1) and formers Nos. 1, 2, 3, 4, 5, and 6. Glue them in place as shown on plan. Space and cement six stringers of 1/8" balsa evenly along the



As graceful a ship as we have seen in many a modeling moon, this original Heit design presents a decidedly striking appearance. And its red-and-cream color combination makes it an easy craft to follow, regardless of the color of the sky on flying days. The bottom edge of the rudder, by the way, serves as a tail skid. It's protected against wear by a short length of wire.

Bill of Materials

(Complete plans will be found on the following pages)

All wood, unless otherwise specified, is balsa

Fuselage: Ten pieces $\frac{1}{4}$ " by $\frac{1}{4}$ " by 48" for fuselage longerons and cross-members;

Six pieces $\frac{1}{4}$ " by $\frac{1}{2}$ " by 48" for fuselage stringers;

One piece $\frac{1}{8}$ " by 2" by 18" for window fillets and formers;

One piece $\frac{1}{4}$ " by $3\frac{1}{2}$ " by 6" for plywood fire wall (spruce);

Two pieces $\frac{3}{8}$ " by $3\frac{1}{2}$ " by 6" for cowl blocks.

Wing: Three pieces $\frac{1}{4}$ " by $\frac{1}{4}$ " by 40" for leading edge;

Three pieces $\frac{1}{4}$ " by $1\frac{1}{4}$ " by 40" for main spar;

Three pieces $\frac{1}{4}$ " by $\frac{1}{2}$ " by 40" for rear spar;

Three pieces $\frac{1}{8}$ " by 1" by 40" for trailing edge;

Three pieces $\frac{1}{8}$ " by $\frac{1}{4}$ " by 40" for auxiliary spar;

Twenty-four pieces $1/16$ " by $1\frac{3}{4}$ " by 12" for ribs;

Twenty-four pieces $\frac{1}{4}$ " by $1/32$ " by 10" for capstrips;

Five pieces $1/32$ " by 2" by 40" for sheet covering.

Stabilizer: Two pieces $3/16$ " by $3/16$ " by 15" for leading edge;

One piece $\frac{1}{8}$ " by 2" by 18" for sheet outline;

Four pieces $\frac{1}{8}$ " by $\frac{1}{2}$ " by 36" for ribs and spars.

Rudder: One piece $3/16$ " by $3/16$ " by 12" for leading edge;

One piece $\frac{1}{8}$ " by 2" by 8" for sheet outline;

One piece $\frac{1}{8}$ " by $\frac{1}{2}$ " by 36" for spars and ribs.

Miscellaneous: Six feet $\frac{1}{8}$ " steel wire for landing gear;

Twelve inches celluloid $\frac{1}{2}$ " wide for windows;

Two $4\frac{1}{2}$ " airwheels;

Copper wire for hinges;

Twenty-four inches dural angle $\frac{1}{2}$ " by $\frac{1}{2}$ " for motor mounts;

Music wire; rivets, covering material, dope, cement, etc.

formers. The stringers should be brought to the rear of the fuselage to form a "cluster" shaped according to the contour of the tail post.

The window fillets are cut from $\frac{1}{8}$ " sheet balsa and glued in place. It is not advisable to glue the celluloid windows on until the ship has been covered and painted.

LANDING GEAR AND MOTOR MOUNT

THE landing gear, of $\frac{1}{8}$ " steel wire, is made in two halves and soldered together at the junction of the axle. Run the wires across the inside of the fuselage, and cement and tie them in place with thread.

The motor mounts are $\frac{1}{2}$ " by $\frac{1}{2}$ " dural angle, cut to size as shown on Plate 1 and riveted together. Two mounts are needed—one right and one left. Engine mounting holes should be drilled according to the engine you plan to use. The mounts are secured to the fire wall by four bolts.

Make cowl blocks from $\frac{3}{8}$ " sheet and cement against the firewall. Leave the top open for motor cooling and adjustment, of course, although the bottom may be closed in if desired.

In making the wings, the spars are the first interest. Use $\frac{1}{4}$ " by $1\frac{1}{4}$ " stock for main spars, and $\frac{1}{4}$ " by $\frac{1}{2}$ " for rear spars. Splice them as shown in the isometric drawing on Plate 2. Cover the sides of the splice with $1/16$ " sheet for added strength.

Cut twenty-four ribs from $1/16$ " sheet. Lay the spliced wing spar on the plans and glue in the ribs on one-half of the wing. Then place the other half of the spar on the paper and put in the remaining ribs. Insert the trailing edge in the slots provided, and glue in place.

The leading edge is also installed in a similar manner. Cut the wingtip pieces from $\frac{1}{8}$ " sheet, glue them together, and attach them to the wing.

With $1/32$ " sheet, cover the center section on both sides and tips and leading edge on the upper side. Glue capstrips $\frac{1}{4}$ " by $1/32$ " over the tops of the ribs. Sand all the sheet balsa to make a good base for smooth covering.

TAIL CONSTRUCTION

LEADING edges of the tail surfaces are $3/16$ " by $3/16$ ". The trailing edges and tips are cut from $\frac{1}{8}$ " sheet. The spars are $\frac{1}{8}$ " by $\frac{1}{2}$ ".

First pin down the leading and trailing edges, using spacer blocks underneath them to help procure the proper contour. These blocks should be $5/32$ " for

the leading edge and $3/16$ " for the trailing edge. They enable you to finish the tail ribs to a close and more accurate streamlined section without plotting the ribs individually. When the leading and trailing edges are in place, glue in the spars.

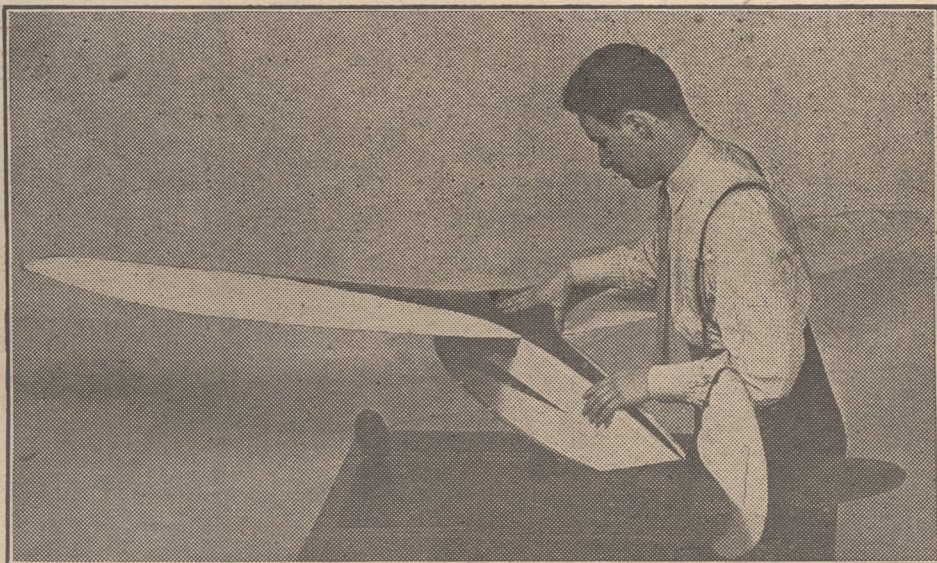
The ribs are $\frac{1}{8}$ " by $\frac{1}{2}$ " rectangular pieces cut to the sizes shown on the plans and cemented in place. They are sanded to a streamlined section after the framework is assembled. The lower part of the rudder should be covered with soft steel wire to act as a tail skid. The rudder flap hinges are of soft copper wire pushed into the wood, bent, and glued in place.

Install the motor ignition system and make a battery box according to the drawing. The battery contacts are cut from thin sheet brass. A spring to hold the batteries tight against the contacts can be made from music wire wound in spring fashion and soldered to the battery connection. Cement the battery box between formers Nos. 1 and 2. The wire spring should be in front of the box so as to absorb the momentum of the battery in the event of a crackup.

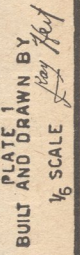
The covering may be either silk or bamboo paper. The designer's *Scram II* is covered with bamboo paper. Before applying, remove all dried cement that might spoil the covering job. Use glue to secure the covering in place.

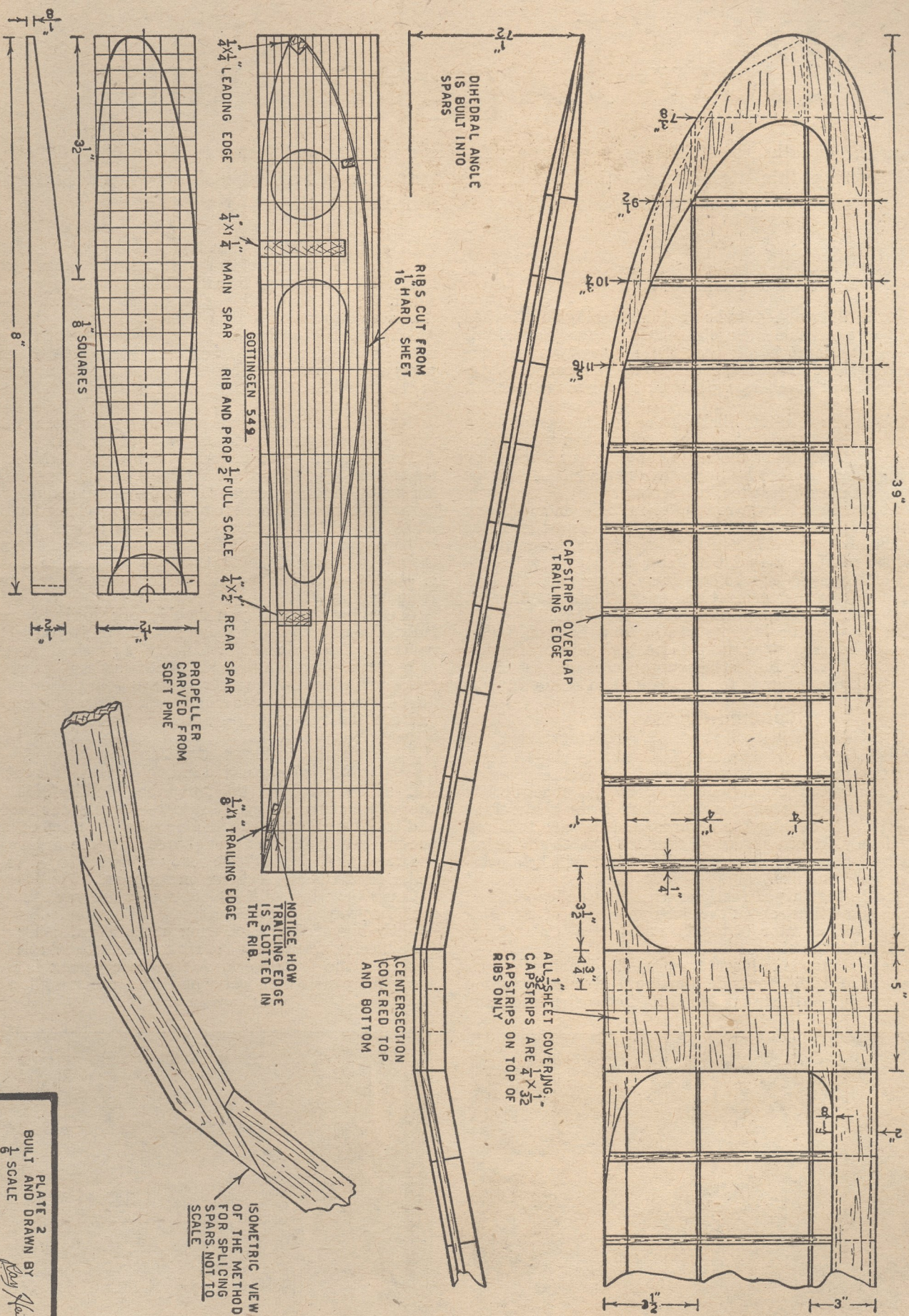
Dope all surfaces with three coats of clear and two of colored dope. Choose colors that are most effective at a distance—red, yellow, orange, or blue. The original ship is red and cream.

(Continued on page 79)



Fellows, here's Designer Ray Heit himself, giving "Scram" a prideful once-over. Ray, you know, has been in the modeling game about ten years—he started almost on the same line with FLYING ACES! He's attended the Nationals twice and expects to fly "Scram" there this year. He boasts a whole roomful (almost) of medals, trophies, certificates, and other prizes that he has won.





"Bow-Legged Sailor"

"You're a sweetheart—if there ever was one!" Aye, aye, me hearties! Seems as if that lilting li'l chanty just describes this latest Garami stick model. So we'll stow the gab and pipe all hands on deck. Lay out your balsa, lads, and "fall to." Yo! Ho! And a bottle of—banana oil!

By Louis Garami

MAYBE we seem to be stretching things a bit when we call this stick job the *Bow-Legged Sailor*. But you must admit that those Navy-type trouser-legs that serve as landing struts *do* look sort of seagoing-ish. So, balsa butchers, we'll stick to our name whether you like it or not.

And anyway, didn't Shakespeare or Chaucer or Ring Lardner—or some similar classicician—ask "What's in a name?" And didn't the same chap answer himself by saying that "A rose by any other name smells just as sweet"? Or am I just too, too, wrong?

But of course if the word *Sailor* isn't far enough along in the dictionary to suit you, turn to the next letter of the alphabet and call the ship *Tamale*. For this model is a peppy performer that will bring tears of envy to the eyes of any modeler who sees it fly. Your pals will look at the ship in wonderment and each will say to himself, "Gosh! Why won't *my* stick job fly like that?"

Stability is the keynote of the *Bow-Legged Sailor*. This, of course, is because of the high wing. The profile body is used for better appearance, and the sheet balsa tail was designed for simplicity and strength.

BUILDING THE "SAILOR"

SO NOW let's clean last month's shavings from our benches and start work. Look at the plans on the next two pages so that you know what you're going to do. Then trace the body outline onto a 1/8" sheet of soft balsa. Cut out the piece with a sharp razor blade. Take your time in cutting the corners, and be sure that you cut cleanly. If you *should* go over the line at any point, however, a drop of cement applied there will help overcome your mistake.

Smooth the shaped fuselage with fine sandpaper. And at the same time, check the flat upper edge of the stick (where the elevator is to fit) to be sure it's at right angles with the sides.

The next step is to insert the propeller bearing. We use a length of 1/16" (outside diameter) aluminum tubing for this, and have always found it simple, foolproof, and

satisfactory. Since a smoothly revving prop is highly necessary, however, we'd suggest that if you have found a better type of prop bearing, that should be used, instead. Try out several types, and finally stick to the one that seems to serve you the best.

After installing the bearing, coat the nose of the ship with cement for added strength. Then shape the wire parts as shown on the plans. If you cannot dig up a piece of the very fine .01 wire specified for the tail skid, use a sliver of bamboo.

Cement the landing gear and rear hook several times, until a skin is formed at each point of contact.

The wooden parts of the landing gear—the sailor pants—are glued direct to the wire. Do not cement the horizontal landing gear strut to the body, because free movement is needed here to absorb the shocks of landing. Make the wheels from sheet balsa—a pair of dividers will be found of value both for measuring and cutting them—and after slipping them onto the axles a drop of cement applied at the ends of the wire will keep them from coming off.

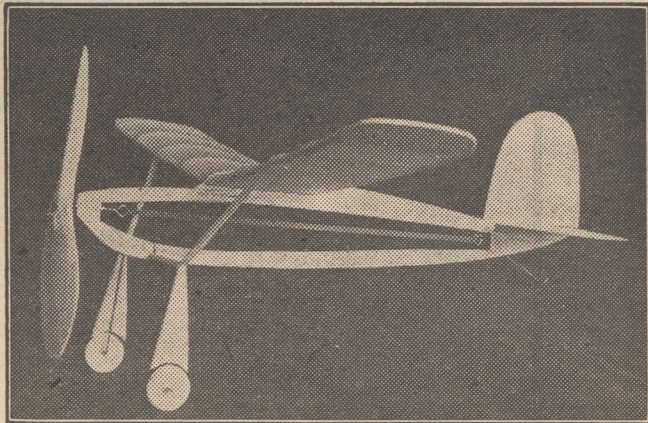
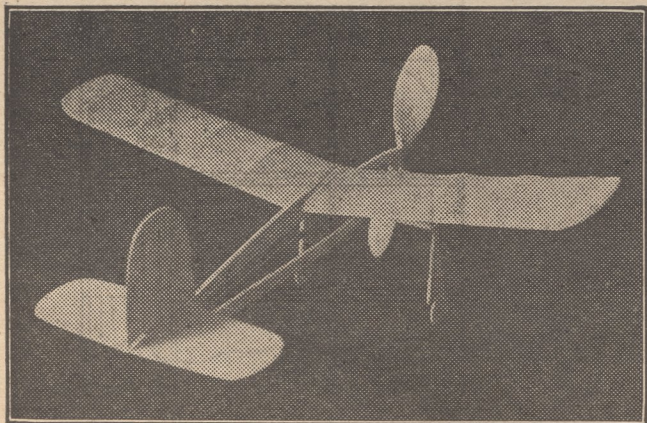
In carving the prop, you should work slowly and carefully. Use an extremely sharp knife. And if you're in a particular hurry or don't classify yourself as a good prop-shaper-upper, a "rough" ready-made 6" balsa air-screw will only cost you a few cents at your dealer's shop. Just shape out the blades and smooth off the rough spots, and add the eyelet bushings and washers.

WINGS AND TAIL

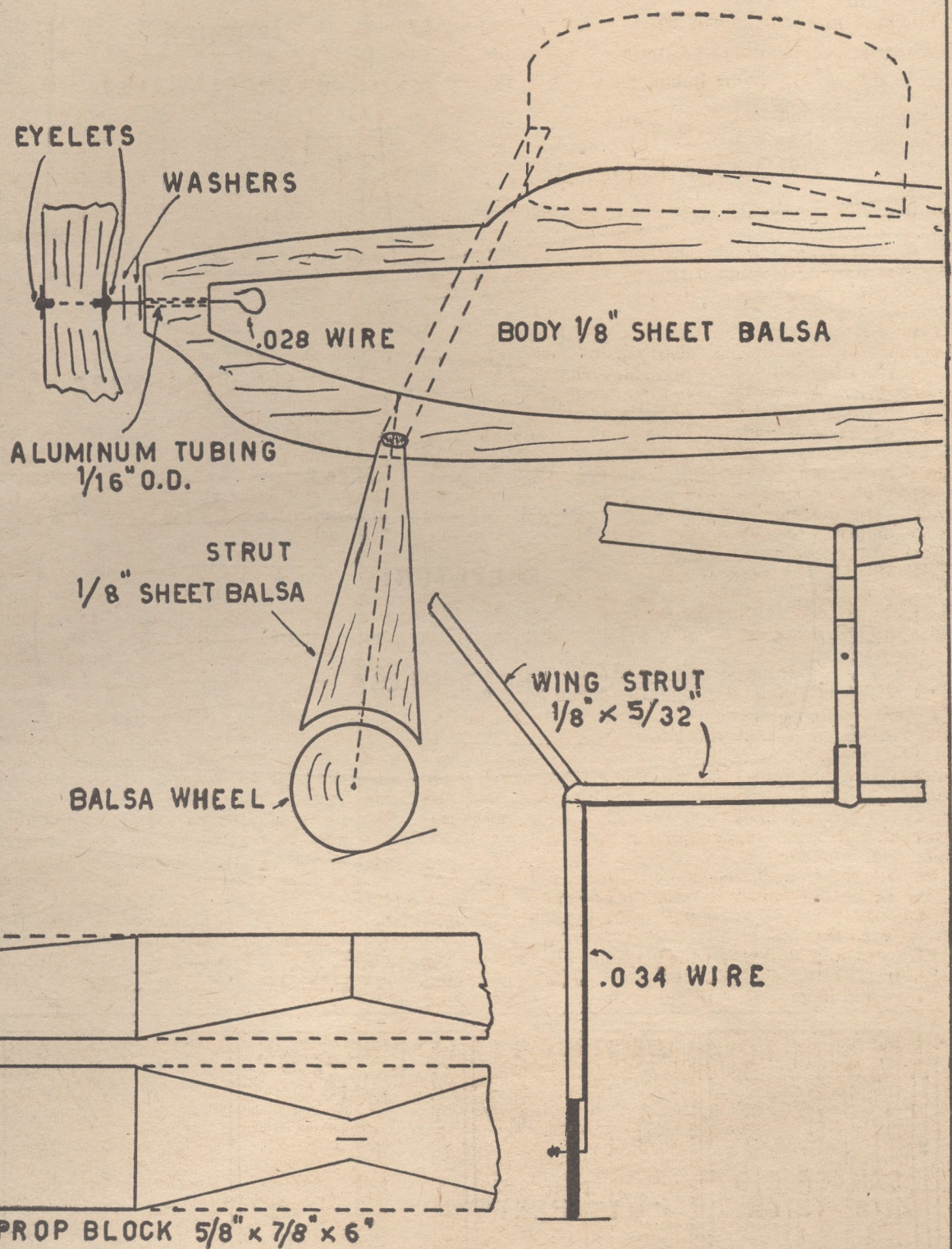
THE wing is constructed in two halves. First cut out all the ribs, pin them together side by side, and sandpaper them. No spar is used—just lay the leading and trailing edges down and glue the ribs on top of them one-and-a-half inches apart. While they are drying cut the balsa tips, so they'll be ready to be cemented to the last ribs at the angle shown on the plan.

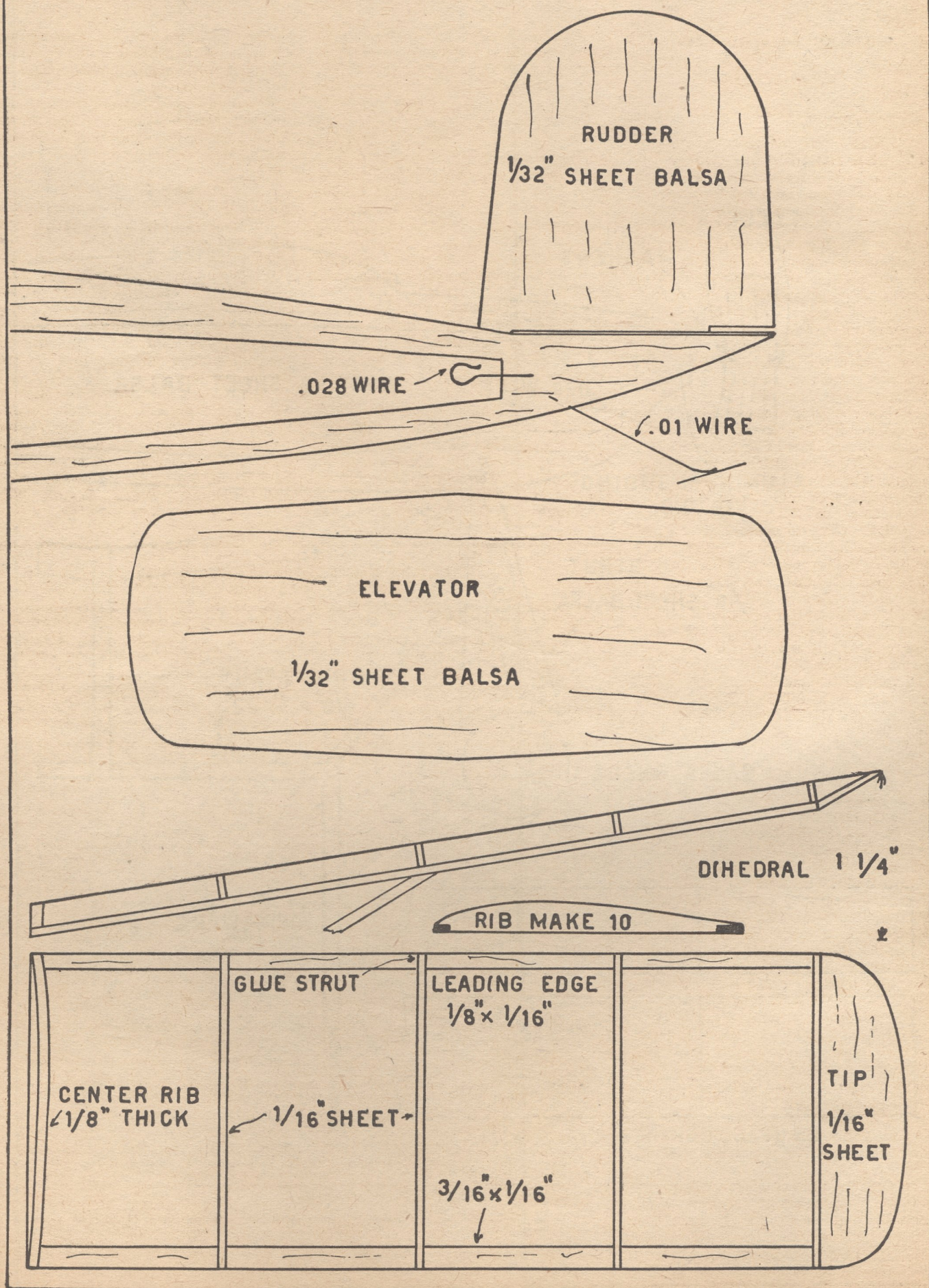
Cover the wing with jap tissue—or are you a boycotter? Anyway, cut four pieces of *some* kind of tissue slightly bigger than each wing panel. Then, using dope for adhesive, work from one rib to the next and stick the paper on the framework. After the covering is done, spray the panels with water on both sides and allow the

(Continued on page 66)



Left: Of simple but sturdy construction, this "Bow-Legged Sailor" is a stick-type job offering plenty of peppy performance. The ship is good for both indoor and outdoor flying. Right: Those navy-style pants on the landing struts are to blame for the aquagraphic cognomen (Boy! There's a pair of words for you!) that Louis has applied to his model. The wing of the "Sailor," by the way, is a built-up affair, while the tail surfaces are of sheet balsa.





News of the Modelers

Latest Dope On Nationals

"SOLID" ENTRIES ENCOURAGED

IN THE Nationals this year at Detroit, extra stress is to be placed on the flying scale model event in order to stimulate interest in this most interesting branch of model airplane making. The big meet, as most modelers know by now, will be held July 6-9, although it is recommended that contestants and spectators reach Detroit on or before July 5 in order to register and "settle themselves" before the heavy excitement begins.

The new flying scale rules permit the alteration of blade, width, and pitch of the model prop from that of the original ship, but the prop's diameter must be the same. Wing area of flying scale models cannot exceed 200 square inches. The models must conform to the outdoor weight rule of 3 ounces to every 100 square inches of main wing area.

Judgment on flying scales will be passed according to neatness of general workmanship, amount of detail, originality in the reproduction of parts, and similarity of finish and color to the "big ship" after which the model is scaled. In the matter of strict scale details, length, depth and width of fuselage will be checked; chord, span, and airfoil of the wings will be measured, and the outline and dimensions of tail control surfaces will be a factor. Landing gear details and engine and prop will be rated. And, of course, the flight performance of the scale model will be an important consideration.

Exact scale outline plans from which the model was made must be submitted to the Contest Director, Hotel Fort Shelby, Detroit, Mich., no later than July 5. The scale used by the modeler must be indicated on the plans.

In the matter of prizes for the entire meet, there will be twenty-one (count 'em) Championship laurels to be worn home by careful modelers. And hundreds of lesser trophies, medals, plaques, magazine subscriptions, and similar recognitions are awaiting the remaining winners.

To the contestant who wins the highest total points and who places in most events, indoor, outdoor, and gas, will be given the title of National Model Airplane Champion. He will receive the Detroit Exchange Club's handsome 50" American Model Championship Trophy and a cash prize of \$200—and these items, say we, are worth working for!

Besides the contest proper, there'll be a grand assortment of fun and entertainment "on the side" in Detroit. The Detroit Exchange Club, sponsor of this year's meet, is determined to make the occasion a memorable one in the minds of all who attend. Banquets big-

ger and better even than any ever held before (remember last year's?—*Mmm!*), sightseeing tours, and additional features of the "kind you can't forget" are just a few of the special events.

And we're wondering if *The Daily Blurb* will pop out again. Last year, you'll remember, the "boys from Boston" presented this mimeographed sheet. One of its features was a modeler's dictionary. Most modelers can testify as to the accuracy of the definitions. Here are some:

ARMORY—A small shed equipped with the latest devices for snaring model planes.

MODEL EXPERT—One who can talk faster and sound more convincing than the other fellow.

SCIENTIFIC DESIGN—Fictitious name for an old crate that made a lucky flight.

If you're planning to participate in the Detroit tourney, *now*—not tomorrow or next week—is the time to send your request for full information to the National Aeronautic Association, Contest Committee, Dupont Circle, Washington, D. C. With your letter, en-

close either a five-cent stamp or a *large*, stamped, self-addressed return envelope. Complete rules and an application blank will be sent to you.

For your stay in Detroit, incidentally, special rates have been arranged at the Hotel Fort Shelby. This hotel, as before, will be Meet Headquarters.

QUAKER CITY OFFICERS

PICKED for their outstanding ability in various fields of gas model and associated activity, the directors of the Quaker City Gas Model Airplane Club, of Philadelphia, Pa., are right on their toes in the performance of their respective jobs. William S. Berry, Jr., a pioneer in the modeling game, is "the Director" of the Club. He is assisted by the following-named directors on the various committees:

Technical committee: Walter Eggert, Jr., Walter Eggert, Sr., Jack Conine, Charles Bossi, Charles H. Stagg, Walter Hurleman, and Norman Schaller. Publicity and membership committee: William Price, Benjamin Maecheck, Leonard Gutekunst, Walter Eggert, Wil-

(Continued on page 65)

CONTEST CALENDAR

Philadelphia, Pa.—Sunday, May 29: First annual gas model classic of the Philadelphia Gas Model Association. Timer flying. Plenty of prizes. Contact Jesse Bieberman, 3219 E. Brighton St., Philadelphia.

Boston, Mass.—Saturday, June 4: Northeastern States Model Meet at Boston Garden. Outdoor events next day at Harvard Practice Field. Open to all. Dope from Al Lewis, Junior aviation League, Jordan Marsh Store, Boston.

Gary, Ind.—Sunday, June 5: Northern Indiana Model Builders' Contest sponsored by Bram's Service Stores. Exhibition, rubber-power endurance, gas model consistency events. Open to out-of-town contestants. Rules from Bob Roberts, Bram's, 4490 Broadway, Gary.

Allentown, Pa.—Sunday, June 5: Annual Rubber-powered Championship Meet sponsored by Flying Keystone Model Airplane Club. Many prizes. Latest info from Flying Keystone, Allentown Y.M.C.A., Center Square.

Philadelphia, Pa.—Saturday, June 11: Quaker City Gas Model Airplane Club Championship Gas Model Meet at Northeast Airport, Red Lion Rd. Thirty-second engine run endurance event. Valuable prizes. Entry blanks, etc., from Charles Bossi, Germantown Unit, Mayfair House, Germantown, Phila.

Los Angeles, Calif.—Sunday, June 12: Gas Model Airplane Association of Southern California contest. Write Grant Carder, 1640 W. 60th St., Los Angeles, for latest dope.

Rochester, N. Y.—Third Annual Outdoor Contest of the National Aero Reserve, sponsored by Rochester Times-Union. Many events—first prize in each is gas engine. Late June. For exact date and other info, write Contest Director, N.A.R., c/o Times-Union.

Bloomington, Ill.—Sunday, June 19: Gas Model Meet of the Bloomington-Normal Chapter, N.A.A. Plenty of prizes. Contact R. G. Blakney, 814 E. Locust St., Bloomington, for details.

Linden, N.J.—Saturday, June 25: New Jersey State Gas Model Meet—State Championship and "out-of-towner" events. Full dope from Roy Messinger, Linden Model Aircraft Club, Old City Hall, Linden.

Marshalltown, Iowa.—Monday, July 4 (tentative): Annual Contest of Ace Model Club. Complete dope from the Club, 19 South Center St., Marshalltown.

Detroit, Mich.—July 6-9: The Nationals! See elsewhere in this issue and also last month's article, "On To Detroit!" for information. Entry blanks from National Aeronautic Association, Dupont Circle, Washington, D. C.

Scranton, Pa.—Sunday, July 17: Anthracite Gas Model Airplane Club announces its second Annual Contest. Out-state contestants welcome. Prizes many and varied. Full facts from Carmin Castellano, Contest Chairman, 1010 Jackson St., Scranton.

Chicago, Ill.—Sunday, August 7: Midwestern States Gas Model Contest at Gage Park, 2411 West 55th St., Chicago. Chicago Gas Model Aeronauts, sponsors. Open to all. Write R. L. Webber, Contest Director, 217 N. Desplaines St., Chicago.

Allentown, Pa.—Sunday, August 7: Annual Gas Model Championship Meet sponsored by Flying Keystone Model Airplane Club. Plenty of prizes. Contact Flying Keystone, Allentown Y.M.C.A., Center Square.

St. Louis, Mo.—August 13 and 14: Sixth Mississippi Valley Championship Meet. Full particulars from Stix, Baer, and Fuller, sponsors.

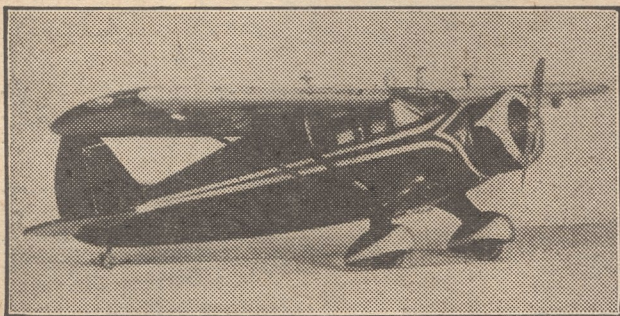
Staten Island, N. Y.—Sunday, August 14 (tentative): Annual Gas Model Contest, Richmond Model Flying Club, at Miller Field, S. I. Info from the Club, 26 Bond St., Port Richmond, S. I., N. Y.

Trenton, N. J.—Sunday, August 21: Second Annual Trenton Eastern States Gas Model Meet at Mercer Airport. Cash awards, permanent trophies. Information from Trenton Aero Society, 212 Centre St., Trenton.

Lebanon, Pa.—Saturday, August 27: Fifth Annual Outdoor Flying Contest. Gas and rubber models. Details from Contest Director, Lebanon Exchange Club, sponsor of the meet.

Akron, Ohio.—August 30-September 2: Scripps-Howard Junior Aviator 1938 National Model Air Races. For full dope, see your local Junior Aviator column or contact Ed Clarke, National J.A. Editor, Cleveland Press, Cleveland, Ohio.

All clubs and organizations sponsoring model airplane meets are urged to send us advance notification of contests for inclusion in this calendar. Such notices should be in our hands at least six weeks in advance. Results of meets, and pictures when possible, are likewise desired for inclusion in our model news columns. Address Contest Calendar, FLYING ACES, 67 West 44 Street, New York City.



Solid Jobs From

Flying Model Plans

ANXIOUS to build a display model of some particular ship, "solid" fans are sometimes disappointed in finding only flying model plans for the desired craft. The need for solid plans, however, should never be regarded as a stumbling block, for with a minimum amount of effort and a knowledge of how to go about it, flying plans can easily be converted into satisfactory working designs for a balsa block model.

The essential requirements for such conversion are merely that the modeler have an amateur's knowledge of the use of drawing instruments and has already learned the rudiments of model making. If he hasn't been using drafting materials recently, a re-reading of the author's article, "How to Make Models from Three-Views," in FLYING ACES for September 1937, would be of value.

And now we'll assume, for instance, that we've found flying model plans for a job we've been waiting for. But—we want to make a *solid* model of the ship. The span of the flying job is, say, 24". For our display shelf we'll have to use a 12" replica, one-half the size of the plans we have before us. So we must bear in mind that all dimensions on the original plan must be cut one-half.

"BLOCKING OUT"

FIRST tacking a sheet of drawing paper to the board, we rule out a box of the correct size. The wingspread, as we have said, is 24". The chord, say, is $4\frac{1}{2}$ ". Thus our box should measure 12" by $2\frac{1}{4}$ ". A triangle and T-square should be used to insure accurate angles. Mark the center of the box by ruling a faint line down through the middle.

Now, on the flying model plan, measure outward from the center of the wing to the point at which the leading edge curves backward to form the wing tip. This, say, is ten inches. Half of ten is five, so mark off two points on the ruled box, each five inches out from the center line. These points, of course, show where the "solid" wing will start its curves.

To determine the amount of taper on the trailing edge, it is necessary to box in the full-size flying model plan with a full-size box, 24" by $4\frac{1}{2}$ ", as shown in Fig. 1 on the opposite page. When this has been done, use a ruler and extend the trailing edge out beyond the side of the box, as indicated in dotted lines at the right side

By Nick Limber

of the flying model wing. Note that the extended trailing edge line and the side of the box intersect at a point $2\frac{1}{2}$ " up from the bottom line of the said box.

One-half of $2\frac{1}{2}$ " is $1\frac{1}{4}$ ", so on the outside lines of the "solid" wing box, place a dot $1\frac{1}{4}$ " up from the bottom. Thus the taper-line of the trailing edge will run from the exact center of the bottom line and out through the marked points. See the scale model wing on Fig. 1.

The most ticklish part of the job is to duplicate the curve of the wing tip. This *might* be done freehand, but it is much better to experiment with standard French curves or a curved ruler.

Wing flaps and ailerons, and the like, should be indicated on the scale model drawings. These are proportionately reduced from the measurements on the flying model wing. For instance, we'll assume that the ailerons on the flying model start eight inches from the center of the wing and extend to the tips, are 1" wide, and run entirely parallel with the trailing edge.

To indicate these on the scale model wing, we make them $\frac{1}{2}$ " wide and start them four inches out from the center line.

Cross sections of the wing are determined in a manner similar to that used in shaping up the wing outline, except that instead of working from the wing, the wing ribs are blocked out and reduced.

DEVELOPING THE FUSELAGE

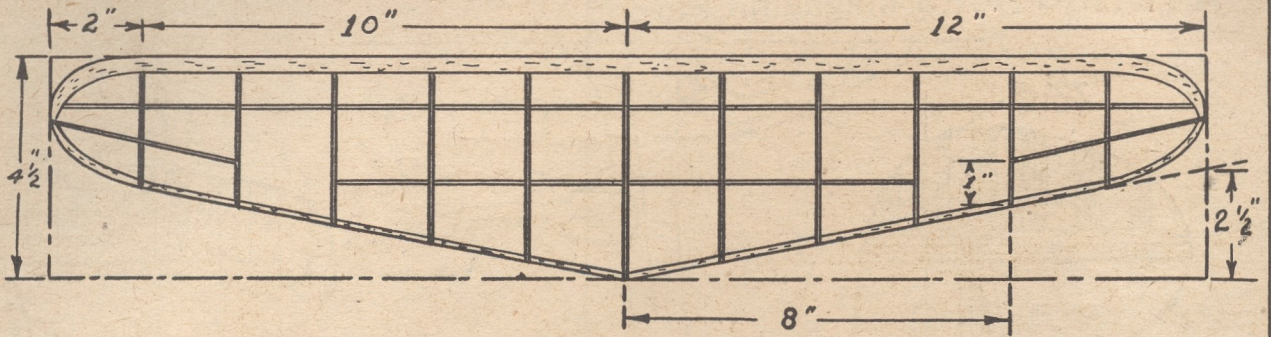
SOMEWHAT the same system is used in making solid plans for the fuselage. Here, though, three plans must be blocked out—one each for the top view, the side, and the front. Referring to Fig. 2 on the accompanying plate, it will be seen that points along the sides of the block are marked off to assist in shaping the fuselage.

All three fuselage plans are handled in the same way, the cross-sections being developed from the flying model fuselage former or bulkhead outlines.

Follow the same idea with the tail surfaces. Bear in mind, however, that the rudder and stabilizer of a flying scale model will usually be somewhat enlarged for better flight performance. Such plans frequently have the scale outline indicated with broken lines. These are the lines from which to plot your solid scale plans.

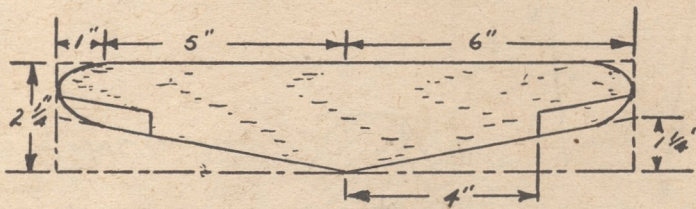
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HERE'S A DECIDEDLY PRACTICAL DRAFTING FEATURE



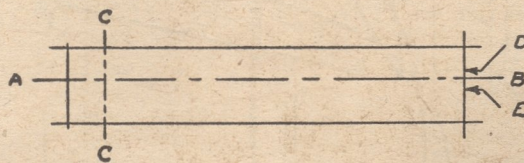
Flying Model Wing

FIG. 1.



Scale Model Wing

FIG. 2.

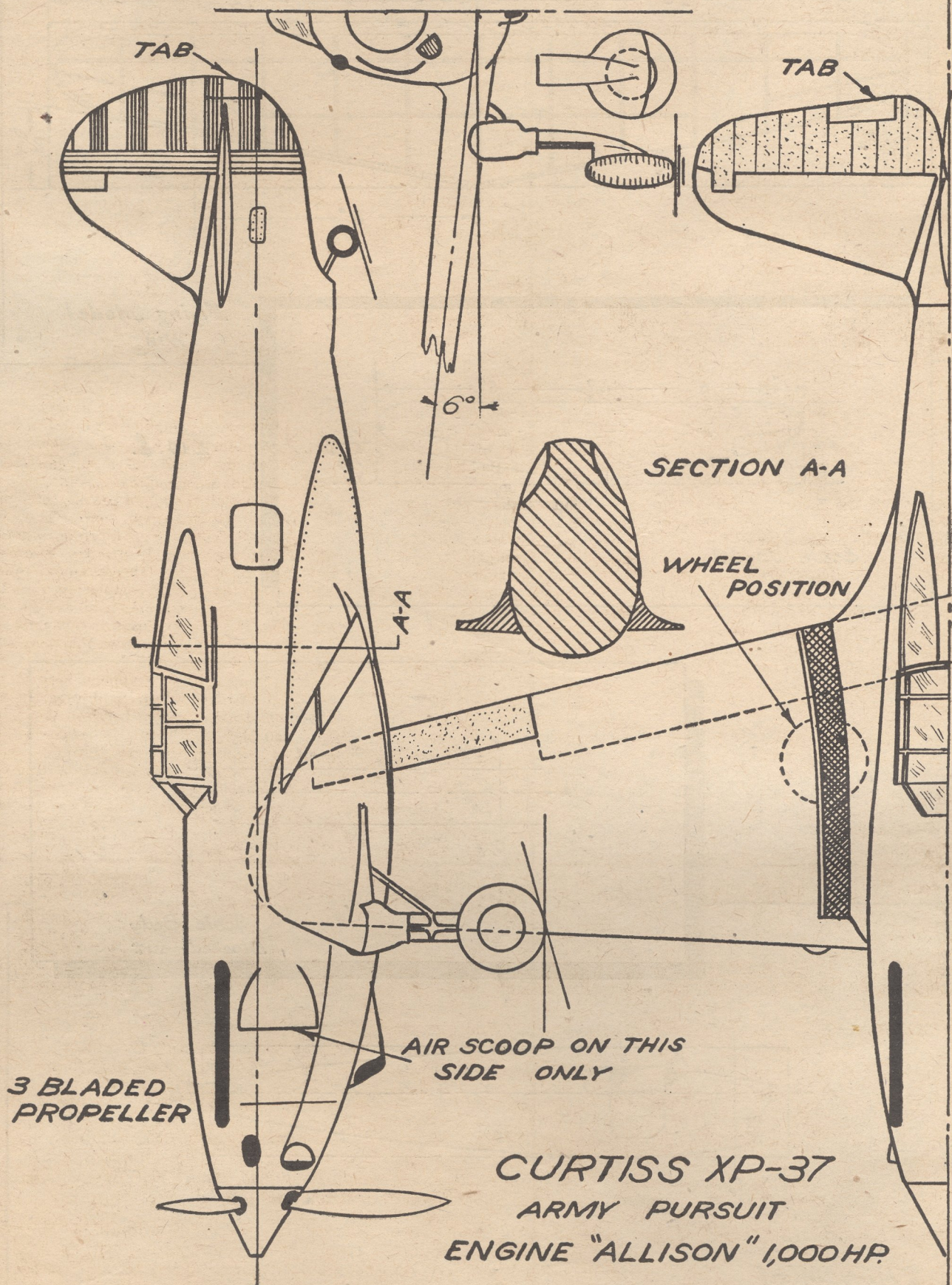


Scale Body Blocked-out



Flying Model fuselage

A FLYING ACES Magazine Plan



SCALE $\frac{1}{4}" = 1'0"$

Neil J. Cummings 38

The Market Log

Douglas Model Aircraft Co. is releasing its latest "brainchild"—a gas model known as the *Douglas E-Gull*.

The new job includes many of the latest developments of model aircraft engineering. It has a wing span of 69", weighs 2½ pounds, and may be purchased in kit form at \$8.50. The kit includes wing and body formers all shaped and notched. Rudder, wing tips, and elevator tips all cut to shape are an additional feature that simplifies construction.

A special cowl and a pen-type battery holder are included in the kit. Full sized drawings, M and M wheels, and all color materials are supplied.

The regular kit contains silk covering. Builders who wish to save a buck, however, may pay \$7.50 and get the same kit but with bamboo paper instead of the silk.

Miniature Aircraft Corp. This company has now placed on the line a gas model kit for the Fairchild 24. Offered at \$10.95, the kit includes a complete supply of material for the model.

When completed, the job has a 69" wingspan and weighs about 3¾ pounds complete with the motor. Wheel pants and ribs are cut out, while the fuselage formers are printed on balsa.

Model Plastic Mfg. Co. Again the nautical minded airplane builder is being considered by model manufacturers, for this company is offering a new line of extremely light moulded pontoons. The pontoons are designed mainly for performance—but appearance has not been overlooked. In size and weight, they range from 10" and 1/6 oz. to 16" and 3/5 oz.

In price, they run from \$1.10 to \$1.95 per pair. A descriptive bulletin is available.

Charlotte Model Aircraft Co. A 5½' spanned *Burrow's Special* is this company's latest introduction into the gas

model field. The model is designed for consistent flying and top notch performance. Retailing at \$7.50, the kit includes timer and air wheels. Minus these two items the kit may be bought for \$5.50.

Full-sized plans and all necessary materials are included in the kit.

Herkimer Tool and Model Works. A new motor, radically different and with a new type of cylinder, is now offered to modelers by this company. The new engine is said to eliminate cylinder distortion and to insure easy starting.

Known as the *O.K.* the plant retails
(Continued on page 65)

What Do You Say?

JACK GETS HIS BADGE

Editor, *FLYING ACES*:

Say! I just read "What Do You Say?" in the April mag. One guy said his ship made 40.5 m.p.h. Well, that's all right! But that's only *speed*—and what's speed compared to *brains*?

Here's what *my* ship did: I built a *Flying Aces Parlor Fly* and went to a Boy Scout Court of Honor to pass my Aviation Merit Badge test. Darned if the *Fly* didn't go way out over everyone's heads, make a beauty of a turn—and then come back to call the attention of the judges to its swell flight by socking one of them right square in the face! Was I embarrassed!

You see, they asked me to fly the ship in the courtroom to prove it would actually fly 25 yards. And since the ship's an indoor model and I'd already had over 25 successful flights with it, I sent it up for them.

Guess the *Fly* didn't care so much for that particular judge. But—I passed all the requirements and got my badge. And now I'm working on my first gas model. Anybody got any hints for me on a good two-color decorating scheme?

JACK MARKLE,
LaConner, Wash.

Workbench Tips

R. O. G. PROPELLER

IF you are having trouble carving light props from balsa blocks, you might be interested in this kink. Take a piece of 1/32" flat balsa and cut out a propeller, shaping the blades the way you prefer. Then give pitch by twisting over the spout of a steaming kettle and quickly coating with a thick covering of glue at the hub and about one inch up along each blade.

When the glue dries, the pitch is in to stay for several months. The blades may be sanded even thinner, if desired. At the hub, the propeller is thick enough for a wire to be shoved through and bent around one side to grip it. Eventually, of course, the propeller loses its pitch as the glue cracks. But for an inexpensive, quickly made prop, whose main asset is lightness, this method is workable and easy.

R. E. FOSTER.

ON APPLYING CEMENT

IF there is one chief essential in model airplane building—and particularly in the gas model end of the game—that essential is strength of joints.

It is well known, of course, that joints should be cemented twice. This isn't enough, though. For in ordinary double-cementing, the joints are *weakened*. This is because the anxious builder, interested only in completing his job as quickly as possible, applies the first coat of cement, allows it to partly dry, and then slaps his second coat on within an hour or so.

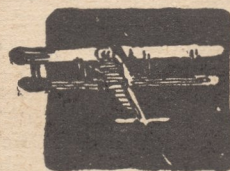
What actually happens here is that the second application dilutes the first and draws it from between the joints, and the final result is weakened construction all the way through.

To be sure of tight joints, allow all cementing to dry *at least overnight* and even longer than this when possible.

—TED BURZYNSKI

Here's the "Flight Plan"
for the

NEXT SMASHING NUMBER OF FLYING ACES



FACT—"Spain Has Witnessed a Modern Air War!" A revealing article in which Major Fred Lord—who battled there—refutes the recent statements of Major-General James E. Fechet. And Lesson No. 3 of our exciting story-form flying course, "Learn to Fly With Jack Conroy!"

FICTION—Dick Knight in an action-packed sky-fighting yarn involving the huge new trans-ocean Boeing.

Phineas and the "bombs of brotherly love"—Joe Archibald's latest rib-cracking mirth-quake.

Plus a stirring North West Frontier air mystery which brings back hard-boiled "Crash" Carringer and his hurtling "Hale Hellion."

MODEL BUILDING—Plans for Germany's super-speed Messerschmitt Bf-109 pursuit.

"Toughie"—Al Orthof's cloud-climbing 5-ft. span gas job.

The Handley-Page bomber—another Henry Struck "Trail Blazer."

And a hangar-full of other top-notch model features.

In August **FLYING ACES**

On Sale June 27th

Hell's Hangar

(Continued from page 4)

down between those dummy pilots."

Braced for a quick zoom, he inched the Northrop in beside the big airliner. In tense silence, Doyle and he peered across toward the pilot's compartment as the two planes swung together. The Dewoitine again was flying level. Knight twisted the light-control grip and pointed the starboard light into the cockpit. There was no sign of a living person—only the two staring wax dummies, in pilots' uniforms, tied upright in the seats.

Meanwhile the amplifier of the ultra high-frequency set had been silent. But suddenly the music of the chimes again sounded, this time with greatly increased volume.

"I've got it!" yelled Doyle. "The transmitter's on board th' Dewoitine! Turn your light back in the cabin and—Holy smoke, look at the ship!"

The airliner was yawing violently from right to left. Knight zoomed a hundred feet above it, then for the first time he realized that searchlights were probing the fog. Bright spots showed in half a dozen places where the mists blocked the powerful beams from the ground. The Dewoitine nosed down sharply, leveled out again, and in the same moment something plunged past one of the shifting circles of light.

Knight banked swiftly, and his recessed wing-lights flooded a sleek black ship. The plane whipped out of the glare, but as it did it turned broadside and in amazement Knight saw the swastika emblem of Germany on the tail. It was a Messerschmitt fighter—the famous Bf-109, cream of the Nazi air service, with a reported speed between 335 and 370 miles per hour. But what in Heaven's name was a German fighter doing over the heart of Paris?

The answer to that came with the speed of lightning. With a furious turn, the Messerschmitt plunged back at the Northrop, and from hidden guns in the cowl two streaks flamed at the circling spy-ship. Knight flung the two-seater into a tight split, almost crashing the Dewoitine. The German pilot dived under the airliner, reversed hastily.

"Kick her around, Dick!" Doyle belated. "I'll blast that devil!"

"Hold it!" Knight said tautly. "We're likely to start a war!"

He hurled the Northrop into a chandelle, bent on escaping from the German. But almost instantly two more Messerschmitts charged out of the murk, guns blazing. Knight's jaw hardened, and his fingers shot up to the buttons on the stick.

"You asked for it!" he muttered, and clamped the second button. Sliding flaps whirled open in the cowl, and with a roar two high-speed Browning 30's went into action. Tracers flung two yellow tracks across the gap and into the metal side of the leading Nazi fighter. The pilot kicked aside, then his gun fire ripped dural from the left wingtip of the Northrop. Doyle's twin-fifties now clanged up into position from their se-

cret niche in the turtleback, and the two-seater vibrated with their thunderous chant.

The searchlights had gone mad, were dancing wildly in all directions in a vain effort to break through and find the battling ships. Knight saw a swastika-marked wing flit through a blurred glow at one side. He whipped around, crashed out a burst. The radio stub-mast aft of the German's cockpit crumpled under his bullets, and the antenna flipped back over the tail.

For a second, Knight thought the ship would go out of control, but with a frantic jerk the pilot shook off the broken mast and came back. Crimson eyes winked from his wing-roots, as two more guns joined in with the ones on the cowl. The sudden blast ripped half the Plexiglass from above Knight's head and spattered bits of dural into his pit.

He snapped the Northrop down and around in a screeching renversement. Behind him, Doyle pounded out a barrage that drove the nearest pursuer into a frenzied climb. Knight slid his hand up to the master-button at the top of the stick. He had been saving the 50-caliber guns hidden in his wings, but the time for waiting was past. Whatever the reason, those Germans were out to annihilate them at any cost.

Above the thunder of the Wasp came the sharp clatter of Doyle's guns, fired broadside. Knight jerked his head. One of the Messerschmitts had zoomed high above, was diving headlong from the right. Knight whirled the two-seater, thumb hard on the master-button. All four guns burst forth with a grinding roar, and a gaping hole appeared just aft of the fighter's cockpit. As the pilot whirled, horrified, the shattered fuselage broke in two and the forward section went hurtling down into the mists.

KNIGHT zoomed over the tail section as it started to fall. The Dewoitine airliner had vanished in the fog, but it reappeared on his left, just as the two remaining Nazis came in furiously for vengeance. A fusillade from the first Messerschmitt raked the Northrop's cowl. Knight ducked with a shout of warning to Doyle, and splintered bits of metal swirled rearward, banging over the riddled enclosure.

The second Nazi fighter charged around the Dewoitine to catch the Northrop in the clear. Doyle spun his twin-fifties and crashed out a long burst. Then just as he fired, Knight ruddered away to avoid collision with the first Messerschmitt, thus causing the last tracers from Doyle's guns to rake the Dewoitine's cabin.

A blinding flame shot from the windows of the airliner, and it disintegrated with a terrific roar that shook the sky. Hurling back against his head-rest, Knight dazedly clawed at the stick. And the Northrop was on its back, starting to spin, before he recovered control.

He quickly rolled rightside up, stared

around in stupefaction. Greenish smoke was spreading in every direction, and below was a hole literally blasted in the fog. He could see the Seine and two of its bridges, and almost directly below was the Quai d'Orsay and a row of Government buildings. A searchlight spotted the Northrop before he could see anything else, so he hurriedly kicked away.

He was climbing blindly when Doyle gave a frantic shout. A gigantic structure loomed straight before him, and just in time he whirled the Northrop aside. By the glare of the searchlight he saw a platform with a railing, and suddenly recognized that colossal framework.

It was the Eiffel Tower!

A small but powerful light flicked out from the top platform, and he could dimly see two or three men. Tracers smoked past the right wing as he turned. He thought for a second they came from the tower, then he saw another black Messerschmitt darting in, with the two other fighters behind it. The new leader's ship overshot, and as it whipped into a vertical bank Knight glimpsed a gaunt face, with glaring eyes covered by huge goggles. The enclosure of the Messerschmitt was open, and he saw the pilot make a savage gesture toward the other Germans.

Knight jerked his throttle, and the leader overshot. With a swift touch at the rudder, he swung the Northrop toward the Nazi fighter. The wing-root fifties crashed out a lethal blast, but before he could center his tracers on the now zooming ship the other Messerschmitt darted in frantically. He hurled the Northrop into a tight chandelle, booting the tail around so that Doyle was in line with the nearest Messerschmitt.

In the same moment, his sights caught the leader's left wing. He thumbed the third stick-button, and the 30's hammered a burst into the aileron of the Nazi ship. Doyle's guns roared simultaneously, and a spout of flame lit up the misty sky and the fading greenish smoke. As Knight followed the leader into a dive, he flicked a look sideways and saw one of the fighters tumbling down in flames. The other Messerschmitt was plunging in recklessly, guns blazing, tracers tangling with Doyle's as the husky ex-Leatherneck spun his twin-mount for a death-blow.

Suddenly a bright red rocket streaked between the Northrop and the ship before it. A single-seater with French co-cordes shot out of the fog and squarely into the glow from light on the Eiffel Tower. The light went out, but not before Knight recognized a Loire-Nieuport 46.

As the French ship whipped around, flame belched from both its 20 m.m. guns. Both Knight and the Nazi leader pulled up hastily, for the cannons were blasting in between them. The other Messerschmitt flung a wild burst at the

Loire, then whirled at a signal from the leader.

In another second both Messerschmitts were lost in the fog.

THE PILOT of the Loire now warily eased in parallel with the Northrop and turned on his landing-lights. The glare reflected from the mists partly illuminated both ships, and Knight saw the pilot nod vigorously and point downward. He signaled back in the affirmative and nosed the bullet-scarred Northrop into a parallel glide.

"See if you can pick up the Le Bourget radio-beacon," he said to Doyle through the interphone. "This chap may know what he's doing. But I'm not following anybody in a blind landing."

Doyle switched to the Le Bourget beacon wavelength, and as the signals came in Knight glanced at the compass. As he had surmised, the Frenchman was heading for the great air terminal.

The Yank agent made a quick check of air-speed and altitude, was about to pull up and work out his own descent problem when the fog thinned enough to give a vague picture of the ground.

Blurred lights sharpened, revealing main arteries leading into Paris, and ahead he glimpsed the boundary markers and beacons of Le Bourget. He was lowering the wheels when without the slightest warning the Loire pilot jerked his throttle and dropped behind them. Instinctively, Knight kicked away—and saved Doyle and himself from instant annihilation.

A shell from the Loire's right-wing cannon smoked within a foot of the cockpit, and as he opened the Wasp full-out a second shell barely missed the cowl. Doyle's bellow of rage was drowned in the roar of his fifties.

Knight gripped the retracting-gear valve and pulled the Northrop into a thundering Immelmann as the wheels folded into their niches.

The Loire flung to one side as he pitched around after it, and he lifted his fingers from the gun-buttons. Doyle's burst had gone into the Frenchman's engine, and the single-seater was twisting down with a dead stick.

"The louse!" howled Doyle. "I hope he cracks up and breaks his neck."

"If he does we'll be in a fine jam," retorted Knight. "There'll be no way to get at the truth, and the French will be taking care of our necks with a guillotine."

"Holy cow!" cried Doyle. "Then we'd better dig out of here and make for England."

"No, that would only make matters worse. And we'd probably be intercepted, anyway. The best thing to do is tell the French officials the truth before our friend there has a chance to talk."

Lowering the wheels again, Knight dived for the terminal, with a hasty survey preparatory to landing. The Loire was a mile behind, stretching its glide. But when the American swung in at three hundred feet, he swore to himself. A transport was taxiing out to take off, and a red light from the tower peremptorily signaled him to sheer away. He made a tight circle, intent on plung-

ing down the moment the airliner was off the ground. But suddenly the transport stopped. The men in the tower had seen the crippled Loire and were giving it the right-of-way.

Knight kicked into a forward slip, landed cross-wind on the runway which angled across the one with the airliner. But the Loire was already gliding in against the wind, and as he raced in toward the row of buildings he saw the fighter come to a quick stop and the pilot jump out, waving his arms excitedly.

A spotlight from the tower swung toward the Northrop, and a motor car darted out as Knight braked to a halt. He cut off the motor, slid back the enclosure, and jumped down. But before he could say a word he was seized by three airport police, and two others covered Doyle with their pistols.

A second auto now drew up, and the Loire pilot sprang from its running-board. His goggles had been pushed up, revealing protuberant blue eyes close-set beside a large aquiline nose. He threw a swift glance at Knight and Doyle, wheeled to the senior *agents de police*.

"Take them into one of the private offices before a crowd collects!"

"Oui, Major Foix," said the policeman. He scowled at the prisoners. "Get into the car, *espion pig*!"

The machine swiftly conveyed them past a staring crowd of air-travelers and airport attendants, to a side door from which Knight and Doyle were hustled into a deserted office. One of the police switched on a light, pulled down the shades. Knight's attempts at speech were brusquely silenced, and he motioned his infuriated partner to keep still.

In a minute, Major Foix entered, and Knight saw a furtive glance pass be-



tween him and the senior *agente de police*, a swarthy, heavy-set officer.

"Have you searched the prisoner, *Monsieur Mireau*?" demanded the major.

"Oui, *commandant*," said Mireau. "They were both armed. But we found no papers aside from their passports."

"None are needed," said Foix, with a malevolent grin at the two Americans. "I know all about them—they are spies for Germany."

One of the policemen looked uncertainly at Mireau. "Shouldn't we be reporting this to the Prefect, sergeant?"

"Non," Foix snapped before Mireau could reply. "It is a matter for Intelligence; and we can afford no publicity just now. Sergeant Mireau, arrange to have that special Dewoitine started—the one with the experimental radio in it. The prisoners will be transferred in it to a more private spot. Also, have

their plane refueled at once; I intend to turn it over to our engineers to examine those secret gun-mounts and bomb-racks."

MIREAU saluted and went out. Doyle looked desperately at Knight. "What'd he say?" he asked. "What're they going to do?"

Before Knight could answer, the door to an adjoining room quietly opened.

"Bon soir, *messieurs*," said a voice. "What seems to be the trouble here?"

Foix started perceptibly, then covered his alarm with an oily smile.

"Ah, *Capitaine Robard*! You are just in time. I have caught two spies!"

Knight looked quickly toward the man in the doorway. He was blond and quite tall for a Frenchman. His uniform fitted him smartly, and there was a languid grace about him as he stepped into the room.

"Spies, eh?" He gave Knight and Doyle a cold glance. "Well, we of Intelligence will make short work of them if you can prove your charges."

"I can explain this matter—and tell you something else of interest," Knight said quickly.

But Foix broke in with an oath. "*Nom de Dieu*! I suppose you can explain shooting me down—and dropping a bomb on Paris!"

"So it was *these* men who caused the explosion?" exclaimed Robard. "We heard a plane had exploded in mid-air."

"No, these swine tried to bomb the city," Foix said hurriedly. "The fuse must have been set wrong. The bomb exploded prematurely in the air. Then they attacked me—"

"Ask the observers on the Eiffel Tower," Knight interrupted as Foix paused for breath. "They saw the entire affair. There were four German Messerschmitt fighters and a Dewoitine 620—"

"He lies!" snarled Foix. "I insist on their removal to safe detention for questioning."

Robard slowly nodded, reached over and picked up the Colt .38 which had been taken from Knight. With a tight little smile he turned and pointed it at Foix.

"I am indebted to you, *Herr von Lehr*. This saves me much trouble."

The color went out of the major's face, and the policemen looked dumbfounded.

"But, *Capitaine Robard*," gasped one of the men. "I don't understand."

But Robard was still smiling.

"It is very simple," he said. "In the name of the Republic, I am arresting the man known as Major Foix for espionage and treason."

CHAPTER III

A SINGLE CHANCE!

"THE MAN'S insane!" Foix cried hoarsely. "I command you to arrest him." But without moving his pistol, Robard reached his other hand inside his uniform coat and withdrew a folded paper.

"I have a signed warrant, *Herr von Lehr*—made out three days ago when we finally traced the mysterious F-9

radio calls to the experimental radio you put in that Dewoitine."

"This is an outrage!" von Lehr said, white-lipped. "I am the victim of a conspiracy."

Robard smiled. "If the workings of French Intelligence are a conspiracy, you are undoubtedly right." He turned to a staring police corporal. "Manacle the prisoner and take him into the next room. The rest of you go with him and see that this wily *Allemander* does not use any tricks and escape."

Still protesting, von Lehr was led into the adjoining office, his wrists secured with the twisted chains which serve as the French version of handcuffs.

Robard turned back to Knight, who was standing at one side looking at his features keenly. "I see you recognize me, *monsieur*," he said to the American.

Knight matched the Frenchman's smile with one a trifle ironic. "I seem to recall your taking a couple of shots at me in Madrid not long ago."

Robard looked somewhat embarrassed.

"*Oui*, I mistook you and your comrade here for anti-French spies when you were trying to break up the Four Faces group. I hope you do not hold it against me?"

"Not as long as you didn't hit me," said Knight. "And I take it, then, you know who *we* are?"

"In a vague way," nodded Robard. "I was working with the Loyalists then, and my investigations indicated that you had been sent over by the American Government. Also I heard later of your affair with the Italians in the secret Mediterranean station—so it seems, at the least, that you are engaged in my profession, *n'est ce pas?*"

"*Oui*," said Knight. They had been talking in French, but now he switched to English and introduced Doyle. Without revealing more than was necessary, he explained their presence in Europe, then briefly described the strange events of the evening, beginning with the chimes-signal and ending with von Lehr's treacherous attack.

Robard's whimsical expression slowly faded into one of intense seriousness. "I do not like all this. We have not heard such a signal, so they must have built special sets which this *diable* von Lehr knew, from his radio work with us, that we could not hear. But the explosion of the Dewoitine—and the wax dummies—are you sure of that?"

"We're plenty sure," interjected Doyle. "That crate came close enough to shave me with a wingtip if I hadn't ducked."

Robard looked amazed, then he smiled lamely.

"I see you have the sense of humor, *Monsieur* Doyle. I wish I could retain mine—but too many grave things are happening. France is surrounded by enemies—German and Italian spies are everywhere—"

"This von Lehr," said Knight. "Can't you drag something out of him? He must be a key agent."

"He is *the* key agent," Robard said sternly. "I have suspected him for months, and finally I learned how he

had been planted in the French Army, nine years ago. We watched him to see how many other spies we could trap before actually arresting him. But he is clever. When he wishes to communicate, he takes to the air, usually at night, or in bad weather. Where he lands, what he does, no one can tell. Perhaps he goes into Germany, or lands at an isolated spot in France. Or he may communicate with another plane in mid-air by signals or his secret radio. But *oui*, we shall make him talk, even if we have to—"

Robard broke off, as there came a timid rap at the door which led to the hall. He opened it, still holding the gun which had covered von Lehr. A white-haired old man in a wheel chair was a few feet away, and a skinny little man in rusty black clothing stood at the door. Both the skinny man and the invalid looked dismayed at sight of the gun. Robard lowered it with an apologetic smile.

"Pardon, *mon pere*," he said to the man in the chair, "I had forgotten this little toy. What did you wish?"

The skinny man answered, in a high-pitched voice. "Colonel Reposte here, has a letter asking him to come here. It is from—who is it from, *mon colonel*?"

"I have it here," said the man in the chair, feebly. He fumbled in one pocket, then another, finally nodded his white head, as he reached inside his coat.

"Here it is," he quavered. Then with a lightning movement his hand came out with a Luger and he leaped to his feet before Robard could raise the gun he held.

"Don't move!" he rasped, and with a start Knight saw where his white hair had slipped, exposing a close-cropped head. "Raise your hands, the three of you. A shout for help will bring you a bullet!"

THE WORDS were in guttural, staccato French. As Knight backed into the office with Robard and Doyle, the pseudo-invalid swiftly followed, and the skinny man pulled the wheel-chair inside, then also produced an automatic.

The bright lights revealed the false invalid's gaunt, fierce countenance, and with new amazement Knight recognized the man who had piloted the fourth Messerschmitt. Robard was staring at the be-wigged intruder as though he saw a ghost.

"General Hiede!" he whispered. "*Sacre Dieu*, you must be mad!"

The German's lips curled scornfully. "What danger is there—with such fools as you in French Intelligence? Hitler himself could come over here in masquerade, and you would never doubt him."

Some one came hastily down the hall, and General Hiede stiffened.

"Be ready, Hans!" he muttered.

The skinny man opened the door a little farther, then looked relieved. Sergeant Mireau and another man in police uniform entered hurriedly, came to rigid attention at sight of Hiede. The gaunt German made an impatient gesture.

"This is no time for formality! The two of you go with Hans and straight-

en out that affair in the next room. Hans, you had better take the outer door, to attract attention for a moment."

Hans disappeared, and in a moment a confused murmur of voices sounded from the next room. Hans burst in, gun poised, and Knight saw one of von Lehr's guards jerk frantically at his gun. Hans fired, and the policeman dropped. A brief bedlam followed, then von Lehr appeared, carrying his chain manacles. And Knight noted that there was blood on one end of the set of links.

"Imbecile!" Hiede snarled at Hans, as the skinny spy came in. "Why did you have to shoot?"

"He would have killed me," whined the little man. He spread his hands in a gesture, and inadvertently brought his pistol within a yard of Knight. The tall agent leaped instantly, but Hans' gun went spinning before he could get a firm hold. At the same moment Robard lunged at Hiede. The gaunt general jumped aside with amazing swiftness, cracked the butt of his gun against Robard's head. As the Frenchman toppled, shouts of alarm sounded in the hall. Hiede whirled to von Lehr, who was now covering Knight.

"Take charge! Blame it on the Americans! Get rid of everyone you can!"

He was now back in his wheel-chair, wig straightened, and Hans was behind the chair, pale, shaking, when the door burst open and an airport official came in, two attendants behind him.

"*Pardieu!*" exclaimed the official, as his eyes fell on the unconscious Robard, and a dead policeman near the doorway in the next room. "What in the name of Heaven has happened?"

Von Lehr had a gun rammed against Knight's ribs, and Mireau was likewise covering Doyle.

"These two spies tried to break loose—they killed the officer and assaulted *Capitaine* Robard," von Lehr said savagely.

The official and his attendants broke into a babel of Gallic oaths and exclamations, but von Lehr cut them short.

"Go back and tell everyone it was nothing—only an electric light bulb dropped on the floor. This spy-matter must be kept secret until we can learn all its ramifications."

The official seemed to notice Hiede and the skinny Hans for the first time. His brows drew together as though he were trying to recall something, but von Lehr gave him no time.

"This is Colonel Reposte, a retired officer of Artillery, who gave Captain Robard a tip leading to the identity of these spies."

The other man turned to go, looked down at Robard.

"Hadn't I better send for the doctor, *m'sieu le commandant*?"

"No, it is only a scalp wound—we will take care of him," von Lehr answered quickly.

THE AIRPORT OFFICIAL and his men went out. Von Lehr waited until their footsteps had died away, then

closed the door and wheeled to General Hiede.

"*Lieber Gott, mein General!* You are taking a great risk to—"

"Forget that!" snapped Hiede, springing up from the chair. "We have work to do, if we are to save our plans. We must make off with the Northrop to eliminate the American's set—also, I have a scheme for using it later. But we still need another plane. I flew one of the Messerschmitts and was forced to abandon it and take to my parachute, in order to get here in time."

Von Lehr looked dismayed.

"But what if the ship is found? The crash must have attracted attention?"

"I flooded the engine, and made sure it would burn when it struck," Hiede retorted irritably. "And before I jumped, I radioed Hans to be ready with a car at the old field east of Aubervilliers. I had the plan for my invalid act all ready, so I managed to get here in time to offset your stupid blundering."

Von Lehr flushed. "It was not my fault, *Herr General*—"

"We will settle that later! Our main problem is to get away at once—and take these prisoners with us."

"I had already planned that—at least to take the Americans. My special Dewoitine has been started—" von Lehr turned inquiringly to Mireau, and the spy-policeman hastily nodded.

"*Gut*," said Hiede curtly. "The rest should be easy. I shall want all three prisoners taken; we can undoubtedly force them to give us details of American and French Intelligence which we can use. And the *Plan* must be carried on immediately."

Von Lehr lost some of the color he had regained.

"Then it has really been ordered?" he whispered.

"Certainly!" snapped Hiede. "And every lost minute makes the victory less sure. Hans, wheel me out into the hall. Von Lehr, you and one of Mireau's men come along with the *Amerikaners*. Mireau, you and the other one carry Captain Robard. When we get outside, von Lehr, you will order the Northrop started at once. The engine will still be warm, so it should take only a moment. Meantime, tell the airport superintendent you need a pilot to fly the Dewoitine for an Intelligence matter at Versailles, and that the prisoners and myself and Hans are going in that ship. If they insist on an extra guard or two, very well—Hans and I can take care of them once we are in the air, and then also 'relieve' the pilot."

"And I am to fly the Northrop?" asked von Lehr.

"Did you expect a ghost to fly it?" grated Hiede. He glowered at the false major, jerked his head at Hans. The skinny man pushed the chair into the hall, and Knight and Doyle were marched along behind at gun-point, Mireau's two traitorous policemen brought up the rear, grumbling at Robard's weight.

ON THE FIELD, the Dewoitine was ready, motors idling, when the group arrived. At von Lehr's order, a

mechanic quickly started up the Northrop's motor. Hiede was lifted from his chair and between Hans and an airport attendant was carried into the Dewoitine.

Knight watched desperately for a chance to break, but von Lehr and the man guarding Doyle never relaxed for a second, and the increasing crowd of spectators was growing more audibly hostile every instant.

"I'm going to take a chance, Dick," Doyle muttered through set teeth. "Get set!"

"Idiot!" von Lehr cut in before Knight could answer. "You'll be dead before you lift a hand! Move on!"

"I forgot th' dirty louse could speak English," Doyle moaned to Knight. "What I'd give for just one crack—"

"*Espion!*" came a sudden strangled cry. Robard had recovered his senses,



shouted the alarm before his captors could stifle him. "Help! Major Foix is a German spy!"

One of the spy-policemen struck him a furious blow, but the damage was already done. Half a dozen mechanics and airport attendants dashed through the milling crowd of air-travelers, and customs guards and officials came darting on their heels. The two men carrying Robard lifted him and threw him head-first into the Dewoitine. And now Hiede reappeared in the doorway with his automatic leveled.

"*Espion! Allemander!*" Knight shouted at the top of his lungs.

Von Lehr had spun half around to face the charging officials. He now whirled back, but Knight caught him with a furious left hook and shoved his gun-hand upward. The gun blasted skyward, and the next instant Knight jerked it from the spy's hand.

Hans was almost at the door to the cabin. He crashed two shots into the crowd, was triggering a third when Knight fired. The skinny little spy fell on his face, a black hole between his eyes.

Von Lehr dived madly for the door of the Dewoitine, Mireau and the false police behind him. Doyle brought down one man with a flying tackle, and Hiede's hasty shot at him drilled the shoulder of a mechanic close behind. Knight pumped a bullet at the German general, but Hiede sprang back as he leveled the gun and the slug harmlessly pierced the door. Then von Lehr scrambled inside, and before Knight could reach the airliner, it lurched ahead under hurriedly opened throttles. The sudden blast blew him from his feet. He rolled over, came up to find Doyle struggling in the hands of three or four infuriated Frenchmen.

Doyle thudded an uppercut to one man's jaw, sent another somersaulting backward as Knight jumped into the fight. In a split second, the other two

men were in full flight, yelling for help. Knight dashed for the idling Northrop with Doyle at his elbow. A pistol spurted flame as he sprang into the cockpit, and two more guns opened fire before Doyle could get aboard. One of the slugs drilled the already bullet-torn cowl, and as he ducked he recognized the gunman as one of the false police. The man had missed the Dewoitine, and was now desperately trying to cover up the truth by attacking the supposed spies. Doyle recognized him in the same moment, snatched a flare-pistol from its socket and pulled the trigger.

A rocket-flare streaked across the intervening space, struck the spy in the chest. Above the drone of the engine, Knight heard the man scream, then the rocket-charge burst with a blinding light. Pawing madly at the flames, the man rolled over on the ground. Knight opened the throttle, sent the Northrop racing away from the mob which was surging toward them.

"We're in a swell fix!" he shouted back at Doyle. "Robard's the only one who knows that man was a spy!"

"They can't get any madder than they were," Doyle howled back. "What could I do—let him stand there and blast us down?"

"I'm not blaming you," Knight answered over his shoulder. "But we've only got a single chance of getting a clear ticket. We must force that Dewoitine down and save Robard so he can explain it all. Be ready with your guns!"

CHAPTER IV

TRAPPED

DOYLE levered the twin-fifties up from their niche, and Knight reached toward the retracting-gear valve, lifted the wheels the moment they were off the ground. The Dewoitine was climbing swiftly into the northeast. A searchlight speared out, crossed the airliner, then swung to the Northrop. Knight ruddered to the left, zoomed at full gun. Hardly a second later, tracers made pinkish white lines through the space where the two-seater had been. Another searchlight angled up the sky, and he had to whip into a vertical bank to avoid it. The Dewoitine again was spotted by the first light, but no gun-fire followed. Knight grimly whirled the Northrop and aligned it with the big ship.

"They won't fire on it, as long as they know Robard is in there," he said into the interphone. "Watch out for any ships following us—I saw a fast interceptor back there in a military reserve hangar."

"They probably haven't got a pilot," Doyle yelped back. "It hasn't been wheeled out yet."

Tracer lines suddenly probed down the sky from a point near the Dewoitine's tail. Doyle swore like a pirate as Knight rolled out of the burst.

"Guns in the tail! How do they get that way with a passenger ship?"

"Half the airliners in Europe are made for conversion into bombers," said Knight. "Hold your fire—I'm going to

see if I can find a blind spot."

He raced above the Dewoitine in a tight climbing turn. But before he had more than started to close in a gun-snout poked through a round opening in the top and another blast barely missed the Northrop.

"I'm going to take a crack at their props!" raged Doyle.

"No—you might set the ship on fire!" Knight stopped him. "We've got to think of Robard."

"In twenty minutes more they'll be over the border into Germany," lamented the ex-Leatherneck. "You know what we'll be then—the men without a country! When Paris kicks about this to London, they'll cover up about how they let us use these British registration letters on this job—and Washington won't save our necks."

"I know that," Knight said, half to himself. He knew that was the lot of spies who get caught or who get into a jam. They could expect no direct help from their government, and they were expected to take what came without a word, even if it meant a firing squad.

"Then what are we going to do?" demanded Doyle. "Are we going to let those bums get away with it?"

"No," Knight said flatly. He changed the propeller pitch, climbed at a steep angle until they were well out of range. By now the searchlights at Le Bourget were far behind, but others between Paris and the German border were flicking their way up the sky, trying to pierce the clouds. Both the Dewoitine and the Northrop were soon above the first layer, and as the lights lost their brilliance Knight warily descended, watching the blurred shape of the airliner as the shifting light-beams illuminated the clouds below it.

"Listen!" Doyle said abruptly. He had switched on the radio, turning to the high-frequency wave they had used before.

Sweet and clear, the mysterious chimes were sounding again. For half a minute they continued, then the harmony was shattered by the grating, unmistakable voice of General Hiede:

Hold the second unit! Wait for my orders. M-13, switch off your transmitter and wait for further directions.

"Now what the devil does that mean?" exclaimed Doyle.

Knight had been staring at the bearing-indicator.

"The chimes signal came from somewhere in Paris, or on a line with it. I'm beginning to get a hunch on this business."

"What is it?" grunted Doyle.

"That first Dewoitine must have been guiding on—" Knight broke off, for the high-frequency receiver was again speaking:

Orders received. Will signal as directed.

THERE followed a low-pitched buzz, lasting about three seconds, then two short ones. After an interval of half a minute, this was repeated.

"That's not from Paris!" Doyle said excitedly.

"No, it's from somewhere on a line

north of Longwy, near Luxembourg. That's the nearest German border."

"It must be a radio-beacon to guide that ship in to a field," Doyle said through the interphone. "The fog's probably thicker near the Meuse, and Hiede figures he can't get in without a beacon."

"There's something queer about it," Knight answered. "Why did he switch to another wavelength to give the order for the beacon? If I've figured that old fox anywhere near right, it's a trap for us."

"Well, we don't have to land," Doyle pointed out. "And with this low ceiling, we can duck into the clouds if the going gets too tough."

"We'll have to risk it, anyway," said Knight. "Keep your eyes open."

"I wasn't counting on going to sleep," Doyle retorted. "Hey, look at the Dewoitine! They're trying to lose us!"

The airliner was now nosing down, turning in a northerly direction. The searchlight spots on the clouds were now few and far apart, and it was with difficulty that Knight managed to keep the big ship in sight.

After a minute or two it turned east again, resuming its first course. Knight dropped the Northrop to within a thousand feet, gradually lessening the distance as the darkness increased. Five minutes, and a dozen lightzones showed ahead, as unseen searchlight crews vainly probed at the drifting mists.

"Must be the border, somewhere near Montmedy," Knight said after looking at his map. "I think they're heading just north of Longwy and into the southern part of Luxembourg."

The light spots now fell behind, and he had to close the gap again as the stolen airliner plunged down through the clouds. They had passed, he estimated, the tip of the French area just north of Longwy, and were a few miles into Luxembourg when the beacon-



signal faded into silence. At the same moment the Dewoitine dived steeply into the gloom.

"Must be the cone of silence on the beacon!" Doyle yelled.

Knight made no answer, but sent the Northrop into a swift plunge after the stolen ship. His hand went to the landing-light switch, then he shook his head. Better to risk over-running the Dewoitine's tail than to expose the Northrop to concerted fire from the airliner and the ground. And if his guess were right, there would be massed guns below.

Re-setting the altimeter after checking the map, he eased the Northrop from its fast glide and banked into a spiral, straining his eyes for the first sight of ground. The radio-beacon was still silent, though he switched to al-

ternate wave-lengths to see if he could pick it up. The mists darkened, and he knew that ground was near. Suddenly, their ship broke through into clear air, and he cast a hasty look on both sides.

He could see nothing of the Dewoitine!

Several kilometers distant, the headlights of a car made two tiny spots in the gloom. Another car passed, going in the opposite direction. With this as an altitude check, Knight came down to a hundred feet of the ground, circling carefully. As his eyes became accustomed to the gloom, he could vaguely see that they had come down in a broad valley, with rolling hills on both sides. He was about to start climbing, to be sure of not hitting a hill in the darkness, when Doyle gave a shout.

"Turn back, Dick! I just saw a light flash, a mile south—I think I saw the Dewoitine taxiing."

Knight whipped the two-seater into a turn, and in a few seconds was circling the Northrop over the area Doyle indicated. His pulses leaped as he made out the shape of the stolen Dewoitine, gray against the darker ground. It had stopped moving, but his anxious survey failed to reveal any buildings or hangars nearby. Bracing himself for a quick maneuver if guns should blast, he flicked the landing-light switch. The tilted beams swept over the Dewoitine, caught a solitary figure running toward the cabin. A swift circle, with the lights sweeping over the flat bosom of the valley, failed to reveal any other sign of life.

"Stand by your guns," he said to Doyle. "I'm going to land."

"Look out for that ridge!" Doyle warned him. Knight swung away, made a wide turn into the wind, lowering the wheels as he prepared for the approach. The Northrop moaned down, engine droning just above idling speed. He tilted the light-beams more steeply to flood the landing area, and in a moment the wheels touched. He pulled the throttle full back, stared ahead with fingers on the gun-buttons. Then a wave of astonishment swept over him.

The Dewoitine had vanished!

"Hell's bells!" howled Doyle. "They beat it while we were landing."

Knight braked the ship to a halt, peered up through the Northrop's riddled Plexiglass enclosure. There was no sign of the airliner above.

"They couldn't have got clear that fast," he muttered. "They'd have had to turn around and taxi for enough room to take off."

ABRUPTLY the implication of his words hit him. He sprang up in the cockpit, bumping his head against the enclosure. A crawling sensation went up his spine. Something was moving in the darkness, off to the right. He dropped back in the seat, jazzed the motor to turn and spot the area. In the same moment, a dazzling light shot out and blinded him. He kicked away, stood on the brake pedals.

A gun hurled tracers out of that dazzling light. Doyle answered with a crashing barrage from the 50's, and above the din Knight thought he heard

a scream. He shielded his eyes, sent the Northrop rolling around until his back was to the light. Guns were clattering from two angles, and Doyle was furiously swinging his twin-mount to blast at both. Above the choked thunder of the Northrop, the roar of another engine came with a booming force. Knight shoved the throttle open, praying his half-blinded eyes would not fail.

The Northrop's controls stiffened, and the two-seater bellowed away and broke into the air with the manifold pressure dangerously over the red mark. Off to the left, a sleek black shape raced into view, as a Messerschmitt fighter strove to head them off. Doyle flung a burst at the German, and the pilot pitched over the stick. The Messerschmitt slued around, went onto its back and burst into flames.

The night was instantly turned into daylight brilliance, as the blazing gasoline leaped skyward. Another Nazi fighter was charging across the smooth carpet of the valley, and with consternation Knight saw five more fighters taxiing swiftly into the wind. Back of them yawned a black maw, where the huge door of an underground hangar had opened in the side of a hill. Lit by the flamer, the Dewoitine was revealed just inside the entrance, with dozens of men running about.

An anti-aircraft battery mounted on a truck came whirling out of the secret hangar, behind it two machine-gun trucks. The truck which held the searchlight was pulling to one side, the crew feverishly trying to keep the Northrop spotted.

One of the Messerschmitts pulled up in a perilous zooming take-off, shot back at the Northrop. Slugs gouged for a second at the side of the two-seater. Knight snapped a quick burst at the Nazi pilot, but the other man was out of range in a flash. He gripped the retracting-gear valve, groaned as it came away in his hand. One of the German's bullets had scored a lucky hit. With its wheels down, the speed of the Northrop would be cut considerably.

Desperately, he hurled the ship around and down at the searchlight. If he could blind the Messerschmitt pilots, there still might be a chance. But a terrific fire from the ground drove him into a hasty chandelle. Doyle's guns roared for a second—then went dead!

"Run for it, Dick!" he shouted. "I'm out of ammo!"

Knight grimly booted the nose around toward the nearest fighter. Its smooth dark sides were almost in line with his wing-root 50's as he pressed the master button. Battered dural and steel and bits of wiring shot from the Messerschmitt's cowl as the burst raked over the top. Knight rammed the stick forward, and the blasting force of his guns hit squarely into the German ship's nose. Literally knocked out of the bearers, the engine went smoking and flaming down the sky, and the fighter whipped into a crazy spin.

With a sudden hope, Knight drove through the space he had opened—then snapped the ship around in a violent turn. A hill had loomed straight before

him, too high to zoom across. Tracers from three directions flamed past the wings as he came back. For an instant his taut hand hesitated on the throttle. There was still a chance in a thousand—of plunging straight through, he might by a miracle miss connecting with German bullets. But he slowly pulled the throttle back. It would be practically suicide—and he had no right to doom the man behind him.

With the Messerschmitts swarming around and above, he leveled off and landed—for that was his only alternative. As the ship stopped, he turned and looked at Doyle. A crooked grin was frozen on Doyle's homely face.

"You should have gone ahead, Dick," he said huskily. "It'd be better—that way."

THERE was no chance for answer. At least a score of armed Nazi brown-shirts closed in around the ship, with von Lehr in the lead. The spy's jaw was swollen and discolored where Knight had hit him, and the Q-Agent read murder in the man's protruding eyes.

"Get those *schweine* out here!" von Lehr snarled, and a dozen storm-troopers leaped to do his bidding.

As Knight was dragged to the ground, von Lehr stepped up and struck him furiously across the mouth. Knight lunged at him, but a horde of brown-shirts threw themselves on him and he went down. Kicked and beaten, he was lifted to his feet and carried half-senseless toward the secret hangar. He could dimly hear Doyle cursing the Germans, and the sounds of a scuffle.

But as he was taken into the entrance of the hidden hangar, the shock of his beating began to wear off, and though the pain increased he could think more clearly. In spite of the agony which the jolting of his captors caused him, he tried to take in the details of the secret base.

It was obvious that the cavern was artificial, an excavation made for the purpose of hiding a large air unit. Walls, floor and roof were of concrete, with iron pillars to support the roof trusswork. The hangar was divided into three sections, with several huge Junkers 86 bombers on one side, and two rows of Messerschmitts on the other. In the rear were shops and partitioned space for war-time quarters, only part of which seemed to be occupied now. The entire space was lighted by electricity, and he saw that the big balanced door, camouflaged expertly to look like the rest of the hillside, was operated by electric motors.

He kept his eyes slitted, so that his captors would not realize he was conscious, though now and then a jerk brought pain that almost made him groan. Ahead, he saw Robard, guarded by two Nazis, and General Hiede in the midst of a group of officers. Hiede glared toward the approaching brown-shirts.

"I told you not to kill the American!" he said savagely.

"He is not dead, *Herr General*," one of the men spoke up in haste. "He was

only knocked senseless when he tried to kill Major von Lehr."

"And the other?" demanded Hiede. "Ach, I see they have him—and alive. Put this one down and douse him with a bucket of water."

Knight was dumped on the floor. He opened his eyes, knowing further shamming was useless.

"So, you were trying to fool us—hoping for a chance to escape!" fumed Hiede. "Stand up, *Amerikaner* dog!"

Three Nazis gripped Knight and yanked him to a standing position. But for their support he would have fallen. One of the officers, a square-headed colonel with a face as fat as a pig, looked at him in fascination.

"Then this is the Q-Agent—Knight?"

"Ja, Moltke," said Hiede, "this is the great American spy. He does not look so very clever now, *nein*?"

Moltke shook his head, twitched a glance at Doyle, whose crooked nose was bleeding copiously from a blow it had received.

"Gott, what an ugly-looking *Hund*!" he exclaimed.

"He will look even uglier," von Lehr broke in viciously, "when I am through with him—and this over-rated *spion*, Knight, too."

"There's no time to waste on that now," snapped Hiede. "Take them into my office," he added, with a curt gesture to the senior brown-shirt. "Moltke, have preparations made at once to go on with the orders. Have the Northrop plane refueled and made ready for the London trip. That move is timed for shortly after the Paris action."

Robard spoke up, white-lipped.

"There will be a special Hell for you, *Herr* Hiede, if you go through with this!"

"You speak like a child," said the gaunt Nazi, contemptuously. "But you French were ever childish."

He jerked his head, and the prisoners were hurried into a hall which ended in a paneled room. An enormous wall map of Europe hung directly opposite a large desk, and colored lights were lit at various points. A radio amplifier was plugged into a connection on another wall. Knight saw a red leather book and a photostat of a chart on the desk on which several numbers and letters were checked in colored crayon.

Robard stared from the map to the photostat, and the last vestige of blood fled his cheeks, leaving them the color of old parchment.

"You fiend!" he whispered. "Then you were not lying!"

For the first time, Knight heard Hiede laugh. It was like the croak of a vulture.

"So you thought it was a trick, my popinjay Frenchman? You blind fool, by midnight all Europe will be plunged into war!"

CHAPTER V

TEST-STAND OF DEATH

FOR a space of ten seconds, there was only the tense breathing of the men in the room. Robard stood like a statue, eyes riveted on the light-dotted map.

Hiede saw the staring brown-shirts, turned fiercely to the senior man.

"Tie the prisoners' hands and leave them here!"

The Nazis hastily obeyed, left the room. Hiede closed the door, looked strangely at von Lehr.

"It is time you knew. But first, are you sure everything is right in Paris—that this affair with the *Amerikaner* will not upset the arrangements?"

"There is no danger of that. No one could trace my agents, and the green light shows they are waiting."

"Excellent," grated Hiede. "Then my plan cannot fail."

"Your plan?" von Lehr said hoarsely. He looked at the gaunt general in horror. "But I thought you said *der Fuehrer*—"

"He waits too long!" Hiede said with a sudden fury. "The *Generalstab* waits—everyone puts off the day, afraid we are not quite ready. And all the time England is arming at twice our rate—with all her resources building against us. And France—never will she be less organized—more ready for the slaughter!"

Von Lehr backed away as though he stood before a madman.

"But, *Gott im Himmel*, when *der Fuehrer* finds out—we will all be shot!"

"Not if we show them the way to victory!" A fanatical glow shone in Hiede's sunken eyes. "With France blazing before dawn, and England's capital also in flames, the war will be half-won. Plan Four will be carried out to the smallest detail—every available ship and pilot and our mechanized forces will be thrown into the surprise attack. France will be beaten before noon tomorrow—paralyzed to point of surrender. And London will clamor for a peace-pact when they realize they would stand alone."

Perspiration ran down von Lehr's face.

"But even now, Hitler and Goering may know—may be on the way. The *Gestapo* may be here any second to arrest us—"

"You whimpering coward!" thundered Hiede. "I offer you a chance to gain immortal glory—but you cringe at the slightest risk. Don't worry about *der Fuehrer* and Goering. There is no chance of their learning in time to stop us. I've been waiting months for this opportunity—a time when they'd be off at some remote spot—and tonight they're at the old chateau in Mecklenburg, holding a secret conference with *Il Duce's* representative from Rome. I've arranged so that their power-line will be cut and the bridge at Ansheim has been blocked by an 'accident' so they can't return that way. As you know, there are no telephones to the chateau—and without power the radio will be useless. There is no way they could learn."

"A plane could fly over—drop a message," mumbled von Lehr.

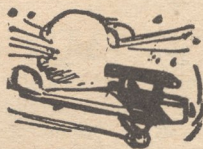
"But no one will know anything is wrong," insisted Hiede. "I've shifted the emergency signal control to this circuit for eight hours. At Berlin they will think, when the action starts, that this is the explanation of Hitler's sudden

disappearance—that he is controlling the attack from here. I have already given the stand-by signal for all our agents in England and France. And all our pilots have been recalled secretly from leave; I saw to that, making next week's maneuvers the excuse."

"Then as soon as the first air phase is started, I'll flash word to all our mechanized units and the *Untersee-boats*. Everything will go like clock-work—air, sea, land, and sabotage in the enemy lines. Once it is started, not even Hitler himself can stop our war machine from going forward."

"You're stark mad!" Robard broke in. "You'll never beat France!"

"Nein?" sneered the gaunt German. "Perhaps this will interest you. In that first Dewoitine was enough arsenic-base gas to spread over an area two kilo-



meters square. Unfortunately, the ship was too high when it exploded for the gas to take effect—it expands rapidly, and it lost its power by the time the diluted mixture settled to the ground. But the next ship will crash as intended, before the gas is released, and everyone along the Quai d'Orsay and a kilometer on both sides of the Seine will be dead or dying in less than fifteen minutes!"

"The defense interceptors and the anti-aircraft will destroy the ship before it can hit Paris," Robard said desperately.

"I think not," said Hiede. "We will use that Dewoitine which von Lehr equipped with one of our special radio-guide sets. Your pilots and gunners will not be sure enough that it is the stolen one. In any event they would be afraid you are still in it, a prisoner. And with that low ceiling they will not have much time to decide. An automatic transmitter will be switched on in a certain room at the Chamber of Deputies, where I happen to know there is a struggle going on tonight against Daladier's government. The Dewoitine will follow the signal like a homing pigeon, will destroy your Deputies and the War Ministry—and France will be left without leaders at the moment our attack begins!"

"That chimes signal!" Robard said hoarsely. "So this is the answer!"

THE GERMAN replied with a malignant grin. "We have a score of those sets. Some are in Paris, others at vital points such as your defense squadron fields around the city, and your main industrial plants for war material. There are several in London, also. As soon as we receive word that the first one has struck Paris and the panic has begun, we will send the others at one-minute intervals. Meantime, the Northrop plane will be equipped with a control-relay box and then loaded with as much arsenic-gas as it can carry, along with explosive and incendiary bombs as were in the first Dewoitine. That load

of hell will be aimed at Number Ten Downing Street, and if I know the English every important man from the Premier to the heads of their Intelligence will be caught there as they await further news from Paris. In short, England, too, will be left without leaders."

"But why wait, *Excellenz*," von Lehr interrupted nervously, "for the Northrop to be equipped when our Junkers are ready?"

"Because we could not get English motors for them," snapped Hiede. "This Northrop was expected at Croydon tonight—Moltke told me he heard this man Knight inform them he was changing his course to go to Paris, so they would not report him lost in the Channel. We will make him flash a message that he has changed his mind, and thus the Northrop will not be questioned when it crosses London. The radio-guided Junkers will follow while London is disrupted by the first shock, and our regular ships will race in according to the schedule, the same as in France."

"If only there is no slip!" von Lehr muttered.

"What could happen?" snorted the general. "Every detail has been figured out, all movements at sea and on land dove-tailed. *Ach*, I have waited and lived for this moment! Ever since 1918, when those devils ruined the Fatherland, I have waited for vengeance. I was only an *Unter-Leutnant* when they drove us back, and crushed us with their damned Armistice terms—but I knew then it was my mission to avenge Germany. And my hour has come!"

The germ of a wild hope had sprung up in Knight's mind as he saw the fear in von Lehr's eyes and the mad gleam in those of Hiede. When the gaunt German flung out the last words, Knight threw a swift, warning look at Robard and then burst into uproarious laughter.

"It worked, *capitaine*!" he shouted. "They swallowed it, the fools!"

Robard, after a split-second stare of amazement, took the cue and joined in Knight's laughter. Hiede's jaw dropped, and von Lehr looked at the two men in sudden alarm.

"Silence!" roared Hiede. He gripped Knight's arm with bony fingers. "What in the *Teufel's* name is the meaning of your cackling?"

"You and your smart spy!" Knight jeered. "You thought it was an accident that the Northrop was circling around the Eiffel Tower when that Dewoitine came over! You never wondered why Robard happened to be in that next room! The whole thing was planned, my brilliant general."

Hiede whirled on von Lehr with a snarl.

"If they knew—it was through you!"

"He's lying!" von Lehr cried wildly. "Remember that Robard was astonished when he heard the explanation of the chimes."

The Frenchman laughed in his face.

"Blockhead of an *Allemand*! That was to delay you two from warning your spy-ring in Paris before my men could round them up and seize those sets. Weeks ago, *Monsieur* Knight caught your first test-signals and sent

us word through American Intelligence. He followed your supposedly secret flights with his Northrop—night after night. Send your hell-ships across! They'll be guided back here into Germany—against your own cities, by our own ships carrying those chimes-sets!"

THERE was froth on Hiede's lips, and his eyes blazed like hot coals. "Thick-witted fool!" he screamed at von Lehr. "If this is true, I'll hang you with my own hands!"

"It can't be!" von Lehr moaned. "They're trying to trick you to gain time—I swear I was never followed."

"We'll soon know!" snarled Hiede. He jabbed a button on the desk, and Moltke hurried in. "Is the Dewoitine ready?"

"Almost, *Herr General*," Moltke answered, with a startled look at Hiede's white face. "What is wrong?"

"Perhaps everything—but we will be ready if they were lying. Start the Dewoitine's motors—have all the Junkers started and detonators set. Then return here and give the stand-by signal to all forces!"

Moltke's fingers were shaking as he picked up the keys Hiede threw on the desk. The general strode to the door, bellowed an order, and returned with two brown-shirts. Then with Hiede and von Lehr following, Knight and the other prisoners were hustled down the hall, through the shop-section of the secret hangar, and finally into an engine testing-room where a Mercedes-Benz motor with a steel propeller stood on the block. Close by was a movable work-stand—a platform erected on rollers so that mechanics could adjust the chain tackle for lifting the motor and moving it out on an overhead track.

In an adjoining space was a pile of oil-cans, several petrol drums, and an opened packing-case. Five or six wax dummies were scattered around the floor, evidently left-overs from the ones which had been used to look like the passengers of the big Dewoitine when it was sent over Paris. Hiede closed the door, pointed at Knight.

"Tie him face up on that work-stand, with his head hanging over the edge."

An icy chill ran up Knight's spine as he realized Hiede's intention. Von Lehr laughed harshly.

"Now you see where that crazy lie brings you, *Herr Q-Agent*!"

"Wait!" Robard said in a choked voice. "General Hiede—you cannot do this horrible thing!"

"You French use the guillotine—we have our own methods!" snapped Hiede. He wheeled to one of the brown-shirts as they finished tying Knight to the platform of the work-stand. "*Schnell!* Start the engine!"

A starting-motor growled, and with a sputter the Mercedes-Benz whirled into life. Doyle, unable to follow the conversation because it had been in French, began a furious struggle to free himself and aid Knight as he realized Hiede's purpose. But von Lehr and a brown-shirt hauled him back, and the thunder of the engine drowned his frenzied voice.

The work-stand jerked, moved for-

ward a foot or so, as Hiede signaled for the remaining storm-trooper to push it. A cold horror raced over Knight. The flashing steel blades were less than a foot from his face. Another foot, and he would be decapitated!

CHAPTER VI

SONG OF DOOM

HIEDE made a peremptory gesture, and the brown-shirt held the stand where it was. Pistol in hand, the gaunt German mounted half-way up the steps and bent over Knight, while the troop-mechanic idled the engine.

"Are you ready to tell the truth?" he rasped.

Knight tried to speak, but his tongue stuck to the roof of his mouth. Hiede shouted a profane command to the trooper, and the stand moved an inch or two closer to the bright disk that meant hideous death. Knight closed his eyes and lay there in a frozen agony, with the suction from the blades pulling at his hair. Hiede shook him savagely until he opened his eyes.

"I give you a last chance!" the general shouted above the roar of the engine. "Answer me or into the blades you go!"

The pound of his fist shook the work-stand. Knight rolled his frantic eyes toward the gun in Hiede's hand, helplessly moved his head in surrender. Hiede's eyes narrowed, and his teeth showed in a wolfish grin.

"*Nein, Herr Knight*, you will not have the chance to seize this pistol. Your intentions are a little too obvious—but I suppose fear makes even such a clever man stupid."

Knight held his breath, hardly daring to hope his prayer would be answered. Hiede motioned to the Nazi who had started the engine.

"Untie his feet first. If you free his hands he will try to get my Luger, and I do not wish to shoot him—yet."

Down below, von Lehr and the other brown-shirt had herded Doyle and Robard into a corner, were holding them at gun-point. Both prisoners still had their hands tied behind them. Knight fought off a sudden faintness which followed the shock of his near approach to death. The Nazi mechanic clambered up on the steps beside Hiede, crawled on to the platform, and untied the rope which held Knight's feet to the boards.

The secret agent let himself go limp, eyes fixed glassily on Hiede. If only the brown-shirt came forward on the side toward the general . . .

He felt the ropes slaken on his feet. The mechanic twisted around, taking care not to jar the work-stand and move it on its casters. He crawled forward between Knight and Hiede, was unfastening the agent's wrists when the general bellowed something at him, and took a step farther up the ladder to keep Knight covered. The brown-shirt turned around at Hiede's shout, and with a desperate effort Knight jerked his feet up from the boards.

His kick sent the mechanic tumbling over on Hiede, and their combined weight threw the stand sidewise. It slid

from under on its casters, whipped sideways with a crash that threw Knight squarely upon the trooper. He jerked his hands from the already half-loosened rope just as Hiede slammed the trooper aside and lifted his Luger.

Knight's dive and the muffled crash of the gun came as one. He felt the slug sear along his left shoulder, but his hands were now on the gun, tearing it from the general's bony hands before Hiede could fire again.

Then from across the room flame jetted as von Lehr took wild aim and fired.

The bullet from von Lehr's gun smashed against the wall, and Doyle hurtled against him with head lowered like a bull before he could trigger a second shot. The spy fell, breath knocked from his body, and Robard tramped on his outstretched gun-hand. The brown-shirt who had covered the Frenchman had whirled to fire at Doyle. Knight pumped a shot into the man, and he doubled over, dropping his pistol.

The Nazi mechanic dived for the fallen gun. Robard lashed out with a booted foot and kicked him away. Then Knight rammed his gun into Hiede's ribs, drove him back against the wall, then stepped out of reach.

"Stand up!" he shouted at the man Robard had kicked.

DAZED, his bruised face showing the force of the Frenchman's blow, the man obeyed. Doyle was still on top of von Lehr, trying to get his hands loose before the spy recovered his breath.

"Untie him!" Knight flung at the Nazi mechanic. "Keep on his right side while you're doing it!"

All the fight had gone out of the man. He unfastened Doyle's wrists, then staggered over to Robard, and untied his bonds without even a word from Knight. Hiede cursed him foully, but the grim look on Knight's face kept him from making a move. Doyle snatched up von Lehr's automatic, covered the gasping spy while Robard took the gun the dead German had dropped.

"At least, we die fighting," the Frenchman said tautly.

"We may get out of this yet," Knight answered. He stepped back, keeping Hiede covered, and looked swiftly around the room. "Doyle, you and Robard bring two of those dummies over here. I'll watch these men."

"What's the idea?" said Doyle, when he and the Frenchman had brought over two of the wax figures.

"Take off your coats—put them on the dummies in place of the ones they have. And you, General Hiede—I'll trouble you for your uniform blouse."

"*Schweinhund!*" Hiede spat at him. "I'll burn you alive for this!"

"The blouse!" snapped Knight, with a jab of his gun that brought an oath from the gaunt German. As Hiede furiously unbuttoned the uniform, Knight motioned to the storm-trooper. "That shirt and swastika will come in handy. Take them off!"

The Mercedes-Benz was still idling, its droning thunder echoing through the test-chamber. Knight stood where he could see the door. The sound of the

engine had drowned the shots, he knew, but at any moment some of the Nazis might appear. And there was no way of barring the door from the inside.

"All set," Doyle reported, laying down the dummy on which he had put his coat. "Now what?"

"Put on that trooper's shirt and the swastika. Captain Robard, you're almost as tall as Hiede—you take his blouse and his cap, too."

"You fools!" von Lehr snarled from the floor. "You'll never get a hundred feet before you're recognized!"

"So you've recovered your voice?" said Knight. "Suppose you line up here with your friends and keep still."

Von Lehr got to his feet, his face a sickly color, and leaned against the wall. Knight was about to continue his instructions to Doyle and Robard when a light flashed on the wall beside a telephone. Hiede tensed for a leap, but Knight swung his Luger instantly.

"Not so fast, *Herr General*. Doyle, watch his *Excellenz* while I see what this is."

He lifted the phone, barked a gruff "Ja?" in as near an imitation of Hiede's voice as he could achieve, relying on the roar of the motor to hide any discrepancy.

"General Hiede?" came Moltke's anxious query. "The Dewoitine is ready for launching."

"I have made a change in plans," Knight grated. "Start the Northrop and put it first in line and two Messerschmitts behind it."

"But, *Herr General*," expostulated Moltke, "the Dewoitine is up against the door, and one of the Junkers is next. It will take twenty minutes to move—"

"Open the door, and taxi the Dewoitine outside, then," Knight harshly interrupted. "If you have to move the first Junkers outside, do that also. But I want the Northrop and the two fighters ready in five minutes. Information we just forced from these *verdammte* swine has made a sudden change necessary. We will be there by the time you are ready—and be sure to dim the lights in the hangar when you open the door."

He slammed down the phone, wheeled to Doyle and Robard.

"Here's my plan. You two will go out of here, walking those dummies, as though they're prisoners. With the lights dim, the chances will be ten times better—and most of the men will be up near the entrance. Get as close to the Northrop as you can before you drop the dummies. Let the heads hang forward—the Germans will think the prisoners have been beaten and are about to collapse. Unless you have bad luck, you ought to get near enough to the ship to make the break."

"What about you?" demanded Doyle.

"I'll take one of the Messerschmitts—and if either of you gets separated, make for the other fighter. I'll stay here, to be sure our friends don't break out and give the alarm, until you're part way to the Northrop. Don't worry—I've figured out my escape."

DOYLE began another protest, but Knight cut him short. Carrying one of the dummies, Doyle opened the

door cautiously. The rumble of motors added itself to that of the Mercedes-Benz, and with quick relief Knight saw that the lights had already been dimmed so that no glow would shine from the second entrance. He kept the three Germans covered until Doyle and Robard had disappeared in the gloom, then herded the prisoners into a corner.

"I'm going to be just outside that door," he said grimly. "I'll stay there until that Northrop starts—and the first man that pokes his head outside will get a bullet in it."

None of the trio answered, but Hiede's gaunt face was purple with fury. Knight swiftly backed to the door, opened it, and stepped outside. There was no lock. He moved to one side, where he could watch the door and also look toward the entrance of the base. He could dimly see the wings of a huge Junkers moving through the entrance, and mechanics and pilots swarming around like wraiths in the gloom. The base was so dark he could not tell one figure from another, even when the exhaust of the motor momentarily flared up in the shadows.

Knight started as the roar from the Mercedes-Benz rose deafeningly in the test-room. He reached out toward the door, then stopped. Revving up that motor might be a desperate hope that some of the Nazis would investigate, but it was unlikely they would think of interfering with Hiede. It was more likely that Hiede and von Lehr expected him to open the door, which would give them a chance to jump him, or knock him out with a barrage of tools from three directions.

The engine was now wide open, shaking the walls of the test-room with its fierce vibration. And still no sign of action near the entrance. Doyle and Robard must be waiting for a chance—perhaps the Northrop was not even started

Then Knight went rigid. Two men had just appeared around a ship less than a hundred feet away. He could vaguely distinguish a plump figure, and in a second realized the one on the right was Moltke. He sprang back into the shadows, gun lifted.

Without warning, the door and part of the test-room wall burst open with a terrific crash. A drum of fuel suspended in a looped chain sailed out into the hangar on the overhead track. Moltke gave a yell, and the other man hastily switched on a flashlight. Knight had hurled himself back, the drum missing him by only a foot or so, and now the beam of light fell upon him. At the same moment the roar of the engine broke, and Hiede's voice rose furiously from within the room.

"The prisoners have escaped! Close the main door!"

Moltke had clawed for his gun at the moment Knight was revealed. As his pistol flicked up, Knight blasted a shot at the flashlight, and the colonel's bullet ploughed into the shattered wall. Knight ducked under the still-moving fuel drum and ran between two ships, while the frenzied voice of Hiede rang behind him. He was near the center-

aisle between the fighters and the bombers when a pistol spat flame near the entrance. A commotion instantly arose, and guns began to spurt from two or three directions. Above the tumult, a bell clanged, and lights abruptly went on.

The Northrop was directly in line with the entrance, motor idling, and Knight saw Doyle darting toward the ship.

In front of it, where the fight was centered, Robard was crouched over in the cockpit of a Messerschmitt which blocked the Northrop's way. A huge Nazi leaped at the Frenchman, rifle lifted. Robard flung up his hand, hurled his empty pistol into the man's face. The German fell back, and Robard threw himself down at the controls. The Messerschmitt roared out onto the smooth floor of the valley, amid a flurry of wild shots.

Knight, unobserved by the men at front, reached the side of the Northrop as Doyle halted, looking around desperately. A bellow from the rear brought a dozen Nazis dashing back, as Hiede caught sight of the two Americans. With a whoop of relief, at sight of Knight, Doyle vaulted into the rear pit and Knight made the front one in a frantic leap. He seized the throttle, but as he pushed it ahead his heart leaped into his throat.

The huge door was starting to descend!

Knight rammed the throttle full on, and the propeller blast blew Hiede and their other pursuers back in a heap on the floor. At one side, an automatic rifle stuttered above the roar of the Wasp, but Knight never moved his head. For a fateful second, he thought the door would trap them in a headlong crash. Then the Northrop whirled past underneath, with its prop clearing by inches.

OFF to one side, a remote-control radio set had been wheeled out for dispatching the robot-ships. An officer at the switches had sprung up, was staring wildly at the Northrop and Robard's ship. Knight kicked around into the wind, and in the same moment a machine-gun near the entrance whirled to rake the ship. In his hasty swing of the weapon, the gunner overshot, and the Nazi radioman fell over his set, riddled. The Dewoitine, idling a hundred yards away, instantly began to move. By the time Knight had the two-seater at flying-speed, the death-laden airliner was fifty feet above the trees and climbing into the darkness.

"We've got to stop that ship!" he shouted back at Doyle. "Give it a burst!"

"My guns are empty!" Doyle yelled back. "You'll have—look out, here comes a Messerschmitt!"

Knight jerked his head, saw not one but two of the black fighters dart out of the secret hangar. The door had been lifted again, and in that hasty glance he could see another fighter being pushed out for starting. The first Messerschmitt raced through the glare of light from within, and he recognized the half-clad figure of General Hiede. A black shadow pitched out of the night, and Robard dived steeply at the Nazi

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general. Ground-guns met him with a fierce defense, and he was driven into a hurried zoom. The fighter behind Hiede pulled up in a tight climb, guns warming in short bursts as it drilled after the Northrop.

Knight groaned as he remembered that the retracting-gear was useless. At their reduced speed, and with rear-guns empty, they would be easy meat for the infuriated Germans. He banked hastily in the hope of escaping into the darkness, but the pilot of the second fighter drove him back with a venomous barrage. Tracers and slugs thudded into the Northrop's left wing. He whipped around as tightly as he could turn, tripped the cowl 30's. The Messerschmitt leaped sidewise out of the blast, and for an instant he saw von Lehr's face through the fighter's cockpit enclosure.

With a swift bank, von Lehr cut inside of Knight's turn. Flame streaked from his four guns. But in the split-second when Knight gave up hope, another blast of flame drilled the sky and Robard dropped on von Lehr like a black-winged hawk. The Frenchman's bullets struck into the side of the German ship, and like a blazing, giant saw, cut the fuselage in two.

The front half of the ship plunged into the ground, and fire plumed up, hiding the spot where von Lehr's body was burning. Robard made a frantic gesture to Knight, pointing off toward the west where the Dewoitine had disappeared, then whirled back to engage Hiede's ship. Knight shook his head—with the wheels down, they could never hope to overtake the fast-cruising death-ship.

Then a grim inspiration struck him. He switched on the radio, setting it at the wave-length where the chimes signal had been heard. Something electric seemed to fire his blood as he heard the harmony of that ominous signal.

He snatched up the hand-mike, pressed the transmitter switch, and let the microphone dangle out through the shattered enclosure—in the full roar of the motor.

Robard was fighting a losing battle between Hiede and the ground guns, diving at the hangar entrance between each brief lunge at the German. Wide open, at more than three hundred miles an hour, the two black ships plunged toward each other, then overshot, whirling off into the semi-gloom before either pilot could turn.

Another Messerschmitt was now swiftly taxiing out. Knight nosed down, held his ship in a screaming dive until the German was straight in line with his guns. His fingers shifted to the master-button, pressed hard.

Bright lines shot from the Northrop's nose, into the taxiing ship. The black fighter yawed, crashed into the side of the hill, and rolled back in a ball of crumpled metal. Doyle gave a yell of warning as Knight zoomed, and a cold hand seemed to touch the Q-Agent's heart. He had used his last belt on the ship below—and Hiede was plunging in like a madman, with Robard too far away to come to their rescue.

HOPING against hope, Knight reversed, but the Messerschmitt followed through. Hiede's guns blasted. His tracers were curling in for the death-stroke, when out of the night came the bomb-laden Dewoitine, diving head-on at the Northrop.

With a frenzied turn, Hiede whipped around to flee. Knight spun the Northrop in a violent split, dived after the terrified general. Over his shoulder he saw the Dewoitine plunge down on his tail. Doyle had sprung up in his seat, was staring white-faced at the pilotless liner which was now answering to the Northrop's set as though attracted by a great magnet.

Hiede's mad turn had thrown the Messerschmitt out of control. He caught it, two hundred feet above the valley, with the entrance to the secret hangar almost directly beyond.

Knight shoved the stick forward, took the transmitter switch in his ice-cold fingers. Down roared the Northrop, straight at the hidden base, straight at the zooming Messerschmitt. Hiede flung around, his gaunt face a mask of horror. In that moment, Knight flipped the switch and jerked the stick back to his belt.

One hundred feet from the great door, the Northrop-lured Dewoitine struck. Flame shot up, scorching the side of the hill, and a terrific concussion shook the sky. A vast spout of fire shot out from the hillside, and the black fighter of General Hiede was gone like a moth in the flame.

A minute or two afterward, with Robard cruising close by, Knight stared down from four thousand feet, waiting. Suddenly a titanic eruption split the hillside beneath, as fire reached the massed ships inside and set off their bombs. When it was over, only the flames lived there in hell's hangar.

Knight, abruptly conscious of the throbbing wound in his shoulder, drew a long breath, looked back at Doyle.

"Guess you'd better take over, Lothario," he mumbled through the interphone. "Follow Robard—he'll clear things up by radio before we land."

Doyle took the dual controls, his homely face still pale.

"I thought we were goners, Dick," he said.

"So did I," said Knight. Then he realized that the automatic chimes-beacon signal was still sounding in the receiver. He looked down at the amplifier. But for that little box, a Nazi fanatic would have plunged Europe into war. But Fate had doomed Hiede and his madman's scheme. Mars was still hooded,

and the peace of Europe was saved for yet a while.

It was an ironic end for the mad-

man's scheme. For Hiede had written that music for Death to play—and now he had paid the Piper.

Slowly, Knight reached down for the receiver switch. There was a click, and the music of Death was stilled.

"Alone" In the Air!

(Continued from page 13)

tear, dark and sodden with blood.

"ALONE" IN THE AIR!

SLOWLY but with sickening certainty, the realization of what had happened took possession of young Conroy's shocked senses. That rocker box cover! It had come off just as Macklin had raised his head above the protection of the windshield. It had come off and, whipped back by the driving slipstream, had struck the instructor with stunning force!

"Mac!" cried Conroy, frantically turning in his cockpit. "MAC!" he shouted again, putting all the power of his young lungs behind it. But his yelling was engulfed by the wind, even as it was uttered, and flung into nothingness beyond the tail.

Jack ran a dry tongue over drier lips. Then he tore his eyes away from the unconscious pilot and glanced fearfully over the nose of the plane. And he cringed at what he saw—for the whole world was now awry like a scene painted on a vast, crookedly hung canvas. The horizon angled sharply from his upper left wing down to the tip of his lower right. And they were plummeting down the heavens!

It was then that the old delusion that the plane was a level, stationary vantage point from which he was viewing a cock-eyed universe gripped him, and it was with difficulty that he forced himself to recognize the fact that it actually was their plane and not the world which had gone off center.

Heart beating in his throat, Conroy knew that he had to get hold of himself. "Our left wing's down . . . left wing's down," he kept muttering between gritted teeth. "The left wing's down! I got to bring it up . . . I got to! And the horizon—it's 'way up in the air!"

He yanked the stick hard to the right. Immediately, the horizon line swung like a teeter-totter—swung level and somewhat past. Jack groaned. Overcontrolling! Then through his mind began to run advice Macklin had previously given: "Easy . . . take it easy. Your grip on the stick should be light. Fly your ship—don't fight it. . . ."

But though the horizon was not as much aslant as formerly, it somehow had now dropped far below the nose of the plane and the motor roar was slowing appreciably as flying speed was lost. And with that, the stick began to lose its rigid feel, and terror born of a sense of helplessness gripped Conroy. One of his hands now darted toward the catch of his safety belt, and the other, relinquishing a sweaty grip on the stick, checked the location of the rip-cord ring at his left shoulder.

He slid his feet up from the rudder pedals and got them under him. But as he started to rise from his pit, his fear-widened eyes settled again on the little rear-view mirror that reflected the still face of the unconscious pilot—and on that instant, Jack Conroy knew that bailing out was not the answer.

"I'll fly her, Mac . . . I'll fly her!" he gritted, dropping back into the seat. "You'll come to. You'll have to . . . please, Mac!"

"Again his hand found the stick and his feet the rudder pedals, and again memory came to his aid: "When in doubt, get the nose down." Easy now . . . steady . . . steady—there! Now, the wings. Level 'em up. Steady. Now fly it! Ah! The horizon was back where it belonged.

A quick look over the side revealed to Jack that he was heading for the ocean just a few miles west of the field. That wouldn't do. He'd have to turn.

His lips thinned, but he didn't flinch at the prospect. Deliberately, he dropped the nose to insure adequate speed for a maneuver he knew would be sloppy. He took a deep breath. Well, here goes . . .

Suddenly in his ears came a weak but familiar voice: "Knees close together, kid. The leg in the road is the one to use."

For a second Jack sat motionless, mouth agape. He was not sure he actually was hearing those words. Maybe his imagination had the better of him.

But then a glance in the mirror told him that Macklin's head was no longer lolling. Then he saw the instructor's white teeth flash in a reassuring smile that made his blood-drained face appear less ashen.

"Thank Heaven!" Jack blurted out. And abruptly he felt weak all over. He shook his head, then shakily lifted his hands to show he no longer was on the controls.

"Okay! I've got her!" came through the Gosport. And the plane swung in a clean turn back toward the field.

* * * *

Later, after he'd had his head dressed, Macklin came into the flight office where Jack was waiting. He came up close to his student and stood for a moment looking down at him in silence. Then he extended his hand. "Good going, Conroy," he said simply.

"Ouch!" mumbled Jack as those powerful fingers closed on his.

But he was quite sure nothing had ever felt so good before. . . .

Quickly recovering from his head wound, Chet Macklin gets back on the field with his students in short order. His schedule calls for Jack Conroy's third lesson in next month's FLYING ACES. And to all you sky-minded fans we say: Don't miss it!

I Got a Job With Seversky!

(Continued from page 7)

I was given the job. That meant I had now received three promotions and three raises in a little less than seven months.

This clerking brought me into the wing department, thus giving me a chance to learn something about how the Seversky wings are constructed.

Stringers and initial ribs are put on the wing jigs with the aid of a surveyor's measuring instrument, thus enabling them to get within 1/64-inch of plan specifications. The other ribs and stringers are then fitted in position and covering is begun. A layer of corrugation is first riveted over the ribs, then the outer skin is riveted to the corrugation. This process is comparatively simple to explain—but in actual work it takes several weeks to finish a set of wings.

In the center section, one man was assigned to the job of testing the gas

tanks for water tightness. One day, after completing his work, he went off to find one of the Army inspectors to survey his handiwork. And when he returned he was amazed to see a school of gold fish swimming around in his test tank! Anyhow, it was pranks like this that made life happy in the factory.

Usually, the old gags didn't work, but there was one chap who certainly "fell" for a hairy one. He was sent after a bucket of propeller pitch, and everyone along the line, being tipped off he was coming, sent him some place else. It was more than an hour before he finally found out that his leg was being pulled.

AS THIS is written, I am continuing my work of clerking. But I have applied for a transfer to the

company's publicity department; and if that comes through, I'll be mighty pleased, for it's aero publicity that appeals to me most. Even without the transfer, though, I have no reason for complaint. Since I'm still quite young, there's plenty of time. Eventually, I'll "make it," I'm sure.

I don't think that my getting a job in an aircraft factory is exactly exceptional, by any means, even though I've had more than my share of good luck. Heck, fellows, you should be able to do as good, if not better, than I have. After all, there are sure to be more opportunities than ever, with the present boom in both civil and military aircraft manufacture.

Keep pounding away at it until you get your start, and keep learning all you can about the specific branch or

branches of aviation that interests you. Some of you boys who read these lines may become "big shots" in America's

aviation of tomorrow. If you start learning early and get all the experience you can possibly hold—who can tell?

The Market Log

(Continued from page 53)

at \$21.00. This price also covers coil, condenser, spark plug, and gas tank. Specifications are as follows: Bore, .900"; stroke 31/32"; displacement 10 c.c.; r.p.m., 1200 to 8000; weight, 7 1/4 ozs., and height 4 11/16".

Ohlsson Miniatures are working on a new gasoline motor which, we are informed, will be about half the size of the present popular Ohlsson Gold Seal Miniature. It is reported that the "baby" will be built to the same rigid requirements as its big-brother, except that it will be recommended expressly for small jobs. No further details are available.

Marpell Superior Products Co. has introduced streamlined gas model wheels with many new and patented improvements. The wheels are available in 4 1/2" diameter, weighing 4 ozs. per pair, or in the 3 1/2" size weighing 3 ozs.

The patented features include "Wear-

Even" tread, which is to prevent "ground loops." It also assures a constant streamlined shape regardless of the pressure maintained within the tire. The wheels have full diameter pneumatic cushions, duralumin hubs, and bronze bearings. The tires are ebony-finished rubber of .072 inch wall thickness, with flush "air-check" inflation valves that hold full pressure.

—NICK LIMBER

(Readers desiring further information on any of the items described in this department are invited to write direct to FLYING ACES Magazine, mentioning the items in which they are interested and the names of the manufacturers. And companies adding new goods to their line are also invited to notify Mr. Limber, who will be glad to describe the products. Send him full facts in care of this magazine.)

News of the Modelers

(Continued from page 49)

liam Beck, Jack Conine, George Long.

News Flash committee and editorial board: Raymond Landis, editor; Walter Moon and Leonard Gutekunst, humor; William Beck, contest notes; William S. Berry, Jr., advisory articles; Benjamin Maecheck, art. Program committee: Richard Kehrer and Norman Conway. Advisory directors: Walter S. Berry, Jr., and Joseph Kapral. Financial secretary, Louis Isern. Treasurer, Walter Hurlman. Club secretary and F. A. reporter, William P. Beck.

EASTERN STATES MEET SUCCESSFUL
RATED as one of the finest model meets ever held and attended by several thousand spectators, the Eastern States Gas Model Airplane Championship Contest was staged at Sever-Sky Field by the Metropolitan Model League of New York City on Sunday, April 24. Approximately two hundred contestants participated.

Edmund Seegmuller, 18, of the Bronx, N.Y., won the handsome Polk Trophy for his ship's duration flight of 3 min. 37 sec. Other winners in the large duration event were Magnus Anderson, Morris Shepard, and Stanley Humphries. Humphries received the Flying Aces Trophy.

Harold Spates, of Baltimore, Md., won the midjet duration event. He was followed by Frank Ehling and Gilbert Sherman, Roger Hammer's Taylorcraft received first place in the large scale model event. Other scale winners were H. Jambo, Thomas Hintze, and Walter Bobkiewicz. Subscriptions to FLYING ACES were won by Gilbert Rosenzweig, Joe Boodley, and William Scherer.

Irwin S. Polk was Contest Director. He was assisted by Walt Grubbs, Junior N.A.A. executive, Lieut. Jack Scherer,

of the National Aero Reserve, Avrum Zier, Philip Zecchitella, Walter Hurlman, William Berry, Philip Shays, Prof. T. N. de Bobrovsky, H. Eustas Ackley, and Michael Poitras.

STATEN ISLAND WINNERS

WINNERS in the recent First Annual Gas Model Meet sponsored by the Richmond Model Flying Club of Staten Island, N. Y., were: Duration event—Magnus Anderson (Staten Island), Connbert Benneck (Philadelphia), and Bernard Aurand (Philadelphia). In the payload event, Anderson and William Mott (Staten Island) and Bob DeAngelis (Trenton, N. J.) came out respectively as first, second, and third place victors.

Julius Levine (Bronx, N. Y.) won the stunt contest when his illuminated ship towed a banner at night. And Martin Rohner (Staten Island) won a silver trophy for the design, construction, and finish of his plane.

Prizes included Brown Jr. motors, Gwin motor kits, Ohlsson airwheels, and a Buccaneer Standard kit.

At a later meet held by the Richmond outfit, Joseph Regan, of Staten Island, won the duration event for 20 sec. motor run with a flight of 2 min. 53 sec.

"GULFHAWK" CONTEST WINNERS

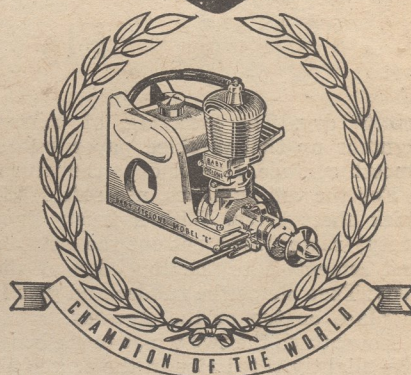
FOR the excellence of their scale models of Major Al Williams' Grumann *Gulfhawk*, Charles Bleitner, 23, of St. Louis, Mo., William Sharp, 17, of Avalon, Pa., and Michael Jugan, 13, of Duquesne, Pa., were recently awarded fifty dollars each as first prize winners in the respective classes of open, senior, and junior entries.

The prizes were awarded following

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☐ HARDWOOD
PROPELLER \$1.50

☐ COMBINATION "Champ"
Kit, propeller and engine \$17.85

☐ COMBINATION "Chief"
Kit, propeller and engine \$15.75

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the finals of the Scripps-Howard Gulfhawk Junior Aviator Scale Model Contest. Major Williams was a judge. National in scope and with 300 models entered, the contest also received entries from Canada, Norway, and Germany.

Second prize winners were Frank Hoffer, 22, of Cleveland; John Reye, 17, also of Cleveland; and Milton Hosman, 13, of Denver, Col. Third place awards were made to Richard Jennings, 21, of San Francisco; Robert Dittmer, 17, of

Denver; and Bobby Martin, 13, of Cleveland.

Major Williams declared that the job of determining the winners was the toughest he has ever undertaken. "And that's saying something!" he added.

All Questions Answered

(Continued from page 24)

gined passenger-carrying flying boat using a monoplane wing. It was fitted first with Bristol, then with Fiat and Curtiss Conqueror engines. But it was never a real success owing to the difficulty encountered in cooling the rear tandem engines. It had a top speed of 130 m.p.h., and it made a trip across the ocean to the United States.

William C. Tuxbury, Marblehead, Mass.:—It is not necessary for a biplane to carry ailerons on all four wing-tips. While every plane must have a certain proportion of aileron surface, it does not matter whether it is divided into two panels or four.

Hugh Davidson, Philadelphia:—A complete article on microfilm was given in our April issue. I am sure that will cover all your questions.

Allen Boles, Sylvan Lake, Alberta:—Canada has 190 first-line aircraft in its military service, plus about 400 others.

Bob Herzog, Burbank, Calif.:—Propellers on most war-time (British and American) planes turned in an anti-clockwise direction. The top speed of the Ryan S-T with Menasco B-4 is 140 m.p.h. With the Menasco C-4 it's 150

m.p.h., and with the Menasco C-4-S 160. Von Richthofen flew the Fokker Triplane, not the Albatros Triplane. Major James McCudden of No. 56 Squadron, R.F.C., was the most noted S.E.5 pilot. He is credited with 58 victories. And his squadron, which used S.E.5's for the greater part of their time on the front, destroyed more than 400 enemy planes.

V. P., St. Louis, Mo.:—Yes, we are always interested in new and unusual models for our readers. But at the present time we are pretty well filled up on model material, so hold on to it for a time.

Dana Cunningham, Old Town, Maine:—The Berliner-Joyce Aircraft Company is now part of the General Aviation Corporation which has its headquarters at 1775 Broadway, New York City.

Reese Isaac, Jr., Monongahela, Pa.:—The space required by an Autogiro for a landing depends on wind conditions, the type of runway, and the like. Yes, they do land with a remarkably short run, but no figures could be given without reference to the elements named above. I do know, however, that an Autogiro was recently flown indoors by a

woman in Germany! This stunt was pulled off in a large auditorium.

D. Pugh, Queensland, Australia:—The Chinese Air Force at present is using a few American Curtiss Hawks, a few revamped airliners of doubtful vintage as bombers, and, we hear, a number of Russian Rata fighters something like the Boeing P-26a's. The Supermarine Spitfire is believed to be the fastest single-seater in the world, but it is not a service ship as yet. The Hurricane, as you probably know, has done well over 400 m.p.h. Great Britain has no four-engined bombers of our "Flying Fortress" type, because their particular requirements as yet do not justify their use. The Italian Fiat C.R.32 fighter is a single-seat biplane with a 550 h.p. Fiat motor. It carries two Vickers guns and has a top speed of 242 m.p.h. I think the Hawker Demon is one of the best all-around two-seaters in the world.

Arnold Snyder, Billings, Mont.:—We have no official figures on the Boeing Flying Fortress, but it is supposed to have a top speed of 240 m.p.h. No, you cannot become an Army officer pilot unless you have two years of a college education, or its equivalent.

—BY ARCH WHITEHOUSE

Fly This "Bow-Legged Sailor"

(Continued from page 46)

job to dry. The spraying, of course, tightens up the wrinkled paper into a smooth surface. Do not dope the wings.

For the tail surfaces, use soft 1/32" thick sheet balsa. With a trusty (not rusty) razor blade, cut out the elevator and cement it to the top edge of the body. Then shape the rudder and glue it in place on top of the elevator.

Now attach the two wings to the body. The slightly tilted ribs in the center allow the tips to be raised to the desired

dihedral angle. Glue and pin the wings in proper position, and insert the two small struts between the wing and the landing gear.

FLYING

FOR power, use one loop of 1/8" flat rubber. The plane is very light, and for this reason we encourage you to make your first experiments indoors. No harm will come to the *B. L. Sailor* if he was built as directed. And if he wasn't,

there is still time to correct the trouble.

Glide the model several times. Try the various adjustments made possible by warping the elevator and rudder. Then try a few take-off flights with about 50 turns in the motor. When the ship perks indoors to your satisfaction, take it outside—providing that the wind is not too strong—and let 'er ride!

And remember that a sailor enlists for four years. See how long you can keep your *Bow-Legged Sailor* in service.

Solid Jobs From Flying Model Plans

(Continued from page 50)

If this scale outline is not given, the exact measurements of the manufacturer's full-size ship can often be obtained from FLYING ACES, catalogs, or other sources, and proportionately reduced for the purposes of your model.

Such details as struts, props, landing gear, etc., can all be blocked out in this now-familiar "box" method. Of course, it occasionally happens that for the sake of space, a flying model designer may give half-size flying model plans. And in such cases, it is merely neces-

sary to trace the basic outlines direct from these drawings.

MAKING THE MODEL

AND now your plans are completed, you're all set to go ahead and carve out your solid job just as if you were prepared with printed drawings.

First, of course, trace the top view onto a nice block of soft balsa, and trim the block roughly to shape. Then trace the side view and do likewise. Finish by carefully shaping in accordance with the fuselage cross-sections taken from

the flying model bulkheads. Smooth off with fine sandpaper.

Since the wing and the tail surfaces are the most apt to be injured in a crash landing from the mantelpiece or display shelf, I often use medium-hard balsa from which to cut these parts. The same general procedure is followed as in making the fuselage: that is, the top view is traced onto the slab of balsa and the wing is cut roughly to shape. Then, using the airfoil as developed from the wing ribs, the final shaping is

only a matter of patience.

The modeler can use his own judgment as to the coloring routine. Some modelers prefer to assemble the job and then color it. This, however, is a process of decided limitation, since it interferes with the thorough sanding that is necessary between coats.

I prefer to complete the woodcarving first. Then, after securing a fine natural finish on the separate pieces by means of smooth sandpaper, I apply a coat of ordinary library paste which I work in thoroughly with my fingers. Another sanding, and the parts are ready for first coat of enamel or colored dope.

The number of additional coats needed will depend upon the handiwork of the modeler and the fineness of the balsa he has used. However, between each coat, the wood should always be sanded with smooth sandpaper until the surface gloss has been removed.

When the surface seems satisfactory, the final details—doors, numerals, insignia outlines, ailerons and tabs, and the like—are applied in ink or enamel, or with decalcomania transfers if convenient. The whole job is then assembled, care being taken that not too much cement is used—for any excess will spoil the clean appearance of all joinings—and a final coat or two of clear dope is then applied.

And now all you need do is wait until somebody offers you ten bucks for that fine solid job you've just finished—and then grab the cash before he changes his mind.

F. A. Club News

(Continued from page 27)

and introduce yourselves.

Still another F.A.C. who wants local "aeronautical" pals is Clarence Stevens, of Berwick, Pa. Clarence is a modeler from 'way back, and he's been reading F.A. for some years. They had a real thriller over his town a short time ago when a squadron of army planes from Mitchel Field, L. I., flew down to help celebrate Berwick's two hundredth anniversary. "It's a swell Air Corps we've got," says Clarence. And now if you lads in his corner of the Keystone State want to contact him, drop him a note through GHQ.

HOWARD ROPER, of Winnipeg, Canada, just completed a swell drawing of our pal Phineas Pinkham, and he sent it down in the hope that we could print it. The colors he used wouldn't come up in an engraving, unfortunately. But it's a swell job for framing since it shows the incorrigible Boontown Bam in all his freckled glory. Yep, and there's a busted prop as a background for his straw-colored thatch, too. Maybe Howard figured "Carbuncle" had been in a crackup.

We've had a heavy influx (boy! that's a good word!) of mail here at GHQ during the past few weeks. I'd like to comment on more of the letters, because many are mighty interesting. But there isn't space this trip since I took up quite a little room talking about the flying school at Randolph Field, which

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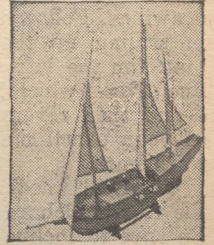
New

GIANT FLIERS

Fellows, they're absolute knockouts! Big, colorful, sleek outline scale models for long, stable flights and flat glides! For size, weight, strong construction and excellence of design, you have never seen their equal. In addition to the two shown here, there's also a WACO at \$2.00, a 60" STINSON RELIANT at \$1.50; MONOCOUE, \$1.25; TAYLOR CUB, \$1.00; FAIRCHILD RANGER, \$1.00; and AERONCA K at \$1.00. See your dealer—or any kit will be mailed for 15c additional postage.

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wasn't strictly F.A.C. news. But I wanted to be sure that all of you 60,000 members and your pals were made aware of the fact that there are vacancies for flying cadets in the Army Air Corps.

So now, all there's room for this month is the names of the skystrs who sent in the most outstanding letters and reports. Here they are:

Ross Smyth, Toronto; Paul Ryker, Phoenix, Ariz.; Newell Witte, Elmore, Ohio; Frederick Garthwaite, Hempstead, N. Y. (who wants to contact other members in his vicinity); Captain MacMillen, Riverside, Calif.; Howard Lilly, Baltimore, Md.; Jerry Chmelicek, Chicago; Bernie Murray, Denver; Charles Muth, Minneapolis; Ken Jeavons, Leeds, England; Ruth Kelly, Eas-

ton, Pa.; Bill Holroyd, Sheffield, England; Glenn Clearwater, Sheridan, Manitoba; Bert Soutar, Hamilton, Ontario, and Walter Churches, of Auckland, N. Z.

See you all next month, cloud climbers. Happy landings!

Endurance Job

(Continued from page 35)

Carve the prop from a medium-hard block measuring 1" by 1 1/2" by 11", following the details on Plate 2. Since your prop is one of the most important parts of the plane, if you're at all dubious of your ability it might be better to purchase one ready made. If you make your own, however, sand

it down carefully, finish it with 10-0 sandpaper, and give it four to six coats of banana oil with sandings between each coat.

WINGS AND TAIL

ADDITIONAL explanation is hardly needed for the wing and tail drawings. Follow the dimensions given in scaling up the plans. To get the plan for the left wing, trace the outline given—which is for the right wing—and then reverse the tracing paper so your pencil marks are next to the workbench.

Use 1/16" medium or hard balsa for the ribs, and hard stock for the spars. Be sure to incline the end ribs of the center section to allow for dihedral, which is 1½" at each tip. Cement the wing sections together *before* covering,

for the best possible results.

Tissue is used for the covering, and may be applied either with banana oil or thin cement applied to the framework and the paper carefully laid on top. It is better to cover the bottom surfaces first.

The best color scheme is one that will allow the model to be seen well either on the ground or in the air. Try, say, a color such as white, yellow, or red, on top of the wing and tail and on the body, and a color such as blue or red on the bottom of the wing and tail, and on the rudder. Some prominent red should appear on every model. And by all means put a high luster on the prop or paint it silver, for often a model may be kept in sight merely by the glint of the prop even though the rest of the model is invisible.

To assemble the model, start by cementing the elevator on top of the tail block. Do a good job here, and line it up well before the cement is dry. The rudder is then cemented as shown on the side view.

The wing is held in place with a strong band of ¼" rubber. The model is adjusted by sliding the wing, changing its incidence, and by warping the rudder. The tail should have a slight negative incidence—no more than -2 degrees. Use a good free wheeling device for the propeller.

Power the model with 10 to 14 well-lubricated strands of ⅛" flat brown rubber. Allow a few inches of slack. Use a winder, stretch the rubber, and turn in about 800 winds.

And by all means have your name and address on the model—just in case.

Clipped-Wing Clue

(Continued from page 16)

"Good practice for 'em. But what are you talking about, anyway?"

"That young war up your way. We've heard it all the way down here in the city. The radio stations are swamped with inquiries, and the Coast Guard is chasing all over the Bay."

"But I don't understand," argued Keen, putting a strained catch in his voice.

"Do you mean to tell me you haven't heard the racket that's been going on up there for the past hour or so?" Lang squealed. "Why it sounded like a tall night in Barcelona. Something must have been bombed somewhere up that way."

"I've been reading," said Keen lamely. "Have you heard anything out of the way, Barney?"

The Mick looked at him surprised, then answered in a low tone: "Are you nuts?"

"No, Barney hasn't heard a thing, either," Keen continued into the phone. "He's starting to learn to read. He's just got hold of a copy of *Black Beauty*, and there's no chance of shaking him away from it."

"Okay, wise guy. You heard it all right. And you probably know what it's all about, too. What's more, you'll hook yourself one of these days," growled Lang.

"Now we're getting somewhere. You're in a threatening attitude, and I feel better now, Lang," laughed Keen. "So let's have your story."

Lang was silent for a minute. Then he burst out with: "Do you know Booth Talbot?"

"Booth Talbot, the engineering chap? Out at Melville? Yes, I know him. As a matter of fact—"

"—As a matter of fact, you were consulted by him on a ballistics problem a short time ago," broke in Lang.

"Right! What's up? Some one swipe the thing?"

"Not yet. But they've made two tries, and Booth Talbot called us up to see what we can do about it."

"And so you called me to see what I know. Well, you have certainly drawn a blank this time. I tell you, I have

been teaching the Mick to read."

"Stop it! Stop it! That mug can read, and you know it. He can read labels on whisky bottles a block off. Anyhow, there's something screwy going on up there at Melville and I'd like you to go down there in the morning and see what you can make of it."

"And suppose I don't feel like it?"

"You'd better. If you don't I'm going to make an inquiry into why you've been in such close touch with a Swiss armament firm. Yeah. Maybe you'll tell me just what the devil you want with parts for an Oerlikon gun, Keen?"

"Oh, I use them for den decorations. I'm collecting things like that. You know me—Kerry Keen, young man about town, expert in ballistics, and 1937 champion at tossing the—"

"At tossing the bull," Lang interrupted. "But," he bawled, "you'll go up to Melville tomorrow, or I'll know the reason why. And another matter we might inquire into are those Dutch cheeses delivered to you a day or so ago. What are you doing? Going into the sandwich business?"

"We got them for mice bait," answered Keen. Then he suppressed a laugh—for he had imported them purely because he liked Dutch cheese.

Lang was quite incensed now. "Are you going up to Melville tomorrow, or not?" he snorted.

"I might—now that I think of it. I'm interested in that business—from a public spirited point of view, of course."

"Don't make me laugh. You public spirited—and buying Dutch cheeses! Why don't you buy good American cheese, if you must have cheese? Public spirited my eye! You won't do anything unless there's a bunch of money in it," stormed Lang.

"Ah, yes," said Keen. "That reminds me—just how much is there in this Talbot gun business if I uncover something?"

"Dear old public spirited Mister Keen," taunted Lang. "There's nothing in it for anyone. But Lord help you if anything happens to that business up there. If that mobile anti-aircraft unit is damaged or pinched, Mister Keen,

you're gonner wind up eating bread and water with that cheese of yours—in a Leavenworth cell."

"Good heavens!" Keen replied. "You are in a flutter, Mr. Lang. You'd better go to bed and sleep it off before you have a complete collapse. I'll drop in tomorrow and take your pulse, eh? Nighty-night!"

"You'd better drop into the Talbot Engineering test ground tomorrow first, though," barked the Secret Service man as Keen hung up.

Barney was moaning. "He's slowly catching up on us, ain't he?"

"He gets an idea now and then," admitted Keen.

OUTSIDE they could hear the tell-tale drone of aircraft engines as Naval, Coast Guard, and Army planes hummed over in a search patrol. It was evident that what Lang had said was the reason for their activity. The explosions of the parachute aerial mines had been heard for miles. And now the radio was giving out a mad cacophony of wild rumors.

Barney, still showing the effects of his concussion shock, went to bed predicting a dire end for the two of them. Keen packed a heavy briar, put a match to it, then hoisted his feet up on a table and let himself simmer off into a dark blue relapse of reflection.

But nothing he thought of clicked or fitted into position, so he finally decided to follow Barney's example and go to bed. He set the library in order—then abruptly stiffened as he sensed a door being opened somewhere. He listened for a minute, then got a gun from a desk drawer and went out into the corridor. There he snapped on a light.

Puzzled, he searched about. Then he found that the front door was open, bringing in a slight breeze that ruffled the tails of two coats that hung on a rack near a long pier mirror.

He walked quickly to the door, looked out across the wide lawn and satisfied himself that it had probably been left open carelessly by the Mick. He closed it, snapped the lock, then went back to the library and put the gun away.

"So some one's trying to swipe Talbot's new mobile anti-aircraft unit?" he said, resuming his reflections. "Well, you can't blame them. It seems to be the kind of thing they have all been looking for. But how the deuce could a spy expect to get away with a big piece of apparatus like that? He couldn't drive it through the streets. In fact, I don't see how he could get it through those concrete walls that surround the Talbot test field in the first place."

And with those problems to ponder on, he hid himself off to bed, determined, in spite of Lang's threats, to go and see for himself next day.

THE MORNING came and with it a sunshine-bathed world mellowed by the blue of the ocean which lapped the lawn beach of Graylands. Silver dew flashed from the lance points of the grass, and a soft, caressing breeze flapped at the chintz curtains of Kerry Keen's room.

He awoke, stretched, and grinned up into the sour-puss mug of Barney O'Dare who stood at his bedside with a broad tray of breakfast.

"Shove it on the table, Barney. I'll have a quick shower to get the cobwebs out of my brain and prepare for a great day."

"Begorrah, an' it *will* be a great day if you don't get that guy out of here," the Mick moaned.

"What guy? . . . Oh, you mean Buck Rogers downstairs. Don't worry, we'll take care of him. Stick a stamp on him and mail him to some worthy medical school. That's an idea, eh, Barney?" laughed Keen diving for his bath.

"I don't see anything funny about it," O'Dare muttered. "You gotter get him out of here. When ya gonna do it?"

"First thing this evening when we go looking for that flying projectile with the stub wings that we ran into last night."

"Do you mean to say you're gonner take a chance like that again tonight—with the sky full of Air Service guys all looking for something to shoot at?" boomed Barney. "Anyhow, I don't like it! I got a feelin' in me bones that something is all wrong."

"Go get yourself a drink. You're not yourself. In fact, when we get this mess cleaned up, we'll barge off on a vacation—and just sit for a while."

"That's an idea," agreed the mournful Mick.

Keen, tingling after his brisk towel-ing, slipped on a light robe and dropped into a chair before the gleaming breakfast tray. He poured himself a cup of coffee, selected a golden slab of toast, and sat back to plan his day.

But he had hardly finished his first cup of coffee when he heard the pounding footsteps of the Mick. Keen twisted in his chair, a sudden fear gripping him. Like a tidewater flood, the memory of the open door of the night before made his body tingle.

Barney barged into the room breathless.

"He's gone!" was all he could gasp.

"Who? . . . What?" Keen said, gripping the arms of the chair.

"That guy downstairs — the dead

guy!" the Mick answered, practically whispering.

"You're crazy!" the young ballistics expert said. "He was dead!"

Nevertheless, Keen slipped his feet into his slippers and hurried down the stairs, throwing inspective glances about as he made for the hidden hangar.

"We certainly put our chins out for this one," moaned Barney.

"Shut up. The man was dead. He couldn't walk away."

"No? Well, perhaps he went on roller skates."

Keen ignored the statement. "Were all these doors closed when you came down?" he asked.

"Sure, and they was. Everything was ship-shape—but even so, the ghost walked!"

Once in the hangar, Keen walked over to the corner where the body had been rolled. The piece of burlap was there in a partial bundle—but there was no trace of the man. The coverall lay on the floor near by where it had been left. Otherwise the hangar was just as they had left it.

Keen stared about unable to fathom this new mystery. "Are you sure we left him in here?" he said finally, clutching at a last hope. "We didn't take him into the cellar, did we?"

"No. We left him here—took off his coverall and then dragged him over here. Look, there's the marks through the dust and oil."

There was no argument to that. "But did you go outside last night before you went to bed?" Keen suddenly asked.

"No. But why?"

"Oh, nothing. Only, when I went upstairs, the front door was open."

"Wow!" boomed Barney. "What are we waiting for? If we move fast, we can get out and make Canada by tonight."

"What for?"

"Well, we're not going to sit here and wait for them to come and slap a big butterfly net down on us, are we? How long do you think it will take that guy to get to the authorities and spill the Griffon goulash?" demanded Barney.

"Why that man was dead! You saw that yourself."

"Sure he was dead—but he ain't here now. Some one must have come and got him."

"Wait a minute. That doesn't sound reasonable. If the man was dead, why would anyone take a wild chance like that? We searched him carefully. There was nothing on him to give him or anyone else away."

"Then the guy *wasn't* dead!" Barney said with a hollow tone.

"He couldn't have been," agreed Keen with a mystified grimace.

THEY went back upstairs to Keen's room where Barney poured himself a cup of coffee, spiked it with a stiff shot of cognac, and drank it off at a gulp.

Keen sat pondering on the situation for some time. Finally he got up and said: "I'm going to look for that guy. You stay tight—and I don't mean 'get' tight—here. And give this place a thorough inspection. That guy planted him-

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self on us in some way, using the 'death' gag to get inside. Above all, go over that ship downstairs and make sure he didn't slip one over. He broke in here for some reason, you know."

"But where are you going?"

"To the Talbot place. I'm going to see if there's any connection."

Barney winced. "And leave me here to get picked up, eh?" Then he shrugged his shoulders disconsolately. "Well, drop around now and then and bring me a pack of cigarettes, will you?"

"Take it easy. There's nothing much to worry about—yet."

"Not much—only a dead guy who gets up and walks out on us!"

Keen dressed for the Talbot visit carefully and with silent reflection. He put on a neat worsted suit, a gay necktie, and a lightweight felt hat. He was not quite sure he'd be back—for anything might happen. But he hoped.

Barney had the Dusenbergs ready when he got downstairs, and without further reference to the events of the night before, Keen slipped behind the wheel, let in the clutch, and crunched down the curved driveway. He whistled quietly to himself as he let in the high gear and whisked into the main road for Amaganset. From there on the Dusenbergs hummed at an even sixty through Southampton, Hampton Bays, and Riverhead. Shortly thereafter, he was being passed through the heavy metal gates of the Talbot Manufacturing Company's experimental grounds.

He found Booth Talbot in his office, amid a maze of drafting boards, blueprints, and wooden patterns. He was greeted with sincere enthusiasm, and it was not for some time that Keen sensed the tense spirit that pervaded the place.

Booth Talbot was a tall, stoop-shouldered man of indeterminate age. He had a youthful but somewhat weary face, a mop of healthy hair, and deep-set eyes.

"What's up?" asked Keen when they were alone.

"What's up?" echoed Talbot. "I—I'm not quite sure. But I'm worried in a way. Why, have you heard about it?"

"Yes. This chap Lang, the Secret Service bloke, says you're worried about some one trying to swipe the business."

"Well, I called on Lang because the Government has practically taken the thing, and I don't want anything to slip up now. Various strange things have happened. That sky mess that occurred last night may have had some bearing on this case. And now come along. I want to show you something."

Talbot led the way through two small offices and into a well-lighted shop. In the center of the floor stood something that looked like a cross between a modern tank and a mobile anti-aircraft truck. It had a six-wheel tractor drive, with the front wheels fitted to perform the functions of steering. On each side were two long metal legs that could be swung out on pivots and planted down on the ground to provide a suitable base for the gun carriage. Above the two arms were stream-lined boxes from which portable microphonic devices could be carried for a certain distance from the main section of the truck.

Keen had had these latter units explained to him before. They were important parts of the range-finding equipment which enabled the operators to get a triangulation check on the target. Their findings were automatically transferred over an electric cable to the master range-finder in the armored portion of the car.

Nothing quite like this had been devised before, and Keen had recognized early that Talbot had a weapon far ahead of anything of its kind. He had seen it in action against test craft, and had watched the automatic range-finder select a shell, set the nose fuse and aim the gun. Radio checks from the planes flying above had assured Talbot and the Government men who had observed it in action that these range-finders were startlingly accurate.

"This is what worries us," Talbot went on to explain when they were out of earshot of the mechanics nearby. "Notice at the upper corners of the gun turret sides—those two holes about two inches in diameter."

Keen looked carefully and nodded.

"Well, they worry us. They do not belong there, and no one seems to know how they got there."

"You mean some one drilled them in?" asked Keen, puzzled.

"Absolutely. And, as I say, they do not belong there, because the gun turret is supposed to be gas-proof."

"But outside of that, these holes do not damage the turret to any extent?"

"No, not in the least. That's what we can't make out."

"Um," mused Keen. "And now when are you continuing your tests?"

"Tonight. We want to see how it works out under night conditions. We also hope to simulate active service conditions with a smoke screen on the ground."

"I get it. And now when do you plan to commence operations?"

"I'd say about 11 o'clock."

"Do me a favor and make it exactly 11 o'clock, will you?" asked Keen in a toneless voice. "I might be around to see what happens."

"All right. And by the way, just what do you make out of that aerial torpedo business last night?"

"Well, between you and me, I do think you're the cause of it all," Keen said without taking his eyes off the gun device.

Talbot let out a low whistle: "You mean they were after this device of mine?"

"You can't tell. If I were you, I'd have some real ammunition handy—high explosive stuff suitable for long range work. Yes, you can't tell. You might get a chance to use this gadget of yours."

"I don't quite understand," Talbot said, his eyes drawn to slits. "What do you really know about all this business, Keen?"

"I only wish I knew half as much as Lang thinks I do," said Keen in a tone that gave Talbot the impression he was talking to himself.

"But what was that bombing business?"

"I don't know," Keen replied in a studied monotone.

A FEW mechanics now came up to the mobile anti-aircraft unit and began work on several adjustments, whereupon Talbot drew Keen away, saying: "Let's go back to the office. I want to talk to you about tonight. You've got something up your sleeve."

Keen smiled, wagged his head, and followed the inventor. His mind was a chaos of clashing ideas.

He was just following Talbot into the engineering office when a door opened on the other side and a man came through, striding with an aggressive tread, looking neither right nor left. He was fairly tall and good-looking. Neatly dressed, he carried himself with the air of a man who knew what he was doing.

But Keen saw none of this. He saw only the man's face—and that was enough!

With a quick move he slipped past Talbot and took cover behind the wall.

"What's up?" Talbot asked, somewhat startled.

"That man—going through the other office. Who is he?" Keen asked in a whisper. "No—don't call him. Just tell me who he is."

"That fellow who just passed through? Why, that's Storrow—Eric Storrow, our pilot," Talbot explained. "Why? What's up?"

"Well," answered Keen, "I'd like you to take me inside your office and tell me more about him. I seem to have—to have seen him somewhere before."

Once they were seated beside Talbot's desk, the inventor quickly drew out a drawer and produced a bottle and a tumbler.

"Here," he said, "you'd better have a drink. You look like a man who has seen a ghost."

"Maybe I have," said Keen. And he had to force his smile as he poured himself a drink—for not twelve hours before Eric Storrow had been lying "dead" in his secret hangar.

"Storrow," went on Talbot, "is the man who has been flying a Seversky P-35 for us during the tests of my device. We got permission from the Army to use a P-35 to simulate modern maneuvers of an enemy plane in the air. It has speed and ceiling, and carries a two-way radio. Thus it fits our requirements to a 'T.'"

"I see," nodded Keen. "But who is this fellow?"

"He came to us through a contact we made with Colonel Tudorn, late of the Ordnance Department. I have an idea he's some relation to the Colonel."

"Colonel Tudorn? Why, I didn't know he was in the United States," answered Keen. "Wasn't he transferred to one of the Pacific outposts?"

"Colonel Tudorn? Why no. I met him some time ago in New York. I was conferring with him on the gun. Under cover stuff, you know."

"I should say it was," snapped Keen. "I think you've been sucked into something. And I'll bet you all the silkworms in Japan that Colonel Tudorn isn't within 3,000 miles of New York. I'm certain he was transferred for a two-year stretch out in the Philippines, or somewhere like that."

"My heavens! Then who the devil was I was talking to?"

"I don't know. But you certainly ought to check it up. How did you contact this 'Colonel Tudorn'?"

"He contacted me. I got the impression he was under War Department orders. Anyhow, I never questioned the matter when he showed me his credentials."

"Has he ever been here when you staged any official tests?"

"No. He said he was the man behind the scenes for the Government. I just presumed he knew what he was doing and let it go at that."

"And he suggested this Eric Storrow?"

"Yes. And Storrow's a good man, too. Knows what it's all about and has made several worthy suggestions."

"Does he know anything about the gun and the range-finding mechanism?"

"No. That is, he's never been informed of the triangulation system we use. Remember, he's just a pilot who flies that plane for us in these experiments."

"Well, keep him that way. And don't say anything to him until I give you the word. In the meantime, if it's Okay with you, I'll check this 'Colonel Tudorn.' He certainly is a phoney. And I'll buzz off now. Meanwhile, you go out and keep Storrow out of the way while I'm driving out. I don't want him to see me here."

"You're acting awfully queer about all this, you know, Keen."

"Queer? Doesn't this whole thing seem queer to you? You fall for a Colonel Tudorn who isn't even in this country, you hire a pilot you know nothing about, and some one goes and drills holes in your gas-proof baby-carriage—and you think I'm acting queer!"

As Talbot wagged his head confusedly, Keen got up, reached for his walking stick, and gave Talbot a knowing glance. "Anyhow, you'll stage this night test as near 11 o'clock as you can, eh?"

"Just as you say. I'll go out and give Storrow his orders now. And will you be here tonight?"

"I might. But don't forget to have that live ammunition handy—just in case."

"We've plenty. But I don't see—"

"Neither do I—yet. But a lot of things can happen between now and midnight. In any event, I'd like to see that thing ready for real action. Understand?"

Talbot didn't. But he nodded just the same.

KERRY KEEN burned up the roads between Melville and New York City once he got into the clear. He made straight for the Battery, then took a ferry across to Governors Island and hurried into the office of the Corps Area Intelligence Officer.

Major Montrose gave him a warm welcome. And in twenty minutes Keen had satisfied himself that Colonel Albert Tudorn definitely was in the Philippines and had been there for the past two years. The information he was then able to give Major Montrose was enough to set the military dragnet for

the man who was masquerading as Colonel Tudorn.

Keen was thanked and offered the assistance of the Intelligence Department should he feel the situation required it.

"I'll let you know in the morning," smiled the young ballistics expert. "The old gentleman may pull in too long a length of rope and save us all a lot of trouble."

Keen left with a grin. But he was still worried. Events were moving a trifle too fast for him now, and he sensed that he would have to step fast to keep up with them.

He hurried uptown, sauntered into Lang's office, and found that worthy in close conference with John Scott, district head of the F.B.I. Lang greeted him with his usual sneer and pointed to a disreputable club chair.

Keen sat down and took one of Scott's cigars from a desk humidor before he spoke.

"Well," he opened, "I've been up to Talbot's place."

"So?" Lang queried with another sniff.

"Well," came the reply, "some one's going to swipe that thing—unless they screw it down."

"Yeah? If they do, you'd better head for parts north—very north."

"Don't worry, I will," laughed Keen.

"What's the answer?"

"They have a lad there named Storrow—Eric Storrow—who might be the Ethiopian in the kindling. Anyhow, I don't like him."

Both Lang and Scott exchanged glances.

"No?" prodded Lang, "What's wrong with him?"

"He doesn't tick right. He got in there on the say-so of some phony who claimed to be a colonel in the Ordnance Department who actually is in the Philippines."

"Whew!" Scott broke in. "What are we waiting for? Why not pinch Storrow now before he does any damage?"

Keen laughed: "Just like a copper," he said. "Pinch him—and what have you got? Just a phony pilot!"

"Pilot?"

"Sure. He's flying the plane on which they make their experimental range-finding tests. But you'd better not pinch him, yet."

"Why not—before he swipes the anti-aircraft thing?"

"Swipe it? How can he? He can't get it out of the place unless he can throw it over a concrete wall ten feet high. I don't see how—" But Keen suddenly stopped as a new idea crashed into his mind.

"Go on. Keep talking, Keen," Lang said with a curled lip.

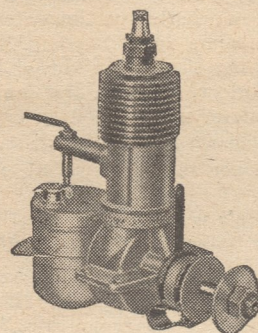
"No, don't pinch him. Let's see what he tries to do. Maybe we can catch him red-handed," Keen said. But his thoughts were now wandering—wandering to those holes drilled in the turret of the anti-aircraft unit.

"Wait until he swipes it—and then try to get it back, eh? That's a smart idea," Lang growled sarcastically. "But, Keen, you just hesitated—meaning some idea has 'struck' you. And I'd



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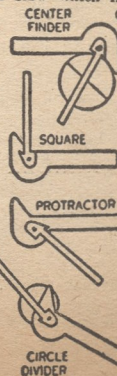
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give five bucks to know what you're thinking about."

"So would Mr. Storrow."

"But what are you going to do about it?" pressed Lang. "Talbot just called up. He's just about nuts now. You sure left him dangling in the air. And they're testing again tonight."

"Yes. You'd better be there, too. You might see some fun."

"Something like last night, eh?"

"Even better, I figure. But leave Mr. Storrow alone until I tell you to clip him," said Keen rising to go.

"Oh, so you're telling us what to do now?"

"You don't want anything to happen to that anti-aircraft unit, do you?"

"No. But if anything does, you and that Mick of yours will go into the jug—and it won't be no cream jug," Lang spluttered. "Besides, we might continue our little investigation on your cheese importations. You haven't talked yourself out of that one yet."

"Oh, we use it for axle grease, make

glue out of it, spread it on—"

"Yeah, and you sure spread it on thick!" growled Lang. But Keen had already gone out of the door.

* * * *

EFFICIENCY—stark efficiency—was reflected in that cabin, which was built of glass, gleaming dural, and polished wood. Banks of dials were fitted into the V-shaped depression at one end, and the floor was neatly covered with gray battleship linoleum.

At the aft end, a polished wood table had been let down from a section of the dural wall and four men sat at lightweight swivel chairs that swung out from the lower portion of the wall. Slightly forward, a man stood at a large hand-spoked wheel, his eyes glued to three small dials mounted on a hinged panel.

A low tremor of even vibration purred through the structure, and the man at the wheel cast glances across the cabin at intervals at another man who stood before a gleaming binnacle.

Through the wide windows, nothing but a steely-blue haze could be seen, except when the moon broke through and cast a tell-tale shadow of long, pointed proportions.

Colonel Anton Tubuloff, wearing semi-dress uniform, decorations, and a Death Head Hussars tunic, sat in a hunched position at the far end of the table. A giant of a man, he appeared to have no eyebrows or eyelashes and there was a bluish-red rim to the edges of his eyelids. Still, he was a distinguished figure for all that, and the other three sat in rapt attention and listened carefully to everything that he said.

"So far," Tubuloff went on, after giving the bank of instruments a quick glance, "everything is working out splendidly."

"Then Storrow was able to fool this devil Keen?" asked Hans Berger, who wore the blue jacket of a German Naval commander. He was a small, chunky man who made strange nervous gestures at the end of every sentence. Beady-eyed and shifty, he provided a marked contrast to Tubuloff.

"He got down safely, as Janckert reported, from the lowered observation car."

"Yes, Keen must have found him when he landed after firing on Janckert and Wolff in the car," added the extremely thin Kolbein, who wore a captain's insignia braid on the sleeve.

"That was it. Somehow those swine escaped the air-mine barrage we put down and then found Storrow. As you know, Storrow had a small charge of—well, of that stuff we all carry in our special masks for use in case we make a mistake. It was well diluted, of course, and only gave him the appearance of death."

"Gott! That Storrow is a brave one!" the bland-faced Nils Blaut added as Tubuloff glanced up at the dials again. "That required more courage than anyone aboard this ship has."

"You speak for yourself, Blaut," snarled Tubuloff over his shoulder. "We shall see, some day, perhaps. Yes, an emergency may arise when we shall see who has—and who hasn't—the bravery to sniff from the small tanks in our stratosphere helmets."

Blaut closed his eyes and drew a set of heavy fingers across the lower part of his face. "Then he got inside?" he inquired.

"His plan worked beautifully! They picked him up—and he came to in a section of the cellar and found the plane there—with wings folded."

"Why didn't he betray this man Keen?" demanded Blaut suddenly. "There are police officials in New York who would give plenty to know that man's secrets."

"Don't be a fool, Blaut!" snapped Tubuloff. "There's no necessity to betray him—yet. Of course Storrow knew that Keen had to be checked. But he had no idea how to do it. His plan of getting inside—and getting out again—was the safest. If he gave Keen away, he would have to explain *how* he came to be there and *why* he happened to be suspicious of the man who had been called in to

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protect the Talbot anti-aircraft gun. That would have been very unpleasant. And besides, Storrow has his own methods of working. In any case, I—Tubuloff—rely on him explicitly."

"You have all this straight?" asked Berger with anxious eyes.

"Perfect! Here's the message he sent to us an hour ago when he went aloft to check his plane for tonight's flight," answered Tubuloff with a gruff gesture as he shoved a thin sheet of paper across the table. "Here it is just as it was decoded."

The other three read it and appeared satisfied.

"Then they begin at 11 o'clock, eh?" said Kolbein.

"Exactly, and you had better check the equipment again, Blaut, and see that the winch is working correctly, and that the hoist gear and prong tackle is correct with the original measurements. Nothing must go wrong this time, or—or, there's nothing left for us but to turn that little valve in the back of our stratosphere helmets. We have failed twice now—and this is the third and last time."

"And you are sure this fool Keen has been taken care of?"

"So Storrow says, and he should know. He has been in the man's secret hangar—and I wouldn't like to fly any ship on which Storrow had put unfriendly hands," snapped Tubuloff.

"I'd feel better if he had made certain of Keen himself," muttered Kolbein with a glance at Blaut. "That man has too many lives for us. Storrow should have finished him off. He could have done so if he really went into Keen's house."

"Do you doubt Storrow?" screamed Tubuloff rising to his feet. "Do you question the loyalty of one member of this crew. Gott! But I will report you when we return!"

Kolbein paled and looked to Blaut to back him up. But the blandfaced one figured he had troubles of his own.

"I do not doubt the man's loyalty," protested Kolbein. "But I do question his ability to plan clearly. He has made our position insecure. All we had to do, you say, was to go down to a prearranged altitude, lower our observation car and the hoisting tackle, then Jankert slides down the fifty feet of cable and adjusts the four hooks in the drilled holes. Then the Talbot device is hoisted clear, taken aloft, and placed inside our main hold. Well, I say that all that is too much—too much to hope for."

"It has worked four times already, hasn't it?" sneered Tubuloff. "We picked up that British amphibian tank during the Cotswold maneuvers, we stole the new French cold-light searchlight at Bruay, and we stole crates containing the jigs and dies of the new Czechoslovakian machine gun from a railway platform. Indeed, only a month ago we succeeded in picking up wholesale a complete mountain battery from the test grounds of our friends on the other side of the Alps. Can we make a mistake this time?"

"The other cases were clean-cut. There were no involved side issues as these which Storrow has brought on us,"

argued Kolbein. "There are too many risks involved here."

Tubuloff sat staring at Kolbein for several seconds, and now Kolbein's face began to blanch. He put his hands behind him, forced himself up to his feet. Fear made his elbows tremble and his tongue clove to the roof of his mouth. Tubuloff was slowly drawing a large black Mauser-Astra automatic pistol from a black holster at his hip.

Kolbein watched the slow movement of the great hand as it came clear. He tried to speak as he saw Tubuloff's thumb draw the hammer back. He could hear the release bolt move forward and insert a cartridge from the 20-round magazine—and he knew his doom was sealed.

But he was game. He regained control of his frame, stood erect and faced his master.

"Herr Commander. I will return to my post. My watch begins in a few—"

But there was a sharp report and he never finished the statement.

Tubuloff put his weapon away, then gave the others a pertinent glance.

"We will descend to 3,000 meters, Helmsman, long enough to unseal the cabin and dispose of the remains of this insubordinate somewhere out to sea."

The others stood up, clicked heels, and saluted while Commander Tubuloff—who had recently preferred to be known as 'Colonel Tudorn'—stalked back toward his private chart-cabin aft.

"And remember," he thundered as he left, "every man will be on duty from 10:30 on—and every man will remain at his post until our work is completed!"

Hands went up in salute, and parched voices responded: "Aye, Commander!"

"I've been all over her. Nothing seems to have been touched," Barney said for the seventh time while Keen continued his intense inspection of the Black Bullet for evidence of sabotage by Storrow.

They had inspected king-pins, control cables, and wing-fittings. They had checked high tension leads and rollers of the distributors. They had blown out the feed lines and gone over every inch of the ship for file marks or soaped-in saw cuts.

If Storrow had damaged the ship in any way, he had certainly covered his tracks carefully.

And yet both Keen and Barney were certain that the man who had feigned death had not taken that long chance for nothing.

"The devil!" snarled Keen. "Let's go—before this thing 'gets us' and we quit cold." And he began to climb into his coverall.

Once attired for the air, they both hesitated—stared again at the Black Bullet, making a last effort to uncover the sabotage they felt sure was there. But the Black Bullet, as beautiful a bird as she was, could not tell them.

Keen got in the cockpit, then made a final adjustment on his scarlet face mask. He started the engine and with a last glance at his wrist watch gave Barney the nod. In five minutes they were out on the dark waters, thumping the pontoons on the rollers for a take-

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off. Then they cleared and climbed the Bullet carefully, their cockpit hatches open as a safety measure in case anything went wrong.

They swung back over the island at 3,000 feet, and Keen began to put her through a series of maneuvers to test her spars and controls. She responded beautifully. Yet still they were not satisfied.

"I can't figure it out," remarked Keen. "She takes everything nicely. Let's go through with it," he said with a glance back at Barney.

Then when the Mick nodded, he plugged in his head-phone jack and twisted the wave-length lever to the band that had been allotted to the Talbot firm for its anti-aircraft experiments. Almost at once he caught the carrier hum of a portable set. Then a voice came through:

" . . . and I am now at 7,000 feet approximately over Bay Shore"

"That's Storrow," Keen muttered, swinging the ship around and climbing up to 7,000.

He listened intently as he sped along, but his sub-conscious mind was still seeking the evidence of sabotage, and a strange icy feeling crept up and down his spine.

Again Storrow's voice came over the air:

"I am now at 9,000 feet . . . over Brookhaven. How do we check?"

There was a jumble of instructions from the ground. Keen hoiked the Bullet higher. And then he almost leaped from his seat—for he suddenly spied the strange clipped-wing ship of the night before streaking toward them through the haze.

"Look!" he half screamed.

Barney twisted in his cockpit and glanced forward. Sure enough there it was again. And from below its tear-drop fuselage, which carried no apparent landing gear, dangled a strange looped tackle of some kind. Moreover, the peculiar ship didn't seem to have a propeller.

Stunned with surprise, Keen let the little craft pass him, and then he curled around and followed it.

"Don't shoot—yet," he called to Barney. But his attempt to avoid a conflict went for naught. Because suddenly the flyers on the unique ship opened fire from two cabin ports and heavy slugs battered their way through the fuselage not three feet from Barney's knees.

" . . . I am being attacked by a strange plane," Keen then heard the man in the still-unsighted Seversky report. And the ballistics expert quickly guessed the reason for that message. Someone had tipped Storrow off and he was using a fake attack story to get into the action against the Black Bullet.

"Watch out for the Seversky!" Keen yelled at Barney. But the Mick did not need to listen—for he was already drawing a bead on Storrow's sleek monoplane that now came lancing down at them from above. He pressed his triggers.

But from his Brownings there only came a short screeching burst followed by a dull explosion!

"What—what happened?" bellowed Keen.

Barney stood there holding the spade grips of his beloved guns, stared out with blazing eyes and saw that both barrel muzzles had burst! He pressed the triggers again, but there was no response. The Brownings had been spiked with "fixed" ammunition.

Battered by the strange stub-winged craft and hammered by the Seversky, the Black Bullet was trapped—trapped in a leaden vise of death!

Keen sensed that something serious was wrong aft, and he slammed the Black Bullet through a mad series of maneuvers to evade the withering fire. Finally, with a wild climbing turn, he managed to whip away from the clipped-wing craft. Then he sent the Bullet straight at the Seversky which was now curling away after her dive.

"Me guns are busted!" Barney was raging.

"Just sit tight," called Keen. Then he drew a fine bead on the Seversky, noting as he did so that Storrow was jerking his stick in an effort to get his monoplane fighter clear. Keen now drew his triggers, watched four streams of fire flash across the sky.

But then there was a series of low coughing explosions that jarred the framework of the Black Bullet! Keen swore—for he knew it was all up. His own guns were out of commission now!

"The swine!" he growled as two more bursts fanged out from the clipped-wing ship which was now sweeping back on them. "Storrow slipped some heavy stuff in our ammo boxes and blew out the works. What fools we were!"

"Well, what are we waiting for?" yelled Barney. "Don't you know the way down?"

BUT KEEN had no intention of going down. He quickly glanced around at the little clipped-wing job, then curled the Bullet over on one wing-tip and roared through the sky at the Seversky. Skillfully he brought the Bullet along side Storrow's fighter and proceeded to outmaneuver him at every turn.

Gun-less though they were, Keen was playing his hand to the limit. "Come on, you rats in that flying torpedo," he yelled. "Fire at me now!"

Then the break came. The stub-winged plane slammed two heavy bursts at the Bullet just as Keen whipped up. Blinded by this move, Storrow sat petrified, fearful that the Black Bullet would sideslip into him. And it was his fear that brought his end—for as the Bullet curled over, a third burst from the clipped-wing job hammered full into the Seversky.

Keen saw that his coup had worked—saw the Seversky break in two as a jagged, flaming explosion burst its wing tanks. He heard Storrow scream his death knell into his microphone: *"Janc-kert . . . you fool . . . Oh . . . Oh . . . !"*

A tangle of dural wreckage, carrying a mourning plume of black smoke, went down to its doom somewhere beyond the shore-line of the Atlantic Ocean.

"Now what?" demanded Barney, "You can't make that guy in the flying

shell-case shoot himself down, can you?"

"I'm not worrying about him. Put your heavy underwear on. We're going upstairs—to get the Big Guy!"

And with that Keen snatched up his radio mike, flattened his tongue to disguise his voice, and began to talk:

"Hello, Talbot station . . . Calling Talbot station again . . . This is Storrow, better known as the Griffon, speaking."

Immediately he got an excited *"Go ahead"* from Talbot on the darkened field far below.

"This is Storrow—the man known as the Griffon," went on Keen. "I am trying to block a plot to steal your anti-aircraft weapon. And I want you to do just as I ask."

Getting an anxious acceptance, he carried on in his faked voice:

"Somewhere above me is an unknown dirigible. From it has been lowered a special observation car bearing three men. The plan is to lower it on down to the ground under cover of a terrific bombing display like that of last night. And unless we stop them, the men in the car will fasten a hoisting tackle through those holes drilled in the turret of your mobile A-A unit, pull it up aboard the airship, and fly it across the Atlantic. So," continued Keen, "you must obey my orders and fire when I signal."

"Yes . . . Yes . . . Go ahead, Griffon," Keen caught. *"Go ahead. We have live ammunition ready."*

"Okay. Then set your range-finders on me—for you can hear my engine, where as the airship power plants are efficiently silenced so you won't be able to range on them. You must range on me. I'll take full responsibility for the chances."

"But my heavens, man!" Talbot answered. *"You'll be shot down yourself!"*

"It's a risk I have to take," answered Keen. "You won't see me or hear me again, anyhow."

"You're insane—but game!"

"Don't argue with me," Keen ordered. And he climbed the Black Bullet madly.

For what seemed like hours he climbed. And then at 15,000 over a thick layer of clouds he finally caught up with the great lighter-than-air craft. There was no denying it now. It hung there stationary, its great silver propellers just turning over.

"Here they are," he radioed down. "They are probably trying to draw up the car, now that they know what has happened. Range me at 15,700 . . . correct your range for dirigible 100 yards to my left . . . and Fire!"

His heart in his throat, Keen then turned the Bullet in the opposite direction and gave her all she would take, praying that Talbot's gun had the accuracy claimed for it.

The slightest error would mean death for the Griffon!

Hardly a moment later, three great yolks of flame splashed out behind the racing Bullet. The bursts had come slightly below the huge dirigible, which now shook under the concussion.

"Increase range to 15,800," Keen yelled into the microphone.

BR-R-ROOM BR-R-RONG! Two more flashes near the nose of the ship.

And then there came a gargantuan roar!

A direct hit!

Searing flame blotted out everything. Keen was blinded for minutes, and he only recovered from the shock when he felt Barney leaning over him and holding the stick.

"Cease fire," Keen radioed. "Your required evidence of this plot will be somewhere near your field in a few minutes. Here she comes now. And good-night, gentlemen."

The great airship hung in mid-air for a second or two, rolled like a monster animal in its death throes, then broke in the middle. With a creaking groan, the torn colossus began her final flight—to earth!

EXACTLY ten minutes later, Keen raced up the stairs from the secret Graylands hangar and phoned Drury Lang. The Secret Service man was on the Talbot field, just as he had promised.

"That you, Lang?" Keen asked with a faked tired air. "What the devil is going on down that way? I thought I saw flames in the sky."

"Keen? Why—a—where are you—home?" came back Lang.

"Of course I'm home. But what's up over there? A Fourth of July celebration?"

"Boy, it's a good thing you're where you are tonight, Keen. I was just going to call you—to satisfy myself. I think I will anyhow to make sure where you are. So hang up."

"Thanks, I will, anyhow, I've got a grand glass of beer here that I want to get back to—and a cheese sandwich."

"Cheese, did you say?" asked Lang. "What sort of cheese?"

Zuyder Zee Zooming

(Continued from page 10)

But I will get out of this, Mine hairs. I will save the Allies, as all I have got to do is catch der Heinie what I shot down. The Krauts have made a mess, but I am der old Dutch Cleanser, haw-w-w!"

"Doomkopf! Snake in der tulip beds you iss, Myneheer Frenchy. Ve lock you oop for der soldiers to take you by der Hague undt der Hooge Raad. Gunst!"

VILLAGERS were lined up on either side of the street to see the man in the French flyer's uniform get pushed along. Buxom Dutch *vrouws* stolidly watched him pass, and being older they were unmoved by the Pinkham ogling.

Coal-scuttle bonnets were perched atop their flaxen locks or stiff muslin caps with wings at the sides. "A Chinaman sure would clean up with a laundry here," Phineas mused.

"Goot efening, Katrinka," he suddenly tossed at one *vrouw*—and she immediately threw a wooden shoe at him. It bounced off the Pinkham skull and the Yank rocked uncertainly on his undercarriage.

"Cripes," he gulped, "I'm glad they don't have iron mines here. Listen, Mine hairs, it is all a mistake. It was a Cher-man that dropped der eggs, ja! Lemme go und I vill proof it, you Rip Van Win-

Keen hung up, laughed, then reached for the wet towel Barney was holding out for him and wiped off his perspiration-streaked face.

In a moment the phone rang again, and after kicking off the rest of his flying kit, Keen answered: "Here I am, Mister Lang. Now what is it?"

"Say, Keen! You never heard anything like this in your life! We got the remains of an airship as big as a mountain here. It came down in flames—not three hundred yards from the Talbot field. They shot it down—"

"Who shot it down? And with what?" broke in Keen.

"Talbot's new gun—with the aid of the Griffon. That guy was up there directing the fire, and they got it down. And now I know you can't be the Griffon. You wouldn't take a chance like that, would you?"

"The thoughts of such a thing make me want to reach for Barney's bottle," replied Keen.

"Well, the Griffon actually had them range that A-A gun on him. He flew up close to the airship that was trying to swipe Talbot's gun, and they got it down. Why, everybody's going crazy around here!"

"Look here, Lang. Don't you think you are getting a little too old to believe stuff like that?" asked Keen innocently.

"But I tell you . . ." blubbered Lang. "Storror is the Griffon!"

"That will be all for this evening, Mister Lang. I can't waste beauty sleep on such rot as that. Good night, Mister Lang."

"Why you . . . you . . . you . . ."

"Cheese-hound," offered Keen And he hung up.

kles! Listen to me vunce—

Yankee do-o-odle vent to town—riding on der bony—Yang-g-gee doodle—Oh-h-h-h sa-a-ay c-a-a-an you se-e-e-e!

Thus he strained his vocal chords and grew red under his freckles. But to no avail. The Dutch boys who were guarding him apparently knew few of the old Yankee songs. One of them now gave Phineas a buffet on the noggin with a porcelain pipe and the Boonetown ham was sent staggering into a Dutch house, seeing stars. Immediately a big pink-cheeked *vrouw* pushed him out again. Two husky Hollanders then sat Phineas down unceremoniously and yanked off his boots. When he finally got inside the house again, he was pushed into a chair and the Dutchmen began to rattle off a lot of lingo to Dame Vanderwoof.

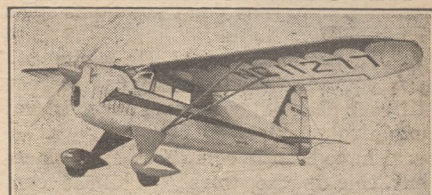
Phineas was convinced via pantomime that if he didn't stay put he would get a milk crock on the cranium. Indignantly he demanded that the Dutch get word to Major Rufus Garrity of the Ninth Pursuit Squadron at Barle-Duc. Moreover, he raged, he wanted victuals. Still volubly shouting for food, he looked around and spotted something on a window sill nearby. It looked like a succulent onion and he picked it up and took a big bite out of it. Thereupon Myneheer van Dunkemgoot made a flying

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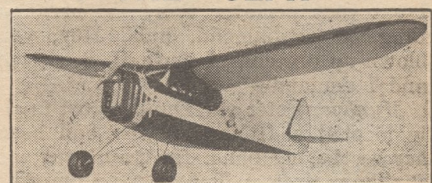
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leap at Phineas, yelling something about "four t'ousand florins."

"Well, I'm hungry!" the prisoner howled, ducking the Dutchman's tackle. "All this fuss over an onion. Huh, ya'd think—wha-a-a-a? *Tulpen?* Sounds like 'tulip' to me. Why don't you bums speak English?"

"*Ja, tulpen! Gunst!* He eadts idt! *Und idt ist* so rare like *der* day in Joon. Kill *der* peeg! Shoodt him! My most valuable tulpen!"

"I have been in some cock-eyed places, but this is the worst," Phineas complained. "It's too bad that Dutch bum ever plugged up that dike with his finger! I'm hungry—comprenny? I bet if I eat that pertater there I'll break a fang on a diamond, huh? Hey, you blown-up breeches, I am a U. S. citizen and I demand—"

Mynheer Peter van Dunkemgoot finally located a Hollander who had been across the big pond. He translated the Pinkham protest, but even so the dike builders were unanimous in the opinion that the prisoner was a liar. They instructed the interpreter to tell Phineas Pinkham that he was already as good as in the *kloosterkerk* with tulips in his hand. Yes, the Dutch intended to get hunk with the French for the bombing of their linoleum. They'd give Ludendorff a free pass to the Holland ports!

"Ohh-h-h-h!" Phineas moaned. "Look vunce, dumb heads. I am no Frog. If you want more proof, listen with both ears—"

Suwe-e-e-t Ad-del-line—myy-y-y Ad-del-line—

Dame Vanderwoof took a swipe at Phineas with her broom, and Garrity's pain in the neck subsided to think things out. What little chance he had had of convincing the tulip growers that he was innocent had gone with that bulb that had been worth plenty of sugar even in the coin of the windmill country. But after awhile he permitted himself a snicker as he eyed *Mynheer* Vanderwoof who sat near the stove holding a pistol as big as a cow's hind leg. The Dutchmen always left their wooden shoes out on the front stoop when they entered a house, so Phineas was surrounded by guards in stocking feet. They silently puffed at their pipes and scowled at their prisoner through clouds of tobacco smoke.

"I got to git out an' find that blamed Hun—or four hundred and fifty thousand Hollanders'll be tossin' monkey wrenches into the Allfies' machinery," the Yank flyer said to himself. Suddenly a beam of light irradiated the Pinkham gray matter and Phineas gave a private chuckle. "Haw-w-w-w, I think I've got it—from A to Zuyder Zee. It looks like a Pinkham is never licked! Oh boys!"

MEANWHILE, several Dutch *vrouws* busied themselves with preparations for the evening meal. The sun was ducking below the horizon and the light in the Hollanders' huge communal tepee was none too good. Phineas broke into a whistle and brought his hand out of his pocket. He tossed something out onto the floor, and as he did so, he gauged the distance between his chair and the

window, all the time assaulting the ears of his captors with the shrill notes of "K-K-K-Ka-a-ty, peautiful K-K-Katy—"

Again his hand dived into his pocket and shot out again. And once more he tossed something from him in the manner of a man strewing corn to hungry cacklers.

A lull. Then suddenly Phineas rose up, let out a blood-curdling yell, and dived for the window—getting through it just a little sooner than did the leaden spittle from *Mynheer* Vanderwoof's horse pistol.

As he sped toward the canal, Phineas heard painful yowls and yelps back in the Dutchmen's house.

"Ow-w-w-w-w! *Goede Gunst! Donnervetter!* Ow-w-w-w-w-w!"

"They won't git much of a start with them tacks in their puppies," Phineas chortled. "Haw-w-w-w-w! It's an old Dutch custom, huh, their takin' off their shoes before they go into a house. Boys, I wish I had a pair of them on, though. I could run better."

There were a few Dutchmen outside the house who did have their wooden kicks on, and they clattered after Phineas across ten acres of hyacinth and tulips, not to mention three canals.

"Th-them b-bums' shoes musta—been—made from b-balsa wood," the fugitive gasped as he kept on running, his own unshod puppies protesting against the punishment that he was giving them. But then his eyes lit on a house near a big windmill and he angled toward it. On the fly he picked up a pair of the wooden sabots, covered a few more yards, then stopped long enough to shove his feet into them. They slowed him down and he grunted disdainfully: "Huh—these ain't no dancin' p-pumps." But he kept on going. Anyhow, it was faster than bare-feet travel.

TWO HOURS LATER Phineas crawled into a haystack, and he almost had to put a fold in his tongue to get it back into his mouth. There he lay, the realization of what might happen to the Allies jolting him like the kiss of a high tension wire. The Hollanders were sore at France, the Spad specialist now knew. They would invite Ludendorff and his army to Holland, and they might even toss their own army in with the goose-stepping boys.

But even though he was still close to the tribunal at the Hague, or the *Hooge Raad*, as Van Dunkemgoot had called it, the Yankee fugitive retained his self confidence. He fell asleep, only stirring at intervals to wiggle the hay out of his nostrils.

Phineas slept until dawn, then started a precarious trip across Netherland carpet. With the sun just up over the eastern rim of the world, he reconnoitred toward a small cluster of Dutch farm buildings, and he managed to get near to the farmer's house without detection.

He found a window open and looked in. Not a soul was in sight. Probably the *Mynheer* and his *vrouw* were out in the barn coaxing milk out of the moo cows, he thought; so without hesitation he wriggled over the window sill. In a small room off the kitchen the magician

from Iowa found quite an assortment of Dutch wearing scenery. Losing no time, he set about draping his gangly frame with some of the picturesque clothing.

Within ten minutes, Phineas Pinkham looked like the picture on a travel ad entitled "See Holland First." He looked at himself in a mirror and had to snicker at his reflection.

While so engaged, he thought he heard muffled sounds. In one corner of the room was a wash basin which had recently been used, and there was a big white mug with a name printed on the side. Phineas picked it up and read "*Jan Klippenklop*"—and then he heard some one coming.

Quickly he set it down and looked around for a place to duck. But a door opened fast, and there stood a very round-faced, pink-cheeked *vrouw* wearing one of those fancy Dutch bonnets "Gunst!" she gulped. "Vot iss?"

"Wh—er—goot mornin', mawn petet—er—" the resourceful Pinkham tongue began to waggle. "I haff lost *der* vay to Amsterdam—" His spine curled up when the *vrouw* quickly pushed a flaxen curl back under her bonnet. "You liff alone by yooself, *ja?*" Phineas queried. Meanwhile he was noting the wooden shoes on the *vrouw's* feet.

"*Ja. Oudt mit you!*" the *vrouw* said, and she pointed toward the door.

"You liff alone, *hein?*" Phineas clipped. "Haw-w-w-w! Then maybe you tell me who iss it shaved here this A.M.? Maybe you was whippin' up frostin' for a cake in that shavin' mug, huh? An' wearin' shoes in the house! Tsk! Tsk! You are a faker, you Boche bum! You come here to— Oh, yeah?"

Phineas quickly drew a bead with an ugly looking automatic before the spurious Holland dame could level a wicked looking Luger. "Drop it, *mein Freund. Leutnant Pingham* has everything under control, haw-w-w!"

"*Gott!*" the Kraut snapped. "*Donnervetter!*"

"Toss the cannon right over here, dearie," Phineas grinned. "Or I'll put a hole in your camisole."

The Heinie obeyed. Phineas snatched up the Luger and dropped his own weapon. It bounced when it hit the floor.

"*Himmel!*" yelled the Kraut. "*Donner und Blitzen! Der gun ist—*"

"You catch on fast," Phineas tossed back. "Yeah, Ajax Hard Rubber Novelty Company, Inc., Logansport, Indiana, postage prepaid. I had it concealed inside my trouser leg, and them Dutchmen never found it. And now *Vorwärts!* Outside vunce, as ve must go to see the *Mynheers* in Leerdam where you will tell all. Haw-w-w-w! You kept your Boche monkey suit on under them Dutch drapes to fill yourself oudt, I bet. Step closer an' lift the hem of your skirt, Hilda."

"*Ach du lieber,*" the Kraut moaned. "*Und in ein, zwei* hours I vas goink down *der* Rhine to Chermany in *der* pakschuyt yedt."

"That must be Dutch for canoe," Phineas ventured. "Haw-w-w, well there's so many slips between the shavin' cup and the tulip—get it? Haw-w-w-w! C'mon, *mach snell*, you Boche Brinker. Alley Veet!"

NOW under an apple tree outside the place was a milk wagon—a two wheeled cart with a sleepy dobbie hitched to it. Phineas grinned broadly. "Fritz, I have got to hand it to ya, as you had it figured out as good as I would have. Get into the go-cart! Oopsy daisy, or I'll fracture your dome! Why," he added as he got in himself, "you even put cheeses in the wagon for lunch. Haw-w-w-w!"

So along the road that wound toward Leerdam rolled the Dutch milk wagon. And the only incident en route was when the Heinie prisoner of the Yankee fugitive made an attempt to break away, whereupon the Boonetown, Iowa, Houdini had massaged him with a tin milk can cover.

At high noon the citizens of the Holland burg of Leerdam, out of which Phineas had made a hurried exit the night before, stared at the wagon that drew to a stop in front of the Vanderwoof mansion.

"Any milk tooday?" Phineas yipped when *Mynheer* Vanderwoof emerged. "Right from coontended coos, ja! Haw-w-w-w!"

"Goede Gunst!" yelled the Hollander when Phineas took off his Dutch skimmer. "Holy St. Bavin! *Der* Frenchy! *Donnervetter!* Coom, efer'pody—!"

"Keep your rompers on," Phineas sniffed as he yanked the Heinie off the wagon. "Take ein look, as it is not Hans Brinker goin' to a hockey game. Look at *der* Cherman uniform vooonce! This is the guy what drooped idt *der* boombs on *der tulpen* beds, mine hairs, ja!"

"Gunst! Huzza! Coom oodt and look! Coom oot, Peter van Dunkemgoot. Efer'pody!"

The Dutch came—and they were convinced when Phineas Pinkham pointed out that no Kraut would have been ashamed of his Berlin tailoring if he had only been forced down on Dutch terrain.

"An' he was flyin' a Frog buggy, mine hairs," Lieutenant Pinkham added. "A Kraut bum wouldn't do that unless it was dirty work, ja? A-right, now I have proved my innocence and will say adoo. That is, if you have got some gas about. And maybe there's a tailor shop that cleans clothes *mit, hein?*"

Van Dunkemgoot shook his round dome, took a long puff on his pipe, and tossed out three mouthfuls of Hollander lingo at a little Dutchman who was as broad as he was long. And the translation set Phineas back on the heels of his borrowed *sabots*. It meant that he was to be interned in Holland until either the Kaiser or the Allies yelled "Uncle!"

"I demand a hearin'," Phineas yipped. "When I get back to the U. S., I will be called a deserter, an' they will shoot me. I have showed you what double-crossin' bums the Boche are an'—I—where is the mayor? Have you got a king here? Where is Wilhelmina? I will get Wilson to declare war on the Netherlands, you wait an' see!"

All Phineas could get was a promise that the Dutch boys at The Hague would send word to Ludendorff that he would get knocked for a row of windmills if he dared crush any more tulips under a Heinie boot. They might also

refuse the Heinies any more free passage on Dutch waterways for the hauling of sand and gravel. Meanwhile, though, Phineas Pinkham, wandering Yank, was to be sat on until the Big Fuss was over. So still protesting, the scion of the Pinkhams was tossed into a Dutch klink until arrangements for his removal to an internment camp could be arranged.

Once behind the bars, Major Rufus Garrity's inimitable Spad pusher slumped in a chair and started once more to think it all over. Absentmindedly he took a Dutch cheese the size of a grapefruit out of his pocket—he'd lifted it from the milk wagon—and started to scale off some of the red preservative with which it had been painted.

Then, all at once, his buck teeth came together with a loud click and his freckled map broke up into a broad grin. "A Pinkham never gives up," he declared and immediately brought out a jackknife he'd saved out of the fiasco.

For an hour he labored. And eventually he placed something on the bench beside him that looked for all the world like a Mills bomb. With dirt from the floor he stained it a drab gray, and with a nail and a key ring he soon completed the illusion.

Phineas then lapsed into a spell of watchful waiting.

TOWARD MID-AFTERNOON, the Yankee prisoner was lifted off his chair by the sound of a sky wagon's prop. He went to a window and looked out. A sluggish looking two-seater was coming down for a landing not five hundred yards away.

"It's the Dutch Air Force," he yipped. "Haw-w-w-w! I bet it is carryin' a big boy from The Hague to look at me an' the Heinie. Boys! If I could only get my Dutch rompers into that thing!"

Phineas had guessed right about the plane's cargo. A big Dutch army officer was admitted to the klink about a quarter of an hour later, and fortunately he could talk a questionable brand of English. He congratulated Phineas. But at the same time he tendered his regrets with regard to the American's status for the remainder of the Great Scrap.

"Internationaal var iss dis, *mein goede vriend, ja. Der* noodrality moost be—"

"Aw-w-w-w-rats! Aw-w-w-w cripes! I am A.W.O.L., an' I will get in a sling. I—" Phineas picked up the fake Mills grenade and held it over his head. A chorus of guttural yells and shouts canonaded from the Dutchmen. So frightened were they that they vamoosed without bothering to shut the door.

"I will toss it," Phineas yipped at them threateningly, inwardly chuckling. Thereupon, he broke jail and backstepped over the cobblestones with his wooden shoes clattering. "I am a desperate character," he called to them, "and I do not know my own strength. My granpappy ran worse gauntlets *mit der* Indians an'—shoot yoost vunce an' I blow *der* whole boonch oop!"

"Gunst!" yelled a Dutchman. "Don't shoot at him nopody. Tink of *der* voo-mans an' children! If you miss, dis madman t'rows idt *der* boomb. Holy—"

Phineas kept back-peddaling, and once

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he luckily turned half around to see a man decked out in a flying helmet kneeling down to take aim with a pistol. Quickly, the Yank wound up with the Dutch cheese like a star southpaw, and the Hollander birdman frantically tossed his hardware high into the air and tried to dig a hole for himself in the ground. Then Phineas made a nimble sprint for the idling two-seater.

A gun boomed but the bullet went wide of its mark. The next Hollander to try his luck was a little better shot, and a slug went through the billowing cloth of Phineas' borrowed pantaloons. The Boonetown patriot whirled, made as if he were about to make a long throw with his still-unhurled cheese at the group of Dutchmen who were advancing in a tight arc a few hundred feet away. At that, panic gripped them and they scorched the soles of their wooden boots getting to cover.

Pilot Pinkham was already in the two-seater when the Dutchman got organized again. A hurried gander told him that the crate he was stealing was an old Breguet.

Then just before he got the ship rolling, he straightened in the pit and finally heaved his spurious bomb.

A Dutchman took his fingers out of his ears when the plane tore across the flats. He looked at the dud rolling over the turf and advanced toward it with caution.

"Have a bite!" Phineas hollered as he lifted the wheels of the Frog two-seater off the linoleum. "Haw-w-w-w!"

"Der cheese!" Mynheer Dunkemgoot yelped, and he jumped up and down with rage. "Nodding boot der cheese yedt. Gunst! Look, Mynheers. Der cheese mit der nail und ring—he makes idt der boomb—"

"Ho! Ho!" enthused a Dutch army officer. "But I ben gladt, ja! Der Amerikan iss a smart vun, nein, Mynheers?"

"Ja! Ha! Ha! Ho! Ho! Ho!" chorussed the citizens of the Dutch town. "Ja! Efer'pody zing, ja."

And they burst forth with:
Ya-a-ankee didee dudel down,
Didee dudel lawnter,
Ya-a-ankee river, voover, vown,
Botterme-elk und Tawnter-r-r-r-r!

Meanwhile Phineas Pinkham was tooling the Frog two-seater dead southward, his eyes roving about the ozone for Boche sky wagons. Lady Luck, apparently figuring that she had been pampering the Boonetown pilot too much, suddenly gave him the works. Over Raucourt, with his gas getting lower and lower, Phineas looked up into the dusky attic and saw a couple of Fokkers diving on the nape of his neck.

Unfortunately, the Frog ship was as quick on the getaway as a turtle with gout, and when the Yank at the controls tried out the single gun that the Dutch boys had rigged on its cowl, it proved to be as empty as Mother Hubbard's pantry.

"Just my luck," Phineas wailed as Spandau lead sang a swan song all around him. "I get this far an'—well, chin up, white tie for dinner, an' carry on, ol' thing. Maybe I will be able to get downstairs yet."

OUTSIDE of Bar-le-Duc Major Rufus Garrity and his pilots had given Lieutenant Pinkham up for lost. The report had come in from Valenciennes that the miscreant had been there and had stolen a Nieuport.

The Old Man walked the floor of the Frog farmhouse which served as headquarters. "He's deserted, that fathead!" he ranted, biting the ends of his mustache and tearing hair out of his scalp in chunks. "He's A.W.O.L. Took the wrong train from Patee on purpose, I'll bet. And now where is he? Huh?"

"If I was psychic," Captain Howell grunted, "I would tell you."

"No lip outa you!" Garrity stormed. "How would you like to be busted to a spark plug cleaner? Pinkham's runnin' around, somewhere impersonating a Frog officer. The fathead'll get shot! But why should I care? Let 'im get shot! Am I worryin'? Ha! Ha! Anybody'd think I give a tinker's dam—"

"You sure do look nonchalant," Bump Gillis ventured.

"Shut up, all you wise alecks," the Old Man exploded. "Oh, if I could get my hooks on that halfwit. Stealin' a Frog plane. Impersonating an officer! He'd have the gall to walk right in here wearin' it, too. He'd—"

The Major suddenly went speechless. An automobile was rolling up to the door of the farmhouse, and two British red tabs now flung open one of the car doors and climbed out holding Phineas Pinkham between them. They brought the prodigal pilot into the Operations office and let go.

Phineas plopped into a chair, looking the worse for wear, and peeped out at the Major from between rounds of bandage. Enough of the stuff to wrap up the Cathedral of Notre Dame was wound around various sections of his anatomy.

"This blighter says he belongs here, Major," one of the red tabs spoke up. "He fell in our trenches near Beaumont, 'e jolly well did y'know. And blarst hit, Major, I think 'e's no end balmy. Says 'e was in 'Olland an' stopped Ludendorff from getting a Dutch treat. The ruddy blighter's pullin' my leg, doncha think?"

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The C. O. of the Ninth tried to find speech. But he failed. Bump Gillis pawed at his face and said: "Well, it ain't no Chinese mandarin's suit he's wearin'—"

"Strike me pink!" exclaimed the other Limey. "I got this out of 'is airplane, Major. Got me stumped no end—r'ally. Found this 'ere tulip wedged between a strut and a wire. Hit is a tulip—or I'm a bloomin' Boche!"

"Y-yeah," Major Garrity admitted reluctantly, suddenly noticing the wooden shoes on the Pinkham undercarriage. "Ah-h-h-h-h cripes! Look, Pinkham, you cock-eyed—"

"Don't lay a ha'd od me," Phineas warned him through his bandages. "I'd fall dapart. I hab been to Holla'd—I was tricked by a Frog porter id Paree—oh, if I eber see thad bumb again, I'll—lost my uniform in a tailor shob in Valenciennes. I swibed a Nieuport, as I was overdue an—I knocked down a Boche over a tulip field an—well, I have saved the Allies—get me a crack-er or somethig, as I had to throw away the cheese I had saved for subber."

"Did you stop in Switzerland to get your watch fixed, you crack-pot?" Major Rufus Garrity thundered. "Oh all the—you're a liar—but—it is a tulip! Them britches you've got on—those shoes—ah—er—excuse me, gentlemen. I would like to go up and lie down for awhile."

"Raw-w-ther!" a red tab said. "Ah—er—Garrity, if there's room for me—?"

"Haw-w-w-w-w!" Phineas burst out, biting through some adhesive tape to clear his mouth. "Goonst. What a guerre! Help me up, somebody. Hey, you, Bump! Hold my right arm awhile. Boys, I wish you could see the fat dames in the dike country. I almost got some

telephone numbers. He-e-ey, Van Go-o-omer. Tiffin, voonst. Veet! Tiffin is Dutch for supper, bums! All I have had since I left the Frogs was half a tulip bulb. Haw-w-w-w-w!"

POTSDAM quickly got a mean letter from the Dutch brain trust at The Hague. The Kaiser was informed that he'd better tell Ludendorff to equip his goose steppers with waterwings—for if he brought them into Holland all the dikes in the land of Hans Brinker were going to be blown up. The Hague also informed the Kaiser that they were holding one *Hauptmann* von Spreckelheim for the *Hooge Raad*, and that his bail had been set at a mere hundred and fifty million marks. No, the Dutchmen did not pull their punches, and Ludendorff and his staff felt them right down to their insteps.

Also, the big Heinie general got a very scathing letter from his Emperor advising him to consult a good dome specialist the next time he had a brain storm.

"Himmel!" the Boche top shot gutturalized when he heard of the flop. "Zomet'ing idt ist wrong somewhere. Idt vas foolproof, und—und vhat did der Hague said? Der intervention of der brafte Amerikaner flyer—er—Gott! Ach Himmel, Donner und Blitzen! I bedt you it vas das Pingham! Ach, der deffil he ist!"

And finally, reader, if you ever go to Boonetown, Iowa, stop in at Ike Chase's barber shop and pool room. A pair of wooden shoes hang on the wall, and Phineas Pinkham's autograph decorates the sole of each.

But maybe Ike isn't there any more. Maybe somebody has stolen the shoes. We wouldn't know.

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(Continued from page 43)

FLYING

FOR test flights it is best to avoid windy days because of the ship's light wing-loading. Glide the ship until you are satisfied with its characteristics. Start the motor—and be sure to set your timer—then watch the remark-

able speed in which the ship hops off (hence the name *Scram*.)

Good luck to you all—and I'm hoping to see a stack of *Scrams* at the Nationals next month. If you should run into any fog while building the ship, don't hesitate to write me in c/o FLYING ACES.

Build The Vultee 11GB

(Continued from page 31)

COVERING AND ASSEMBLY

COVER the fuselage, tail, and bottom surface of the wings, with silver tissue. Smooth out all wrinkles carefully. Cut out the tissue between R-2 and the false rib and glue the legs firmly in place, being careful to align them accurately. Then cover the top of the wing.

Set the wing in position under the fuselage, and glue it firmly in place. See that the lower surface is parallel to the center line. This is important. When dry, add the fillet former F (Plate 3) cut from 1/16" flat stock. Then cover the fillet with small scraps of tissue. Cut each piece to shape before adding, and cover no more than the section between any two bulkheads with a single

piece. A little care and patience is necessary here.

Next install the stabilizer, gluing it to the stringers and bulkhead No. 9, and with a small piece of tissue make the top fillet over the top stringer. Glue the rudder to the cone and lower former, and add the assembly to the stabilizer and tail post. Note that the trailing edge of the stabilizer is 1/16" above the upper stringers.

Glue the tail wheel housing in place and add the cowl. Use plenty of glue. Cut out the windshield and rear gunner's hatch from thin celluloid and set them in place. Add two 1/32" by 1/32" balsa stringers at the top corners of the superstructure bulkheads, and fill in with celluloid. Outline the windows with

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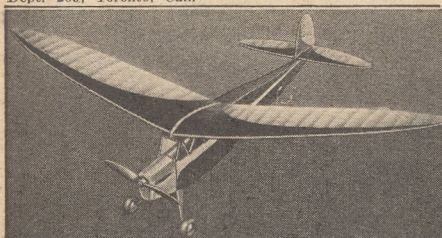
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1/16" strips of silver tissue.

Carve the propeller carefully. Make a shaft (Plate 1) from music wire. Assemble the prop, shaft, and nose plug, using three washers as a bearing. Slip the wheels in place, and secure each with a washer glued to the end of the axle. The wheel "covers" are made either from light sheet aluminum, or heavy bond paper, silvered.

For power, use two loops of 1/8" flat brown rubber. Cut a small piece of tissue from the fuselage just forward of bulkhead No. 10 and thread the motor

through the fuselage with a long music wire hook.

Balance the model by adding BB shot between the motor cylinders until it glides and flies smoothly.

If you want "more appearance," control surfaces may be outlined with India ink or black tissue strips. Russian, Chinese, Turkish, or Brazilian insignia may be bought from your dealer and pasted on—or painted, if you're artistic.

And now your Vultee V-11GB attack-bomber is finished and ready for the flying field. Good luck!

Make an "Ensign" Solid

(Continued from page 38)

that the safety factor is ample.

Here are the main specifications of the plane: Wingspan, 123 feet; length, 110 feet; height, 23 feet; mean chord of wing, 20 feet; wing area, 2,450 square feet; "all up" weight, 20 tons plus. A crew of five is carried.

And now we've given you all the available dope on the real ship, let's get down to patterning—

THE MODEL

BREEZE around to your dealer and pick out a block of soft balsa 1 1/2" by 1 1/4" by 13". Also buy some 3/4" or 5/8" sheet for the wings. Commence on the fuselage by marking out the side elevation from Plates 1 and 2 and trimming around the outline. Then trim to the top view in like manner. Before you finish shaping the hull mark and cut out the portholes. To make the tool for this operation, get a pen-holder and reverse the metal part that holds the pen nib onto the handle. Then sharpen the round end on a stone or file. The sketch on Plate 2 shows you how to use the instrument.

When you are sanding the hull keep an eye on the cross-sections on the plans. Don't forget to leave a flat fillet on which to cement the wings.

Shape the wings to the airfoils shown on Plate 3. Attach the motors and nacelles; these may be fitted best by wrapping a piece of sandpaper around the wing over the section to be covered by the nacelles, and hollow out the slots to fit the airfoil thus formed. It will then only be necessary to fillet with cement.

ENGINES AND FINISHING

DEFINE the engines by marking them in black ink on discs of paper, which are then cemented neatly in the cowl (See Plate 3). Then attach the "De-Havilland props" which may be cut from thin sheet aluminum, given a slight pitch, then cemented on the spinners.

The spinners may be made from face cream tins (as also may the props). Use the end of your penholder as if you wanted to bore a hole in the metal. However, do not push it through, but work it around until you have impressed enough to form a spinner. The whole air-screw assembly may be set up on a pin and a 1/4" length of 1/8" diam. reed.

It will be as well at this stage to do the coloring, which is aluminum. After superfine sanding, fill the grain of the

balsa with photographic paste or other filler. Sand again when dry. Give the whole plane a coat of aluminum paint, sand again, and apply another coat of paint. The plate lines and rivets may be worked in with a needle point.

For the expert builder we recommend a "silver-plate finish" such as described in Frank Zaic's Year Book for 1935-36.

After the coloring is done, cut the windows from thin celluloid and insert them. Add the radio masts, direction finder, and the British Civil Air Ensign. The wheels should be recessed at the centers for aluminum discs—then the undercarriage is cemented into the wells in the motor nacelles.

"Register" your model in black lacquer with the letters G-ADSR, paint on the Imperial Airways insignia, and you have a worthy companion for the Empire Boat which appeared in FLYING ACES for October 1937.

Good luck!

Answers

TO QUESTIONS ON PAGE 24

- 1—The Bristol Aquila engine uses the sleeve-valve system.
- 2—Yes. Their Perseus and new Hercules engines are fitted with sleeve valves.
- 3—Jacobs makes two distinct types, one of 285 h.p. and one of 225 h.p. But there are seven versions of these two.
- 4—The "Super-Buccaneer" is an inverted, in-line, six-cylinder supercharged aero engine usually used in racing machines. It is rated at 250 h.p.
- 5—At present the Ranger SGV-770, rated at 420 h.p., is the most powerful of the Ranger products.
- 6—The Wright Whirlwind Series R-1510 is a double-row radial engine.
- 7—The "Gryphon" is an eight-cylinder opposed engine which may be mounted in a ship horizontally or vertically. It is rated at 120 h.p.
- 8—As far as we know, only the Guiberson Diesel Engine company, of Dallas, Texas, makes an aero Diesel. (All their products are on the Government restricted list, so we cannot give you details of their engines.)
- 9—The Toupolev M.34 liquid-cooled, Vee-type engine rated at 950 h.p. is believed to be the most powerful of the present Soviet output.
- 10—The German Kroeber M4 and Deicke ADM7, both listed at 18 h.p., have passed license examination. These are believed to be the lowest power ratings in the world.

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