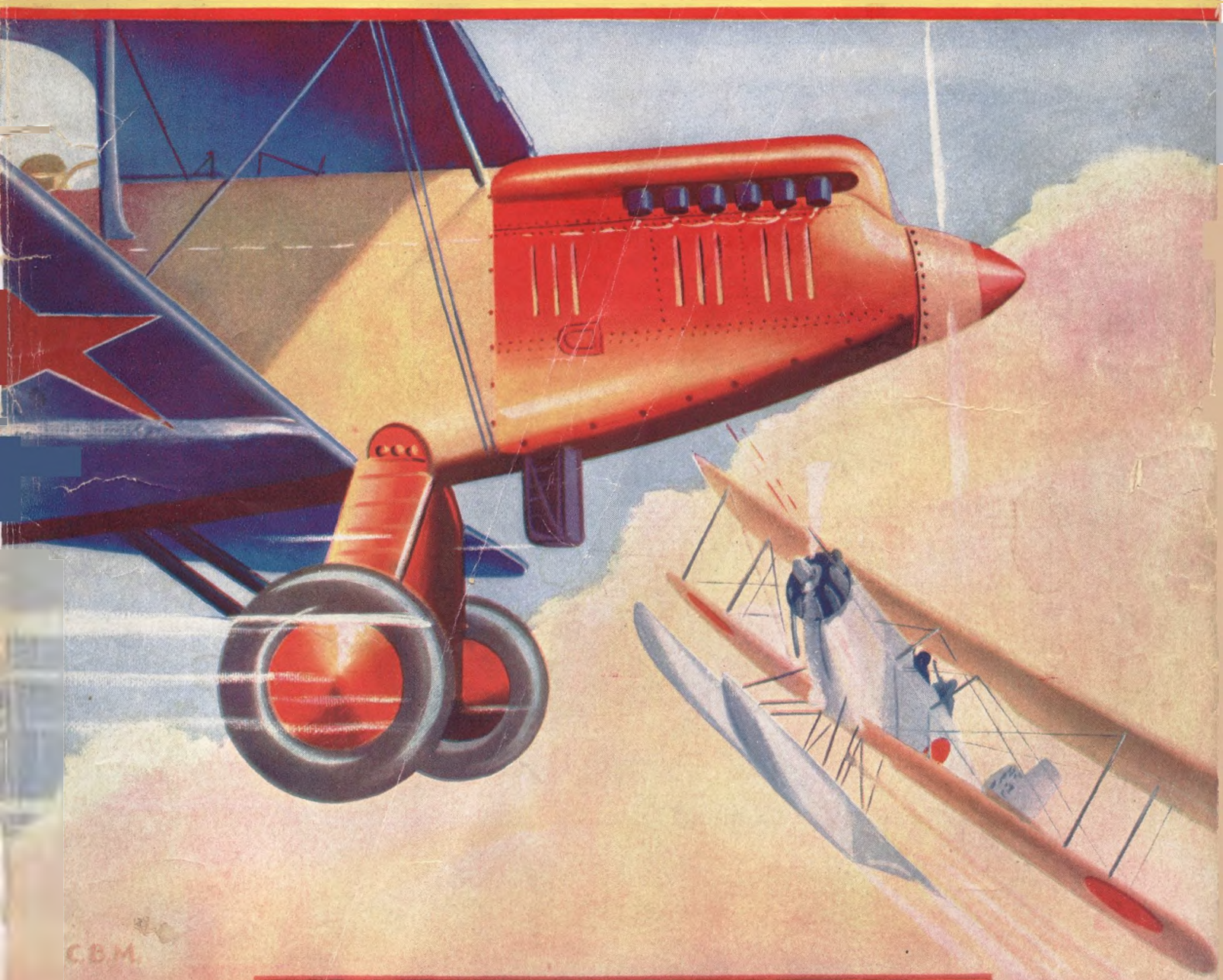


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**ALL YOUR FAVORITES—"PHILIP STRANGE," "KERRY KEEN," "PHINEAS"
ARTICLES: CAN OUR A-A GUNS DEFEND US?--RUSSIA'S AIR STRENGTH
PLANS FOR CHINA CLIPPER, VULTEE, FLYING MODEL OF HUGHES RACER**



"THE FIRST GIRL I EVER LIKED — and these Pimples had to come!"

But it wasn't too late, Ben found, to mend the trouble

I THOUGHT YOU AND THAT NICE NEW BABS GIRL NEXT DOOR WERE GOING TO BE FRIENDS — WHAT HAPPENED?



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DOES SEEM TO BE A LOT OF 'EM --- SAY, YOU KNOW MY COUSIN RAY~ HE TOOK FLEISCHMANN'S YEAST FOR HIS PIMPLES -- WIPED 'EM RIGHT OFF THE OLD PHIZ



FLEISCHMANN'S YEAST DID THAT? SAY, LEAD ME TO IT!

LATER

BABS, GO TO THE SCHOOL DANCE WITH ME NEXT SATURDAY?

WHY, I SORT OF HAD A DATE, BUT... YES, I'D LOVE TO!



GOSH, I'M GLAD I GOT RID OF THOSE PIMPLES!

Don't let adolescent pimples make YOU hide away!

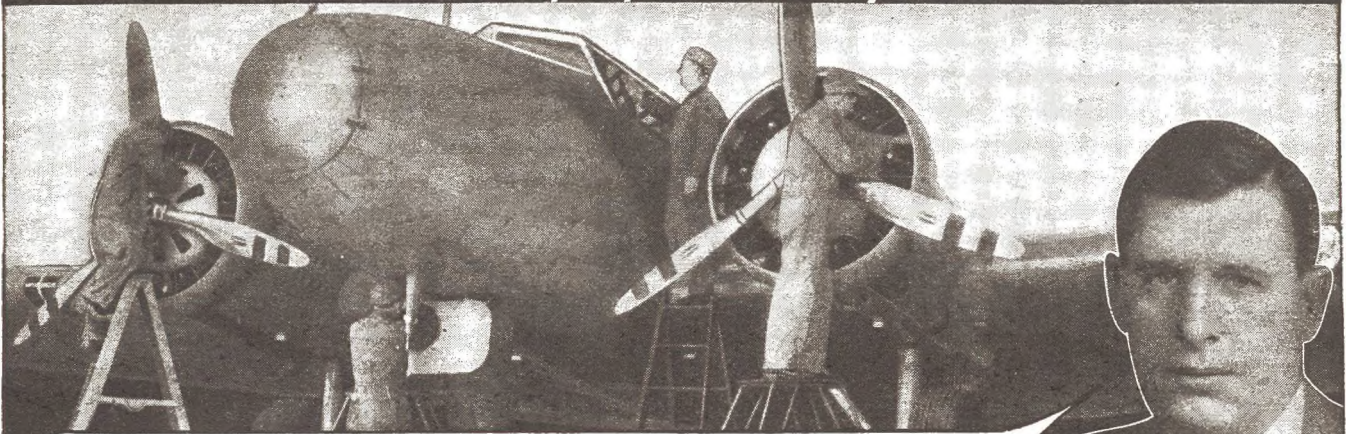
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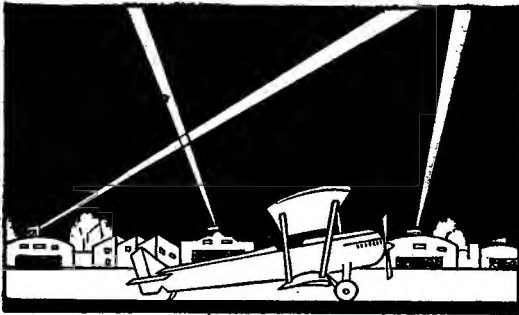
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NEXT MONTH'S FLYING ACES

FLYING ACES

A. A. WYN, Editor
VOLUME XXII

MARCH, 1936

HERB POWELL, Managing Editor
NUMBER 4

EVERY STORY COMPLETE — NO SERIALS

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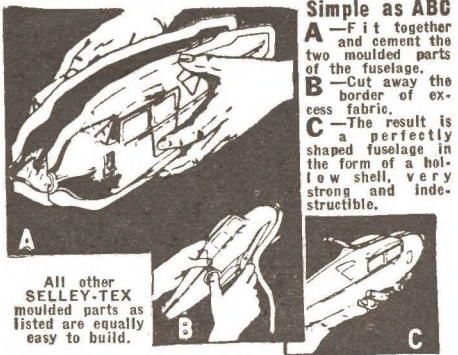


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— THEY ADVERTISE — LET'S PATRONIZE —

The Armored Corpse

CAPTAIN STRANGE FACES DEATH IN THE WHISPERING VALLEY

• • •

CHAPTER I

THE PUZZLE OF PRIVATE LITTLE

WITH a sigh, the old blind beggar lowered his violin and stood wearily waiting for the sound of the next passerby. Before him, rain glistened on the cobblestones of the dim-lit Chaumont street. The curio shop behind him was closed and dark.

A slow drizzle beat monotonously on the patched canopy under which he stood. Now and then a cold rivulet dripped onto his gray head, trickling down his forehead and over his black glasses. He was raising a threadbare sleeve to wipe away the drops when hasty footsteps sounded from his left. As the man hurried by, the beggar could hear him breathing heavily.

A moment later the footsteps ceased. If the old fiddler had not been blind he would have seen a pale, frightened face staring back under a wan street light. A small, timid figure in khaki stood there, fearfully looking over his shoulder. In a second, the frightened one turned and scurried into a little tobacco shop.

The door had hardly closed when a tall man in American olive drab came swiftly and silently around the corner. The silver bars of a captain shone on his shoulder-straps. Lifting something in one hand, he took a noiseless step toward the man under the canopy. Then he halted, hand thrust behind him, as he saw it was only a beggar.

"I'm looking for an American private," he muttered. "A small man—middle-aged—" he stopped as he saw the beggar's dark glasses.

"It ees ten years, *m'sieu*, that I see no one," the old fiddler said sadly. "But I just hear the leetle bell on Pierre's shop door. Maybe your frien' go in there."

"*Merci.*" The officer tossed a coin into the hat at the beggar's feet. He strode on, boots thudding in contrast with his stealthy approach. But the thudding steps changed to a furtive tiptoe as he neared the shop. He peered through the window, turned quickly as a car came splashing through the rain puddles. The car slowed, and the officer spoke in an undertone to the driver. As the machine rolled on, the man in olive drab crossed the street and hid himself in the shadows.

The old fiddler began a plaintive melody as two French soldiers with village girls came along the walk. They went past, laughing at some jest, ignored his quavering plea for alms. Other pedestrians passed.



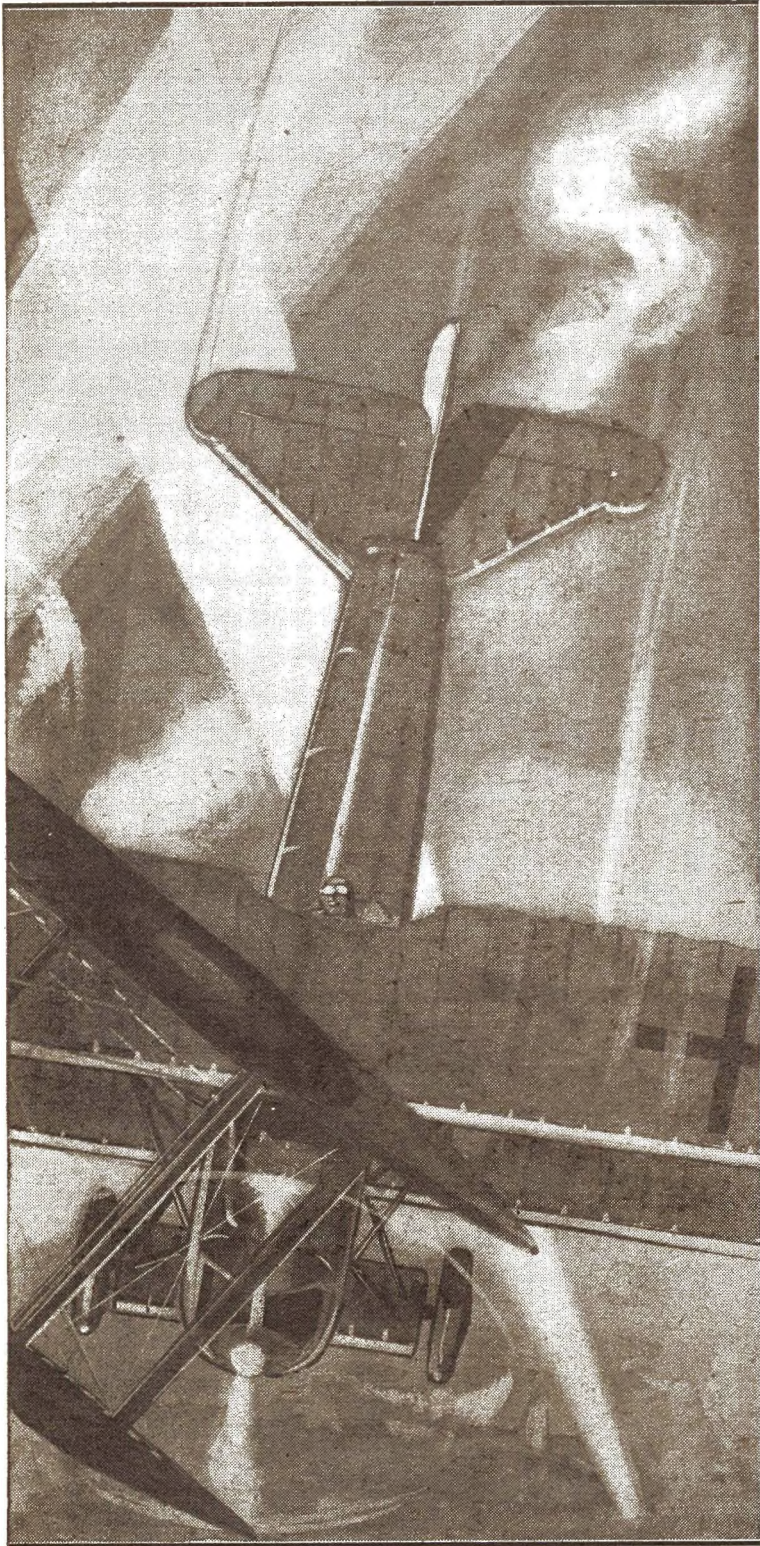
A G.H.Q. car purred importantly through the drizzle, stopped near the next corner. A minute later, two American officers appeared from the direction of A.E.F. Headquarters. The beggar had stopped playing, and the men did not see him.

"—Just twenty-four hours to spot the leak," one of the two said grimly. "I'd hate to be in Colonel Jordan's boots."

SMASHING "PHILIP STRANGE" MYSTERY

By Donald E. Keyhoe

Author of "Dromes of Hades," "Strafe of the Flying Corpse," etc.



Illustrated by E. M. Frandzen

The two remaining Fokkers charged in furiously. Strange reversed, stabbed two quick bursts at the ship on his right. The German skidded, dropped beneath him in a hasty turn.

"What's the matter with the 'Mental Marvel?'" said the other in a sneering voice. "Why doesn't the great Strange perform one of his miracles?"

The first man's reply was lost to the beggar. As the two men passed the tobacco shop, the frightened pri-

Down from the heavens that curtained G.H.Q. there plunged a shining, grotesque object. And when Captain Strange saw that fallen form he gasped—for here was the priceless, ancient armor of Maximilian and within it the broken body of an unknown wretch. But meanwhile men of the 55th were dying. Already, Adams, Armstrong, Ayles, and Baker had met the blue fate. And Burton was a raving maniac—for Burton knew his name was next on that alphabetical roster of doom!

o o o

vate hurried out and walked along behind them, keeping as close as he dared. Across the street, a figure emerged from the shadows, moved in the same direction.

THE old fiddler bent down and fumblingly placed his violin in its case. He put on his hat, tucked the case under his arm, and started along the sidewalk, groping his way with a cane.

The occupants of the G.H.Q. car had gone into a house set back of a tall hedge. As the two officers reached the spot, they also entered. The timid soldier, left alone, looked nervously over his shoulder and hastened around the corner. A menacing figure followed like a flitting shadow.

Instantly, the beggar's uncertain steps changed to a swift run. A stifled cry sounded as he passed the hedge. He put down the violin case, sprang around the corner, tugging at his cane. Through the glasses which had masked his alert eyes, he saw a grim scene.

Slumped to his knees, clawing wildly at a strangler's noose about his throat, was the Yankee soldier. The man in captain's uniform stood crouched over him, viciously tightening the garroter's cord about his victim's neck.

"This time, *Schwein*, you die!" he said in a muttered snarl.

The other's man's frenzied struggles jerked the false captain around. At sight of the beggar, the German leaped back and the half-strangled soldier fell to the ground. There was a hiss as the beggar whipped a slender sword out of the hollow cane.

"*Zum Teufel!*" rasped the spy. He plunged one hand under his blouse, snatched out a pistol. The beggar's sword moved like a streak of light. A gasping cry was wrenched from the German's lips as the sharp blade pierced his heart. He went up on his toes,

took a shuddering step backward then crumbled beside the hedge.

The beggar sprang toward the prostrate soldier, hastily loosened the cord. As he heard the man's stertorous breathing, he picked him up effortlessly and

ran with him to the empty Headquarters car. When he reached the machine, the soldier's breathing had become less labored. He placed the unconscious man in the rear, laid the violin case on the floor, and hurried back to search the dead German. He took the spy's credentials, stood up and reached for his fallen sword. He was wiping it on the wet grass when he heard some one approaching in the gloom.

Hurriedly, he sheathed the blade and started for the corner. This was no time for explanations. He quickened his pace as a shout rose from behind him. The body had been discovered. He was springing into the G.H.Q. car when across the intersection the lights of another machine went on. At the same moment a man in French sky-blue raced from the shadows where the dead spy had fallen. The beggar spun upon the running board, his sword half out of the cane.

"Ach!" the other man howled. "So it was you!"

A black automatic flipped up in his hand. In the same instant he caught sight of the unconscious soldier. The snout of the gun jerked sidewise, just as the beggar's sword swished down in an arc. There was a roar and a spurt of flame, then the pistol clattered to the ground. The man in blue reeled back, his arm dangling.

"Max—hilfe!" he cried out to some one in the other car. "Der soldat—it is Private Little!"

A gun blazed from the spies' car as it lurched across the street. The beggar threw himself down, seized the starter switch. The engine throbbed, and he jerked the gear lever back hastily. Officers were running out of the house on the corner. He saw another blue-clad spy charge from the second machine. Snatching up the sword, he thrust fiercely at the German. The sudden forward swerve of the G.H.Q. car drove the tip across the spy's throat. With a bubbling moan, the man tumbled to the cobblestones. Then the G.H.Q. machine went roaring into the night.

Behind him, the beggar could hear guns crashing. He turned into a side street, drove without lights while he crisscrossed the residence area. Finally satisfied, he brought the car to a halt before the quarters of Colonel Ira Jordan, the chief of American Intelligence.

Two minutes later, a panel silently slid open in the wall of a secret room beneath the colonel's residence. The beggar stepped in from a passage, pressed a button. Amber light shone down from a cannibal tomtom drum suspended from the ceiling, revealing an underground study filled with souvenirs from various parts of the world.

The man crossed a colorful Persian rug, glanced toward an extension phone with a small switchboard. None of the signal bulbs was lit. He laid his violin case on the arms of a deep Turkish chair beside which stood a bronze stand with a large hookah on it. After a look into the bedroom, he went into the third secret room, where racks of uniforms, caps, belts and other accessories were arranged for swift choosing. He sat down before a large make-up table, with mirrors at every angle.

Taking off his grimy hat, he removed a gray wig and set to work with special make-up remover. Like magic, the wrinkles of age disappeared, along with the hollows under his eyes. His gnarled hands and crepey

throat took on the clean firmness of healthy flesh, and his green eyes were suddenly sharp and clear. He peeled off the beggar's rumpled clothes, turned quickly to the shower. Five minutes afterward, dressed in the trim uniform of an Air Service captain, he inspected himself in the mirrors.

All trace of the old fiddler had vanished. In his place was Captain Philip Strange, American ace of spies, the man whom infuriated Germans had named the "Brain-Devil of G-2."

As Strange returned to his study, heavy footsteps sounded in the passage, then the chunky figure of Colonel Jordan appeared. Strange swung around from the file-case he had just opened.

"Is that man conscious yet?" he asked quickly.

"Sergeant Brown's brought him around," growled Jordan, "but he can't talk yet." His bulldog features twisted into a scowl. "See here, I'd like to know what the devil this is all about. You're supposed to be on the most important mission you ever had, and you dash in here—"

"Any further information leaks?" Strange cut in as he drew an envelope from the files.

"Plenty!" snapped the G-2 chief. "The 67th was secretly moved to a front-line drome for Thursday's drive at 11 o'clock last night. At midnight, two Gotha squadrons practically wiped them off the map. Shock troops which shifted billets up into St. Mordain woods last night were shelled and bombed forty minutes after they reached the place. The new dump hidden near Vautry was blown up just before dawn. It's enough to drive a man crazy. Boche Intelligence might as well have offices here in Chaumont!"

"I've a hunch Private Little is going to give us a lead," Strange said grimly.

"Bunk!" scoffed Jordan. "What could he know?"

A peculiar gleam came into Strange's eyes. "He can explain why two of Germany's crack agents were trying to kill him."

Jordan's jaw dropped. "You're crazy!" he sputtered. "Why would they be after a buck private?"

"That's what I want to know," Strange shoved the envelope into his pocket. "Let's go up."

JORDAN followed him into the passage, and they went toward the stairs to the next floor. The G-2 chief stopped as they reached the alcove next to his library.

"Are you sure about this attempt on Private Little's life?" he demanded.

"I should be," Strange said drily. "I had to kill Franz Luderman and a man I think was Max von Scheller to keep him from being murdered."

"Holy Heavens!" exclaimed Jordan. "He listened in amazement while Strange described briefly what had happened. "You're sure they weren't after you?" he said as Strange finished.

"Positive. I was there only by accident, after working around G.H.Q., hoping to spot some one who would hook up with this leak. Beside that, one of the spies shouted Little's name."

Jordan sprang toward the alcove panel.

"Come on! We'll get it out of him if we have to beat his head off. He probably double-crossed them some way—"

Strange went after him into the library. Jordan opened another door, and they went into a room where the private was sitting up weakly on a leather couch. His timid face was still ashen, and there was an angry red welt around his throat. Sergeant Brown, one of Jordan's house guards, stood nearby with a flask of brandy. Jordan motioned him out of the room, wheeled

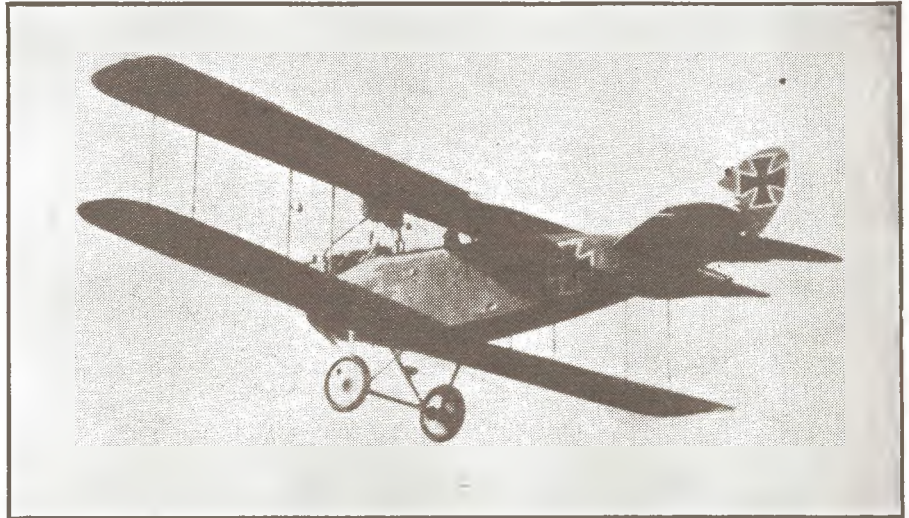
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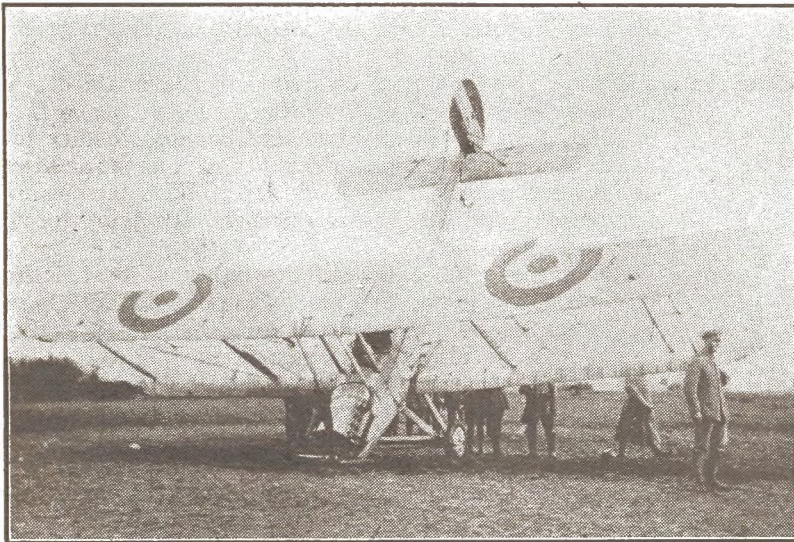
Snapshots of the War



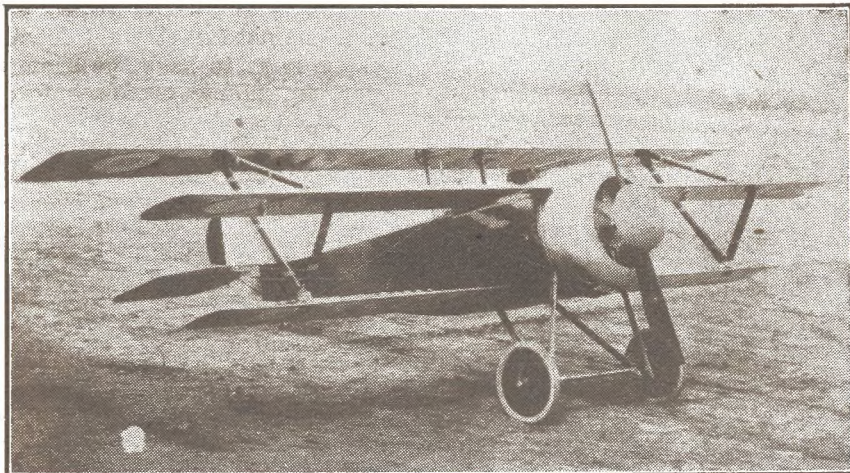
Here's real detail for our modelers—the nose of the British D.H.9, offering unusual opportunity to study motor exhaust, center-section struts, and the Vickers gun mounting outside the pilot's pit. Those racks on the wing carried 112-lb. bombs.



There's real action afoot—or rather a-sky—in this one! The plane, hurtling along for all it's worth, is a German D.F.W. C-5 biplane powered with a 200 h.p. Benz engine. The photo was snapped from another plane while the D.F.W. two-seater was heading across the lines looking for trouble. This particular model was turned out by the Germans in 1916. Wonder if that fellow you see in the cockpit got into a scrap, and if so, how he made out.



Left: A sad tale goes with this one. It's a "one of our ships failed to return" story. This old B.E.2.C. belonging to a British squadron became lost in an early morning fog and landed on the wrong side of the line. The Jerries got themselves a nice new ship and two perfectly disgusted airmen. Bolt on a new four-bladed prop, and the Boche could fly this job back to Berlin. We wonder if any of our readers in England know anything about this crash.



We've been trying to get a photo of the famed Nieuport triplane for years, and at last we managed it, for here she is! Note the strange arrangement of the struts that support the wings. What's most unusual is the fact that they've mounted a Lewis gun—not a Vickers—on the cowling synchronized to fire through the prop. The other name for this craft is, "The Wing-Walker's Nightmare."



This scholarly-looking gentleman is none other than Lieutenant Wilhelm Frankl who was credited with nineteen victories. You'd never select Lieutenant Frankl as an aerial killer if it wasn't for that Pour Le Merit and Iron Cross, First Class, you see on his uniform. But according to the records, he was one of the most deadly air fighters ever developed in the German Air Service.

Can Our A-A Guns Defend Us?

By Lieut. H. Latane Lewis II

Third Corps Area Service Command, U.S.A.

Author of "So You Want to Fly For Your Uncle Sam!", "Aircraft of Tomorrow," etc.

Photos From Signal Corps, U. S. A.

WASHINGTON, the Nation's Capital, faces an attack! But the hour that the enemy will strike is not definitely known, hence a string of observation posts has been established at advance points. Trained observers are crouching in the inky blackness, listening carefully for sounds or signs of the hostile forces. All commercial telephone wires have been taken over for use by the Army and an emergency network of communication lines has been set up.

Several miles behind the observation posts are stationed sound locaters with searchlight batteries. Closer to the city are the anti-aircraft guns.

It is a dark, moonless night. Suddenly a sergeant in one of the OP's southwest of the city raises his head, listens intently. There is a slight throbbing in the air

—more felt than heard. Instantly, he grabs his telephone, calls the sound locaters.

"Airplanes approaching—apparently from the southwest," he barks into it.

Immediately, the sound locater crew springs into action. Headphones are clamped on and the big amplifiers begin to move up and down, back and forth, as the operators "jockey" their dials to determine the exact direction of the attack by checking the sound at its greatest intensity. In a few seconds they have "caught" the enemy and the searchlights are turned on, their great beams reaching out into the night like probing fingers. They are focused automatically by the sound locaters.

Flying at 18,000 feet, invisible to the unaided eye but clearly defined through powerful telescopes, a formation of speedy enemy bombers drones steadily towards Washington. Eighteen thousand is about as high as they can go with their bomb load. With the powerful searchlights directed upon them, the pilots grow nervous.

About three miles behind the lights is located the battery of A-A guns. The reason for this distance is so that when the bombers come over the battery the light-beams will be playing on them at an angle, thus illuminating a greater portion of the plane than would be possible if the lights were directed straight up.

The battery is located near what is known as the *bomb release line*. An airplane flying at 18,000 feet and at 200 miles per hour must release its bombs almost two miles before it reaches a point directly over its target; for the motion imparted by the high speed of the plane causes the bombs to carry forward as they fall. Thus, the missiles do not fall straight down. Our guns, then, are located so as to have the enemy aircraft within range for one minute of fire before they reach this bomb release line.

As the sound locaters and searchlights begin feeling for the marauders, a call is made to the A-A battery to stand by. The battery commander, a captain, shouts to his men to man the guns.

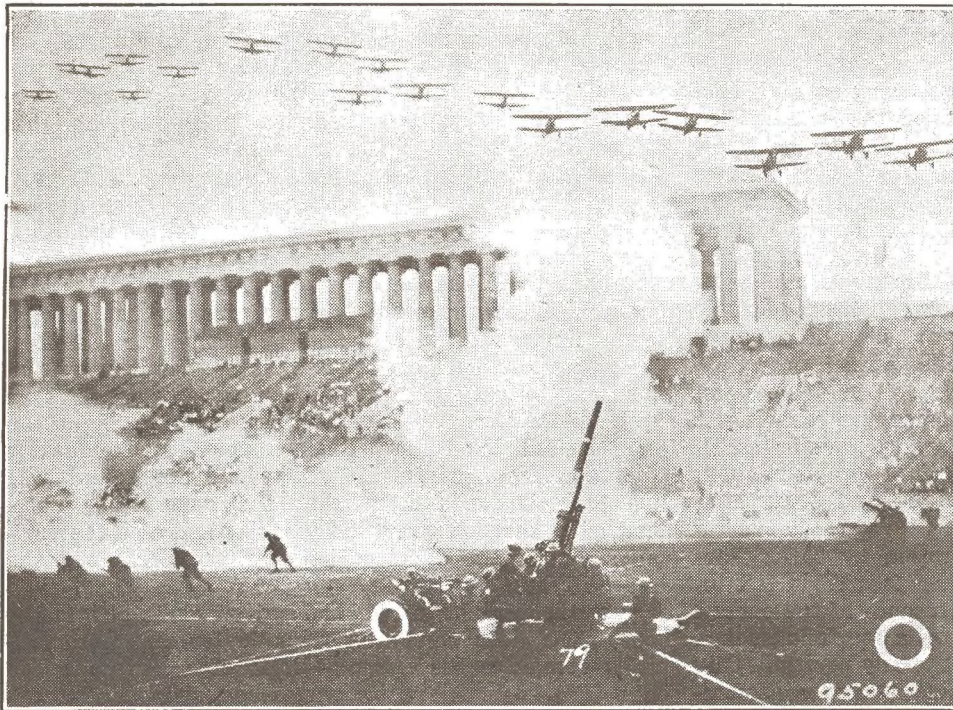
As soon as the searchlights have picked up the enemy, the captain shouts, "Target approaching from right to left, flying high. Report when on target."

IMMEDIATELY the range section goes to work. Enlisted operators begin peering through the stereoscopic height finder and others take charge of the automatic data computer—that uncanny instrument that keeps the guns aimed at the enemy no matter what he does to throw them off.

"On target, sir!" reports the corporal of the height finding crew to the lieutenant.



Enemy air squadrons like to keep their approach a secret—but the secret's out once this Sound Locater is switched on! The four horns of the unit catch the scarcely-audible b-r-r-r of the onrushing planes and quickly translate it into a B-R-R-R-R. Then, in a flash, delicate instruments tell the headphone-helmeted operators not only the exact direction of the attack but the elevation of the menacing craft into the bargain!



Frequent maneuvers keep Uncle Sam's defenders on their toes. Here we see a flock of Curtiss Hawks about to "let go" with some ground strafing during war games in Chicago's Soldier Field. Yes, those "enemy" single-seaters have come in pretty close—but in a real scrap the A-A guns would have "rubbed out" most of them long before the camera man lined up a "shot" like this.

"On target, sir!" echoes an enlisted man at the data computer.

(In other words, they have got the bead on the enemy and the muzzles of the four great guns, moving as one, are automatically following him as he moves across the sky.)

The lieutenant blows a blast on his whistle and shouts to the battery commander: "Range section in order, sir!"

The battery commander, knowing well that he can depend upon his faithful human and mechanical assistants, then barks—

"Fire 20 rounds. Commence firing!"

Instantly there is a deafening report. The guns leap backward against their recoil mechanisms, and mushrooms of black, acrid smoke appear around the muzzles. A few seconds later a second salvo is fired, and others follow in quick succession. About twelve seconds after the first shells left the guns, puffs of smoke appear at the apex of the searchlight beams high above. Then there comes fluttering lazily down an object that looks like a tiny white moth. Another follows close behind it. The A-A crew is registering hits!

Quickly, the planes resort to protective maneuvers. Twisting and wriggling like hooked fish, they try to shake off the searchlights and upset the range of the guns. But it's no use. This well-trained crew can keep them spotted with the lights, and the automatic data computer makes it easy to keep the guns pointed at the place where the planes will be when a shell has had time to reach them.

Before the formation can reach the bomb release zone, several more have been shot down in the wake of their comrades. The others, realizing the futility of continuing their course, turn back. As they disappear out of range, they are hotly pursued by those ominous puffs of smoke.

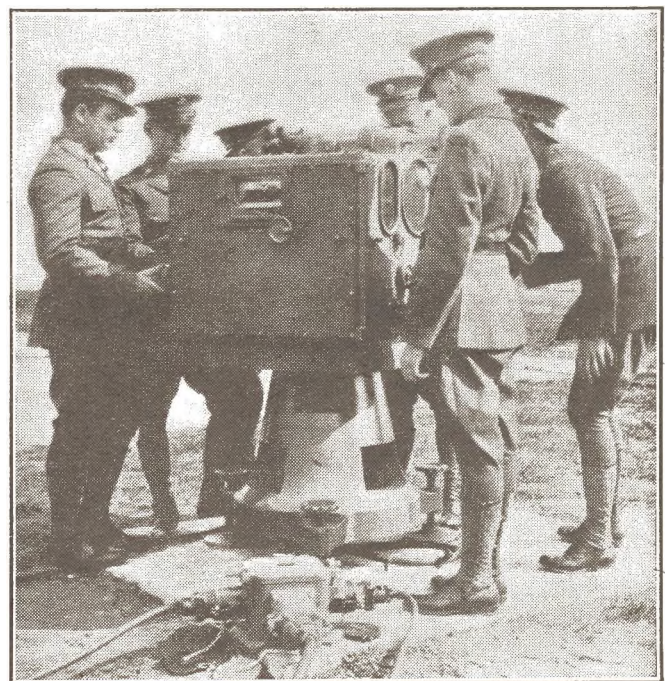
IT is a far cry from this modern A-A equipment to "Archie" of the World War days. If you talk to any flyer who saw service at the front, you will find

Back in the days of the World War, "Archie" wasn't worth a whoop! And since the War, the aircraft sciences have so far advanced that to be any good at all, present-day A-A batteries must definitely prove that they have progressed farther along the road of effectiveness than airplanes themselves. That's a big "order," and the question is: Have they "filled" it? Lieutenant Lewis, who is in close touch with such matters, says that—well, s c r u n c h down into your easy chairs and read what he says—

that he is apt to speak with amusement and contempt of anti-aircraft fire. Such guns, he will tell you—if he is accurately informed—scored only one real bull's-eye in 20,000 shoots. In fact a really effective hit was purely accidental.

However, the guns that our A-A batteries are using today have reached such a high degree of accuracy that they present a real challenge to even our latest high-speed aircraft. Indeed, high-ranking Coast Artillery Corps officers positively assert that *if a four-gun A-A battery can fire upon an airplane for a period of one minute, the chances of its being shot down are*

that he is apt to speak with amusement and contempt of anti-aircraft fire. Such guns, he will tell you—if he is accurately informed—scored only one real bull's-eye in 20,000 shoots. In fact a really effective hit was purely accidental.



And now, here's the brains of the anti-aircraft battery—the Automatic Data Computer. Built into this box is a robot-like mechanism which first calculates the precise position of the enemy plane and then aims the guns—all in the same operation! That spells "finis" for the invaders.

100 per cent. That's real A-A progress!

New methods have been developed of "getting a bead" on an airplane that may be flying so high that it can neither be seen nor heard on the ground.

A battery of four anti-aircraft guns can hurl one hundred 26-pound high explosive shells into the air *per minute*. The guns have a muzzle velocity of 3,000 feet per second and will fire vertically to 40,000 feet. Searchlight batteries operating with them can throw a beam on an airplane almost as high and can track it accurately across the sky. In Hawaii and the Philippines, due to the clarity of the air, searchlights can pick up a target more than 21 miles away!

Now here is an interesting thing: A shell does not have to score a bull's-eye on an airplane to bring it down. There is a deadly area above a bursting shell which the Artilleryman calls the *plinth*—an area about 100 yards long and 110 yards high—and everything within this area will be hit.

The modern A-A gun is controlled by three marvelously accurate robots. The *sound locator* is the instrument which first detects the presence of the enemy. Two pairs of horns are mounted on a truck in such a way that they can be swung about to any position. One pair of horns determines the *azimuth* (that means compass bearing), and while this set of horns is finding out from what point of the compass the marauders are approaching, the other set is swinging upward and determining the enemy's *elevation*. These horns are accurate to less than one degree. Trained enlisted men, earphones clamped to their heads, operate them. They also are trained to tell from the sound of the motors whether the airplanes are bombers, pursuit planes, or

both. Moreover, they are able to form an approximate idea of the attacking force's strength.

As the sound locator men adjust their horns, electrical impulses are transmitted to the searchlights through a device called a *comparator*. These impulses automatically focus the beams on the target. At first, the lights swing in wide circles, then they narrow down to a fine focus with the airplane, or airplanes, pinpointed in their glare. It takes just three seconds to focus the lights on a plane. The comparator is a remarkable instrument, for in lining up the searchlights it automatically makes correction for *soundlag*. You see, sound differs from light in that it travels at a rate of only 1,100 feet per second; therefore, it takes some little time for a distant sound to reach an observer—and the target will have moved a considerable distance from where it was when the sound was emitted. Other factors that the comparator automatically corrects are wind velocity and also the variance due to the distance between the horns and the searchlights.

But the real brains of the anti-aircraft gun is the *automatic data computer*. This instrument automatically computes the exact position of an airplane and aims the guns. A *tracking telescope*, swinging laterally, is used to determine the course or azimuth of the approaching plane. Its height is determined by a *stereoscopic height finder*, which is also a part of the computer. This wonderful piece of mechanism functions as follows:

A telescope is mounted on each end of a long tube. When in action, the telescopes are adjusted until the

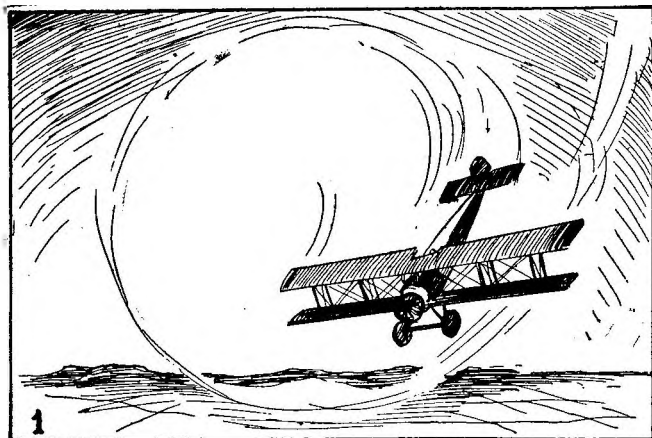
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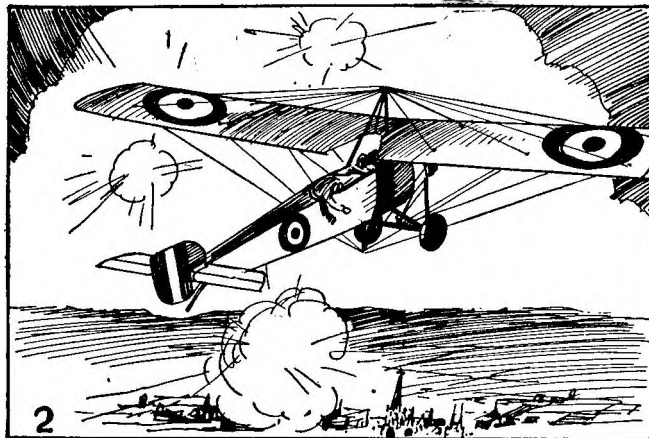
Put them all together and this is what they spell—a complete anti-aircraft battery. In the left foreground is the Tracking Telescope, in the right foreground the Stereoscopic Height Finder, in the center the Automatic Data Computer, and ranged in a semi-circle in the background are the guns. The electric power lines connecting the units inter-relate the action. In the upper left-hand corner of the diagram, raiding planes may be seen approaching.

Lives of the Aces in Pictures

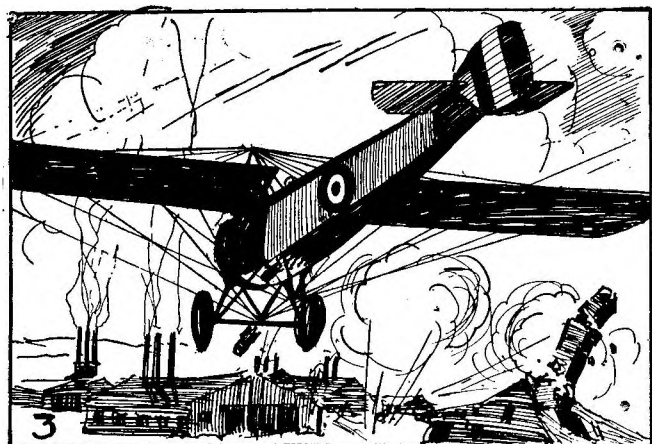
XLV—Adolph Pegoud, of France—6 Victories



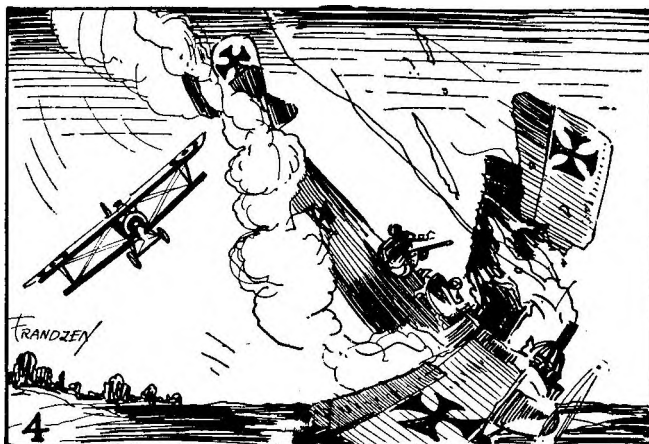
1—Adolph Pegoud was in the aviation service in Morocco before the war. He was among the small group of French aviators who were world famous. Pegoud's renown came from his feat of being the first Frenchman to loop the loop. He also was first to attempt a drop from a plane by parachute.



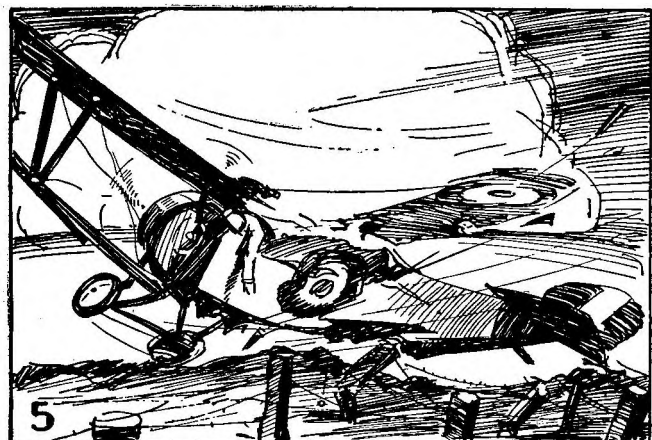
2—At the outbreak of war, Pegoud immediately joined the gallant band of experienced airmen who undertook to get information for their army by use of planes. He went on dangerous reconnaissance trips far back of the German lines. The data he gathered were invaluable to the harassed French ground forces in the fall of 1914.



3—Pegoud, with his machine laden with bombs, went on a long distance raid into German-held territory. He made certain that his bombs would be most effective by waiting until he could drop them at such low altitudes that they couldn't miss the target. He disregarded the danger to himself.



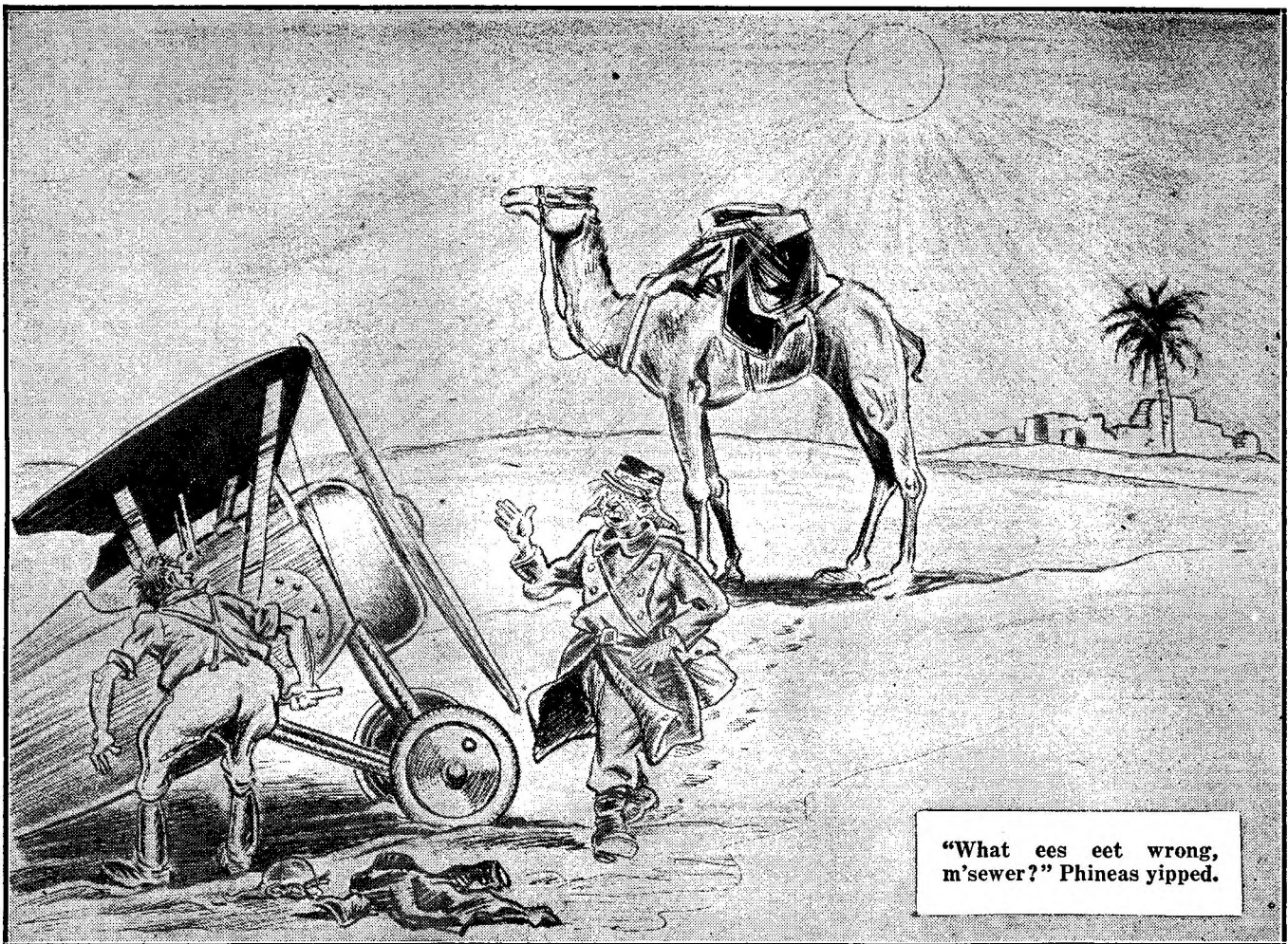
4—Before the war was a year old, Pegoud became an Ace. His battles with enemy planes were incidental to the greater damage he did on his bombing raids. On July 11, 1915 he brought down his sixth plane, following which he received the French Military Medal for his heroism.



5—On August 31, 1915, Pegoud met a two-seater German plane over the lines. He attacked, but during the fight a bullet severed one of his arteries. He was barely able to get his plane over his own lines at Belfort. He died before he could be lifted from his wrecked machine.



6—Adolph Pegoud was born in 1889 at Monteferrat. In his short fighting career of barely a year he carried out more bombing raids than had any other French aviator thus far in the war. During his military funeral, enemy planes circled overhead to drop flowers as their tribute to a gallant enemy.



"What ees eet wrong, m'sewer?" Phineas yipped.

Illustrated by the Author

Doin's in the Dunes

"PHINEAS" SHRIEKS AMONG THE SHEIKS

By Joe Archibald

Author of "T.N.T. Party," "Spy Larking," etc.

IT was spring in Bar-Le-Duc. And since the drome of the Ninth Pursuit Squadron was only three miles from that Frog civic center, it had to be spring there, too. In the apple trees near the old farmhouse in which Major Rufus Garrity kept his Operations Office, the birdlets trilled and warbled in anticipation of the vernal crop of worms.

One morning at daybreak Lieutenant "Bump" Gillis, on his way to the farmhouse from his cubicle, was seen to pause and pluck a crocus. And Captain Howell's thoughts had already turned to love. He was wondering if his heartbeat back in the States was still writing to that halfwit on the battleship *Texas*. But it was into the palpitating heart of Lieutenant Phineas Pinkham that the tracers of summer penetrated the deepest. On the particular morning when this tale begins, Phineas straggled into the Frog farmhouse reading from an open book in his hands. Pilots plunked down

Foreign Legionnaires, it was true, swallowed corrosive cognac without batting an eye. But they choked when the Kraut Intelligence agents added Abd-el-Fizz to their diet. It was then that the action in Morocco got fast. And it got even faster when Phineas met Beni Hazzit—and let him have it!

steaming mugs of java when he started to recite—

*Oh 'tis the season now
to go
About the country,
high and low,
Among the lilacs hand
in hand,*

And two by two in fairyland.

Major Rufus Garrity appeared in the doorway of his sanctum, a look of nausea over his face.

"It is the spirit of spring," gurgled Phineas. "Don't you feel it, Major?"

"Yeah—ha! ha! I'm all atwitter!" Then the Old Man exploded. "Gulp that coffee and get to hell out to those Spads! You have been out of them so long now I bet they're filled with three generations of spiders. There's a war out there about ten miles from here—or haven't you read the evening papers? 'Spring is here! Lilacs! Nuts! I've got a nice spring tonic for you, Mister Longfellow!' he spat at Phineas. "It's a piece of two-by-four with nails in it—"

"Aw right, aw right," Phineas sniffed, "I can see you have none of the fine feelin's. All you think of is gettin' us killed. I bet even the Krauts this morning will not want to fight while choked up with thoughts of spring. Huh—oh, well—"

Phineas Pinkham could be wrong at times. Maybe the Heinies had run out of calendars and had no idea of the proximity of the Lenten season. Whatever the reason, over Mont Sec Captain Howell and his four Spads were jumped by a flight of Albatros Scouts full of tricky plays. The boys of the Ninth were kicked back over the midfield stripe separating the two warring factions. Captain Howell returned to explain it all to Coach Garrity, but Phineas Pinkham had ideas of his own—as usual. Perhaps it was because of two lovebirds he had spotted in the top branches of a tree. A Kraut had chased him down so low during the brief brawl that the tip of one of his wings was grass-stained.

"It is Babette who calls me," Phineas grinned at the world. "I will hie to her—also an estaminet or two. Haw-w-w-w-w!"

THE errant flyer arrived back at the drome three hours later filled with the spirit of spring and also the kind that comes out of grapes when they are allowed to stand awhile in a dark cellar. A big olive-drab A.E.F. car was rolling out of the drome when Phineas nursed his Spad to the dirt.

"That's the trouble," he gulped. "Just as if I didn't get enough in Barley Duck. Huh—'Voose ate trays oiled!' Babette says when I go up an' tell her it is spring. Huh—'Allez veet,' she says. 'What ees thees voose theenk I she ees—ze weenter—bah?' That is a dame for you. Well, she will never see Boone-town. I will leave her flat when the *guerre*—ugh—hello, Casey. Why don't I git out? Why—huh I had no idea I was *ici* so soon.

"Haw-w-w-w-w-w!" The prodigal pilot got out and stretched himself, breathing deeply. "Boys, do you smell the spring, Casey?"

"If it was a spring, it was full of van rooge," snorted Flight Sergeant Casey. "That's all I smell. Even before you landed I says to Brody, 'Have you been drinkin'?' He—"

"Wise guy, huh?" retorted Phineas with a large growl. "Well that is a good way to get busted—in-sultin' an officer. You wait until I see the C. O., Casey!"

"It won't be long," the non-com grinned and ambled away.

It took just two minutes for Major Garrity to have Lieutenant Phineas Pinkham herded into the Operations Office.

"Well, you big-eared beaver," the C. O. cracked. "You been pickin' spring flowers somewhere? Left Howell's flight again, didn't you? Ha! ha! Don't bother to think up excuses, Pinkham. I am not going to do a thing to you this time, ha! ha!"

"Boys," the culprit chuckled, "haw-w-w-w!" I knew the spring would get you yet, Major. It's a time when—"

"You have been drinking, too!" barked Garrity.

"Haw-w-w-w-w!" contributed the lieutenant on the mat.

Major Garrity's jaw suddenly hardened. It was a jaw that one could crack brazil nuts against.

"Lieutenant Pinkham," he thundered, "we will miss you."

"H-huh?"

"You are just the man the brass hats want, Pinkham," Garrity went on, his face growing sourer by the minute. "You are full of the spirit of—the—er—exuberance of youth. Just the morale for the new pilots coming up. You are going to Issoudon, you freckled baboon, and you are going to teach the boys how to dodge and sidestep Heinies. Now laugh—you crackpot!"

"I RESIGN," Phineas yelped. "Get me a piece of paper and a pencil. Oh, I thought there was somethin' nutty about all this. Haw-w-w-w, I will show you!"

"You'll resign, huh?" Garrity yowled. "Not until after you've pushed a wheelbarrow for six months at Blois. I've got you this time, Pinkham, ha! ha! Well?"

"I will get a lawyer," Phineas threatened, albeit gulping. "I will demand a writ of hab—I'll—"

"You'll get out of here right now and start packin' your trunk," the C. O. trumpeted. "That's what you'll do—you great big Spad play-boy!"

The word spread like the news of a sweepstakes winner in a fishing town. While the indignant Phineas was packing his things in his hut, the pilots of the Ninth Pursuit flocked to his door.

"That is Lieutenant Phineas Pinkham," Bump Gillis said, feigning awe. "He teaches people combat flying with the Germans in mid-air—honest!"

"No—really?" Captain Howell gasped. "Why—er—why to think he's right there in the flesh—I'm positively thrilled!"

"Go ahead—you bums!" Phineas howled, pausing in the midst of cramming his belongings into his trunk. "But I will git hunk, you see! It's a long turn that has no laning—er—lane long that—oh well, I know fair weather friends when I see 'em. I go with a light heart as if it was only last night I got here. I—" The banished pilot turned quickly and let something fly. Plunk! In less than

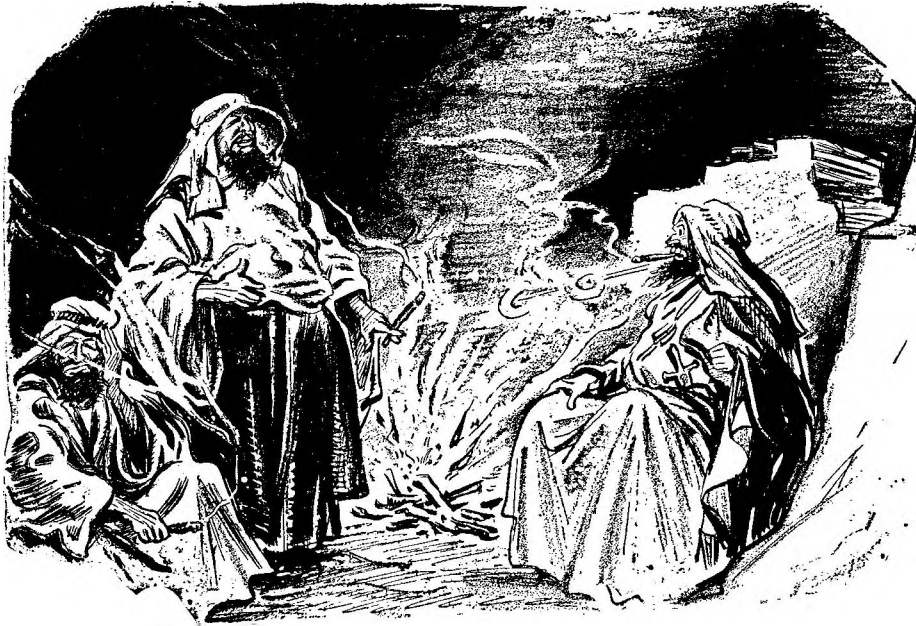
a minute five pilots were stumbling across the field with tears streaming down their cheeks. Phineas followed at their heels.

"Lookit these bums!" he yelped at Major Garrity as they neared squadron headquarters. "Isn't it touchin'? That is showing affection—oh, boys! It tears my heart-strings to leave 'em in such a state, haw-w-w-w-w-w! It took a lot of onion juice to make that bomb. Well, I might as well start see swar. Do I get a pullman or a day coach? Haw-w-w-w!"

"You'll fly that Spad of yours," the Old Man growled. "The brass hats think it will pep the new boys up to see you come in with a crate filled with bullet holes. Hero psychology, an' all that mullarkey, y'know. If I were a cadet and saw that Spad of yours, I'd desert and get back to the States any way I could. It's like sending a punch-drunk pug with his bugle busted in



The Frog pointed at a sign.



"That's the spirit," Phineas chortled into his smoke rings. "Don't be sissies!"

three places and his ears looking like two marshmallows to show some guys how to fight. Ha! ha!"

"Oh, I will forget the insults for now," Phineas sniffed with disdain. "I'll get the bus warmed up—"

"Look at the sky, chump!" Major Garrity snorted. "It's thicker than a sulphur and molasses. You take off in the morning—and don't give me any more guff!"

"Haw-w-w-w-w! Excuse me! I forgot I was in a sissy squadron. Well—"

The Old Man was pulling his fist back when a staff car drove up. A big officer stepped out, glanced around critically for a few moments, then strode wordlessly into the farmhouse.

"That bird looks familiar," Garrity murmured, following the brass hat inside. "Uh—er—good evening," he said aloud. The brass hat whirled.

"Hello, Garrity," the officer greeted. "Remember me? Colonel Dumphey of the Intelligence Corps? Happened to be going through this way on my way to Chaumont. Thought I'd drop in. Things are in the air, Garrity. Chaumont called me from Paris in a hurry. Looks like I'm going to take a long trip."

"Uh—er—maybe it's about that African situation, Colonel?" Garrity prompted him. "Been hearing a lot about that mess down there. Heard the French are withdrawing the Foreign Legion troops from the Lorraine border. Sheiks all stirred up by the Heinie secret agents. That it?"

"No joke," Dumphey growled and settled himself into a chair. As he did so several pilots trickled into the room. They were red-eyed and sniffing.

"You're just in time for mess," the Major said to his visitor. "Join us?"

"They—er—" Dumphey said, gesturing toward the pilots. "Just—er—maybe just laid a comrade to rest? Look quite done in—Major. All broken up—eh what?"

"It is just because they can't bear to see me leave them," Phineas Pinkham answered in place of the Old Man. He had just strolled in. "I wish it was Africa I was going to instead of Issoudon. Maybe you could transfer me to the Intelligence, Colonel, huh? I always wanted to see them Allah-be-praised bums in their bedsheets, haw!"

"Garrity!" Dumphey cracked. "Do you allow your men to talk to a superior that way? Lieutenant, you're too damned fresh!"

"Yeah!" agreed Phineas. "Well—huh—excuse it, please. It is only that I would like to help out no matter

what place it would take me, sir." Then he went rattling on, "Boys, if them Arabs gang up on the Frogs in Africa—listen to me—haw-w-ww! If I was in the rice business in China, I bet you would hear me squawk about the price of ostrich plumes in Australia. Haw-w-w, why should I worry about the Arabs, huh? I—"

"Excuse me, Colonel," interrupted Garrity, "would you mind lending me your cane?"

A few seconds later the Colonel got his cane back—in two pieces. It had hit the back of the Pinkham chair a split second after Phineas had vacated it. Colonel Dumphey got mad at the Old Man and refused to stay for victuals. Major Garrity swore and assured the brass hat that nobody would break a heart over his decision. One word led to another until the Colonel took a punch at the Major—but his timing was bad. He left the drome a few

minutes later with his nose the color of a persimmon.

"Haw-w-w-w-w-w!" Phineas enthused from the shelter of the ammo shack. "If the Old Man don't look out, I will start respectin' him in spite of myself. Oh, boys, what a left hook he's got!"

NOW the situation across the Maxfield Parrish blue waters of the Mediterranean was no joke any way you looked at it. The Moslem boys were grumbling in their beards. They were anxious to get hunk with the infidels who had long ago chased their grandpas out of Spain. The pot had been boiling for weeks kindled by some skullduggery experts from Potsdam. And something was keeping it boiling. The Allied Command wondered what it was—wondered what they could do to stop it. From every part of Islam, reports had it, the sun-tanned sons of Mohammed were making their way to a torrid rendezvous in the shadows of the Atlas Mountains. The three great Kaid of the Atlas, the bashas of Tarudant and Tiznit, and sheiks from every place were reported as being bent on cutting themselves a piece of throat. The Allies needed Lawrence of Arabia and thought of transferring him, but no one seemed to know where he picked up his mail. Unbelievers got out of the Moslem city of Fez by every means of locomotion lest they leave their heads behind to be salted and made into mantel ornaments in Mohammedan cottages. It was a grave situation, indeed, and to make it sound worse, one had only to mention the names of the two tough Moslem boys who were behind it all, namely Sidi Okra, the Scourge of the Oases, and Abd-el-Fizz, the Butcher of Biskra. Allied leaders sat on the edges of chairs waiting for word from Intelligence Corps men that never seemed to come. They had pulled thirty-seven battalions of Frog troops from the Western Front and had sent them on the double to the port of Marseilles. Meanwhile, across the Rhine, Heinies in the know chuckled and toasted the far-away sons of Allah with very fiery *schnapps*.

The morning after the Colonel's visit to the drome of the Ninth Pursuit Squadron, Phineas Pinkham got ready to leave for Issoudon. The sky was still the color of pea soup when Sergeant Casey ordered ackemmas to drag out the Pinkham air chariot and get it warmed up. Major Rufus Garrity poked his head out through the window of his sanctum, shook it doubt-

(Continued on page 81)



WISECRACK-UPS



Taxi in on this runway and pick up a plane load of laughs! In this department, we present a collection of jokes, cartoons, and humorous verse. For all original contributions which we can use here, FLYING ACES will pay \$1. Contributions will not be returned—except art work with stamped return envelope.

DIFFERENCE OF OPINION

Mary: I hear Tommy couldn't get into the air service on account of his eyes.

Jane: Oh, but I think his eyes are wonderful!

Dumb Dora saw a plane the other day that had no gasoline gauge. Now she wants to know how the pilot can tell when he runs out of gas.

OUCH!

Garrity: That new propeller of yours throws your ship off center. All the pilots are discussing it.

Phineas: Yeah, it's the torque of the town! Haw-w-w-w-w.

PING!

"I hear Eddie calls his new plane, The Bullet."

"Yes, but it's just a blank."

NO CONCERN OF THEIRS

Co-Pilot (in borrowed ship): Good heavens, man, the left wing just fell off!

Pilot: Don't worry — it isn't our plane.

GOOD TACTICS

Instructor (at Issoudon): Now, men, what is air strategy?

Cadet: It's when you don't let the enemy know that you're out of ammunition but keep on firing.

PUT-PUT-PUT!

Mechanic (to pilot): Say, have you got a motorcycle seat?

Pilot: A motorcycle seat? What for?

Mechanic: Well, I've just finished putting your plane back together and I have enough parts left over to make a motorcycle if you have a seat.

HELPFUL

Pilot (calling back to airport by radio): I'm lost!

Nitwit Operator: Quick, tell me your location!

IT SYRUPS HER RIGHT!

"How did Aunt Jemina make out when she attempted to land after her first solo flight?"

"She pancaked."

FROSTING

"Poor Percival cracked up in that snow storm."

"Well, that proves that not even a cake-eater likes icing on his plane."

GROUNDING

First: I thought Mr. Newlywed was going to fly up to New York?

Second: He was, but he took some of his wife's biscuits with him and couldn't take off with such a load.

MISSING AIRMAN

Father (to son): That's a fine airplane you're drawing—but where's the pilot?

Son: Oh, he's still in the ink bottle.

CALAMITY

First stude (as plane falls into spin): Quick, what do I do now, instructor?

Second Ditto: Hell's bells—aren't you the instructor?

AND HE'S NOT DOWN YET

Cadet (rushing into office): Say, Smith just made a one point landing!

Instructor: What? Where is he?

Cadet: Stuck on a church steeple!

SLIGHT ERROR

New Shavetail: Say, look at the horrible insignia on the side of that bombing plane.

Old Timer: Shhh! Not so loud. That's the Squadron Commander looking out the window.

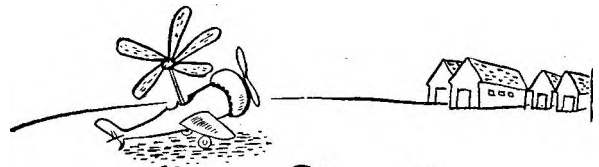
REASON ENOUGH

Phineas: Say, Casey, why wasn't you ever a pilot?

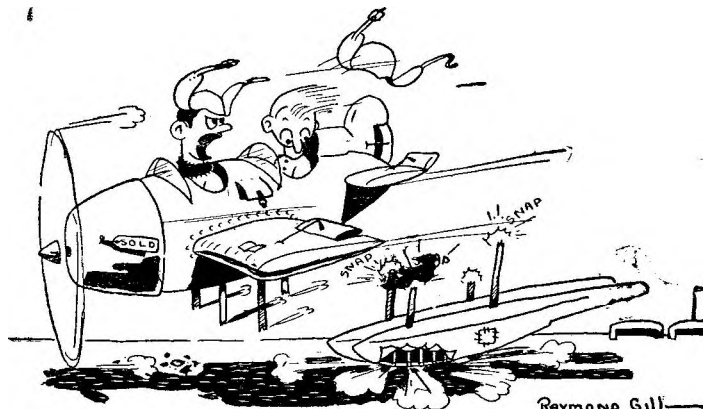
Casey: On account of a broken neck.

Phineas: But you haven't got a broken neck.

Casey: That's just it. I don't want one!



"They say a florist designed it."



"Heigho, Montmorency—lend an ear! Unless I am sadly in error, the gentleman from whom we purchased the air vehicle in which we now find ourselves aloft—that is to say, the agent representing the firm which manufactures these aircraft—pointed out in truly emphatic manner (stop me, if I am wrong) that this plane, or "job," if you prefer, was an amphibian. And, by the by, have care, man—you are losing your helmet!"

Russia—The Air Power Enigma

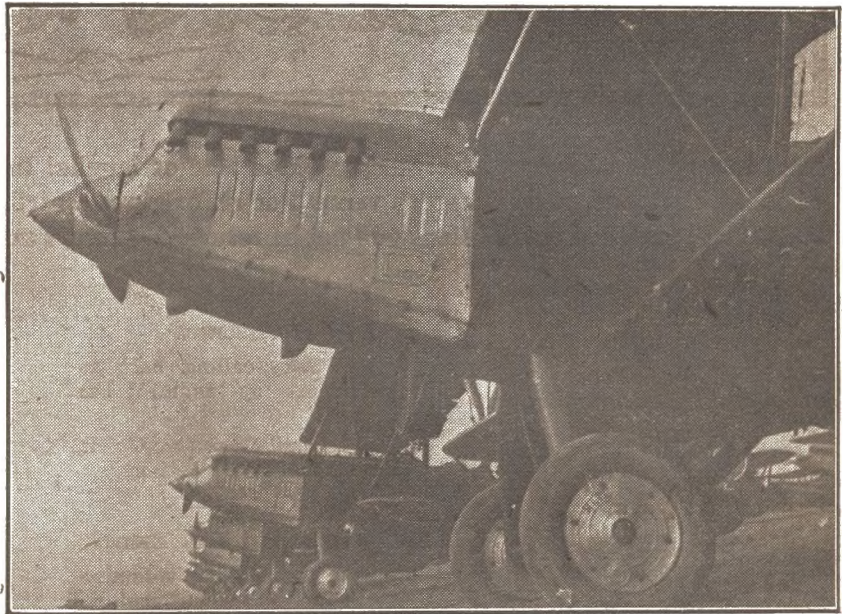
Soviet Air Fleet officials spell the word, "Secrecy," with a capital "S"—hence there's a great deal of mystery as to just where the Reds stand in sky strength. But it's almost a sure thing that they boast at least 3,000 fighting craft. And plenty more are on the way!

* * *

By David Martin

Author of "Wings of the British Lion," "France—First in Air Power," etc.

IN 1932 the Central Directorate of the Red Air Force, military arm of the U.S.S.R., drew up a program for the ultimate production of 8,000 military planes. Of these, 3,000 were to be multi-engined bombers of the A.N.T. type. The rest were listed as: 120 long distance reconnaissance machines, 80 training planes, 342 all-metal fighters, 112 army-cooperation machines, 12 torpedo-bombers, 12 special torpedo-carrier seaplanes, 63 bombing seaplanes, 242 fighter-seaplanes, 86 reconnaissance seaplanes, 18 school seaplanes, 6 light escort (Zodiac type) airships, and many observation kite balloons. The program also included 20,000 aero motors of



Sovfoto

The caption that the Russians sent over with this photo didn't tell us much—but we figure these ships to be R-5 two-place reconnaissance jobs. They employ the M.17 engine, a Soviet-built B.M.W. The armament is four guns and the speed 153 m.p.h. Note the racks for light fragmentation bombs under the lower wings.

various types. All in all, it was a real order!

Had this program been immediately completed, Russia would undoubtedly have the most impressive air service in the world. As far as is known, the schedule was not fully realized, mainly because the existing plants capable of turning out military types were not sufficiently organized for such a venture. Exactly how many fighting machines Soviet Russia has today is a question, but European writers all agree that 3,000 first line fighting planes would be nearer the mark, than, say, 1,000.

Since 1932, the Russian War Aircraft Trust, controlling body of Russian Military Aviation, has organized a string of specialist factories for the production of standardized parts, such as landing wheels, piston rings, propellers, crankshafts, cylinders, gears, and pumps. These plants took over full control of certain forests to assure sufficient wood for frames, spars, and propellers. Two plants turn out special steel. Chrome-molybdenum tubes are manufactured at the Kremarterski plant, and stainless steel is turned out at the Ischewoker plant. The new Magnetogorski Steel Works, recently completed at a cost of 800 million rubles, has a total production of seven million tons of first class steel a year. Factories have been organized for the production of instruments, cameras, tires, elastic cord, bomb sights, and wireless equipment.

As far as can be learned, fighting aircraft is being turned out at six government factories. Four government firms manufacture engines, and three more are working on aeronautical accessories.

Plant No. 22 at Moscow is said to be the most complete outfit in the world for producing modern aircraft. It was originally the Russian branch of the German Junkers firm, but it has now been greatly enlarged and fitted to build all-metal machines under the direction of A. N. Toupoleff, the noted Russian aircraft designer.



Sovfoto

A mass bombing formation puts on a "show" over the celebrated Red Square in Moscow. Those hurtling low-wings certainly contrast sharply with the mosque domes of Old Russia seen in the right foreground!

Here, 80,000 square feet of factory floor space is now being used to manufacture single-engined biplanes, twin-engined long-distance fighters, single-seat jobs powered with Jupiters, and the noted A.N.T.6 four-engined night bombers.

Plant No. 31 at Taganrog, on the Sea of Azov, is equipped to build machines for the Russian aviation regiments located along the Black and Caspian seas. It is believed that 7,000 men are now employed there. The factory is capable of turning out at least 1,000 fighting planes a year.

Plant "B" at Voronesh opened up in 1934 with 9,000 employees making all-metal airplanes. How many have been turned out so far cannot be learned. Owing to the complete secrecy that surrounds everything of a military nature in Russia, it is utterly impossible to calculate the actual strength of the U.S.S.R. Air Army.

The Directorate of the Red Air Force is divided into six sections. They operate as follows:

1st Section—Technical section which takes the responsibility of purchases and inspection of raw materials. Works and buildings, construction and maintenance, communications and control of land and sea bases is also part of their duty.

2nd Section—Devoted to information and liaison work.

3rd Section—Responsible for aerial tactics, war preparations, photography, and navigation problems.

4th Section—Assumes the work of supplies.

5th Section—Concerned with Personnel.

6th Section—Devoted to Medical problems of an air service.

In addition to these there are three independent sections, actually branches of the non-military O.G.P.U. which deal with scientific research, foreign propaganda, and spying. This last branch actually keeps



Sovfoto

Soviet airmen get intense training. The machine above is the famed Grobovsky G-10 used as a basic school ship by the Red Air Fleet, but those in the "know" report it's only a few miles an hour slower than the high speed fighters. Two guns may be fitted in the streamlined center-section. A single training-school gun will be noted protruding from the leading edge of the right wing.

close watch on the various sections and the attitude of the workers. In that way it attempts to assure efficiency.

In the 3rd Section, we find picked graduates of the Russian Military Academy, who are held for a period of five years—under the watchful eye of the O.G.P.U. These men outline the tactical plans and military moves of the various air regiments that make up the air defense.

Actually, the control of military aviation in Russia is in the hands of the Workers' and Soldiers' Council, and the control of the Red Air Fleet is exercised through the Red Army organization. The design, development and construction of new types is not carried far in the aircraft factories but by a number of experimental and research establishments, in official competition. The successful types that come out of this competition are then put into production in various

RED RUSSIA'S AIR FIGHTERS

Single-Seat Fighters

Name	Type	Motor	Armament	Top Speed	Remarks
1-2 bis	Biplane	650 h.p. M. 17	2 Vickers	150	Probably much faster.
1-4	Sesquiplane	580 h.p. M. 22	2 Vickers	183	All-metal fighter.
1-3	Biplane	650 h.p. M. 17	2 Vickers	168	12-Cyl. Vee water-cooled engine.
1-6	Biplane	625 M-15 Radial	2 Vickers	199	Copy of Bristol Bulldog.

Two-Seat Fighters

D 1-2	Biplane	650 h.p. M. 17	1 Vic., 2 Lewis	168	Open Cockpits.
D 1-3	Biplane	650 h.p. M. 17	2 Vic., 2 Lewis	176	Steel Fuselage.

Two-Seat Reconnaissance

R-3	Sesquiplane	450 h.p. L.D.	1 Vic., 2 Lewis	140	Russian-built Lorraine-Dietrich motor.
R-5	Biplane	650 h.p. M. 17	2 Vic., 2 Lewis	153	Has Fairey "Fox" motor mounting.

Twin-Engined Bomber or Torpedo Carrier

TB-1	Monoplane	2-650 h.p. M. 17s	6 Lewis	130	Carries crew of six men.
TB-2	Sesquiplane	2-650 h.p. M. 17s	4 Lewis	134	Also used as heavy bomber.

Single-Engined Flying Boat

MR-1	Biplane	650 h.p. M. 17	4 Lewis	152	Russian-built Savoia S. 62
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Twin-Engined Open-Sea Flying Boat

MDR-1	Sesquiplane	2-650 h.p. M. 17s	A Secret	134	Motors mounted in upper wings.
MDR-2	Monoplane	2-650 h.p. M. 17s	4 Lewis	135	Copy of Rohrbach with pusher motors.

Four-Engined Bomber

A.N.T. 6	Monoplane	4-650 h.p. M. 17s	4 Lewis	136	Long-distance bomber.
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Five-Engined Bomber

A.N.T. 14	Monoplane	5-480 Jupiters	A Secret	135	Re-vamped Passenger Carrier.
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Three-Engined Fighter Bomber

Ju. 30	Monoplane	3-425 Junkers	6 Lewis	†	All-metal high-speed bomber-fighter.
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government factories located throughout Russia.

Chief among these research establishments is "Cahi" (Central Aero-Hydrodynamic Institute) which is headed by Chief Engineer A. N. Toupoleff, mentioned above, and from whose initials, "A.N.T.," we get the designation of the leading Russian fighting planes.

To date, many of the Russian models are actually revamped versions of other machines produced outside of the country, but for which the manufacturing licenses have been purchased. This also goes for many Russian aero motors. For instance, the Russian R.I.M.5. craft appear to be British D.H.9's. They're still powered with a Russian version of the old Liberty.

A glance over the available information on modern Russian aircraft discloses some interesting features. As the Red Air Fleet seems to be organized as a separate unit, and not split up into an Army and Navy air service we must list them under their type groupings, regardless of whether they are used by Army or Navy pilots. In general, they run as reconnaissance and light bombing planes, heavy bombers, torpedo-carriers, single-seat fighters, two-seat fighters, sea-reconnaissance, open-sea reconnaissance, training land planes, and training flying boats.

The accompanying chart gives an idea of the various types and their performance. The M.17 motor, mentioned so many times, is believed to be the German B.M.W. made in Russia and the Lewis guns mentioned are generally the same as used in other European countries, with a few changes in barrel-cooling devices and in some cases the method of feeding in ammunition. The fixed Vickers guns are exactly the same as those used in Great Britain.

THE single-seat fighters appear to have nothing startling in the way of speed, and yet when one considers that most of them use power plants that develop well over 600 h.p., one wonders what happened to all the "swift" that should be there. The single-placers are generally biplanes in design and have the typical Vickers mounting. Actual photographs of these machines are unusually difficult to obtain.

The 1-4, a sesquiplane of all-metal construction equipped with the M-22 nine cylinder radial (which we presume to be either a British Jupiter or the French Salmson) appears to be the most modern of the lot. It is made of Koltchougolumin, a new light metal developed by Russian engineers, a mixture of dural-alloy which is said to have a tensile strength of 25 tons per sq. in. in its hardened state. The 1-6, which appears to be a copy of the British Bristol Bulldog, has a few miles an hour on the 1-4, probably owing to its wooden frame, monocoque fuselage, and an engine which turns out about 70 more h.p.

In their two-seat-fighter classification, the Reds seem to have two interesting mounts. The D1-3 tops 176 m.p.h. with a 650 M.17 motor and carries four guns. This machine is smart in appearance, having the motor mounted above a tunnel radiator in line with the leading edge of the lower wing, which is also fitted with shutters. The D1-2 is a lighter model with a wooden monocoque fuselage and cross-axle Vee-type undercarriage.

In the two-seat reconnaissance class, the R-3 and R-5 seem to hold sway. The R-3 is the A.N.T.3 ship

from the "Cahi" shops, a sesquiplane in form with the upper wing mounted on streamlined center-section struts. The wing is built up on two Warren truss girders covered with Koltchougolumin and carry narrow chord ailerons. The lower wing is built up on metal tubing and profile ribs.

The fuselage is also made up of this Russian metal, and behind the engine bulkhead it's actually triangular in cross-section, with slightly domed sides faired to a U-section aft of the cockpits. Only three longitudinal members are used in this body. The undercarriage is the split type, consisting of two Vees hinged to the bottom center line of the fuselage. These Vees are attached to two telescopic legs, the upper ends of which are attached about half way up the sides of the fuselage. The springing is done with rubber cords.

The M.17 motor is mounted in much the same way as the Rolls Royce Kestrel on the Fairey "Fox" and is cooled by a retractable radiator set under the fuselage.

In the torpedo-carrying class (for example, the TB-1, which is actually the A.N.T.4), the Russians do not seem to have discovered the use of the single-engined machine, such as the American and British services use. Theirs are two-engined jobs utilizing the M-17 motors.

The TB-1 is a cantilever monoplane entirely built of Koltchougolumin. The center-section of the wing is built as an integral part of the fuselage. The outer wing sections taper in chord and thickness and carry balanced ailerons. The fuselage is all-metal and built up in three detachable sections covered with corrugated sheet.

The TB-1 carries a crew of six. The observer-bomber is accommodated in the nose and also has a prone bombing station set in the lower part of his cockpit. The two pilots sit side-by-side just forward of the leading edge of the wing. From this control pit a passageway runs aft through the bomb chamber to two rear gunners' cockpits, both equipped with double gun mountings. From this same passageway, access may be gained to the wing tanks and engines by the co-pilot, who acts as engineer officer. The undercarriage is built to take wheels, skis, or floats.

The rest of the equipment is not particularly interesting, except for the A.N.T.6, a four-engined bomber used for

long-distance work. This ship is a monster monoplane designed after the Maxim Gorki, which crashed some months ago. Few real details on it are available, but it is generally known that dozens of these machines have been built recently and delivered to squadrons all over Russia.

FROM all this, one begins to get the impression that the Red Air Force will soon be well stocked with gigantic multi-motored battle planes. It also indicates that Russia is going in for an air fleet, built on the assumption that future war in the air will be conducted by great fleets under the direct command of an Air Admiral operating from a large flagplane of the Maxim Gorki type; for anyone who has studied the general layout of the Maxim Gorki, will realize that it is nothing but the flagship of an aerial armada, which may, or may not be, something to think about.

Russia appears to have the planes, the financial

(Continued on page 80)



Here we see Russia's A.N.T. 3 ship of the 1934 vintage. This craft mounted a 450 h.p. Napier-Lion engine. It carried two guns and was said to do 165 top.

FLYING ACES PICTORIAL FLYING COURSE

ACE MCGOY YOUR INSTRUCTOR

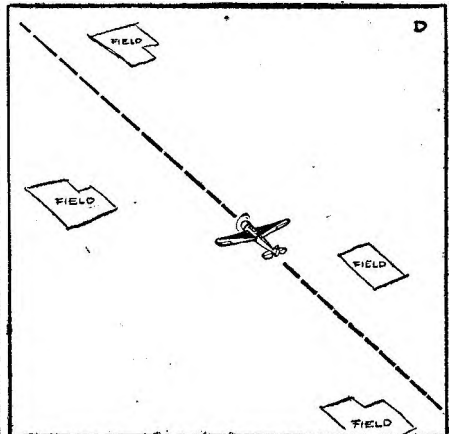
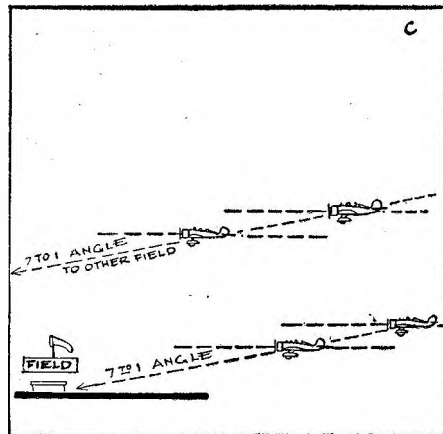
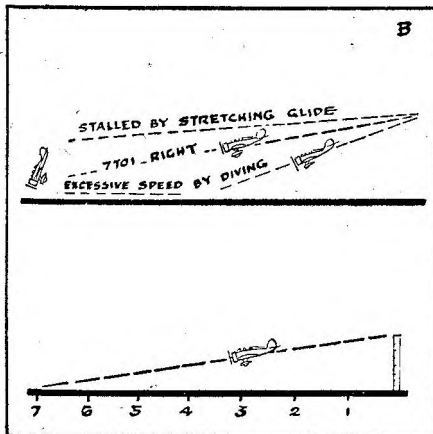
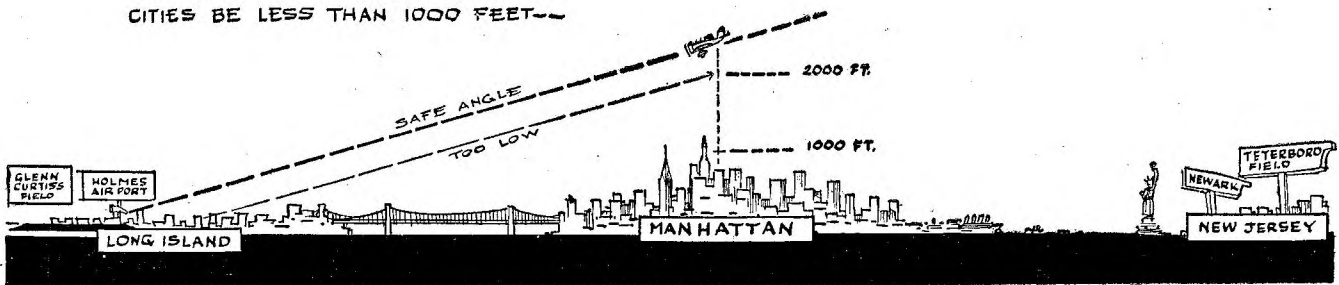
LESSON NO. 3273

FORCED LANDINGS

FROM AIRCOMMERCE REGULATIONS

- AT A HEIGHT SUFFICIENT TO PERMIT A REASONABLY SAFE LANDING---
- IN NO CASE SHALL ALTITUDE OVER CITIES BE LESS THAN 1000 FEET---

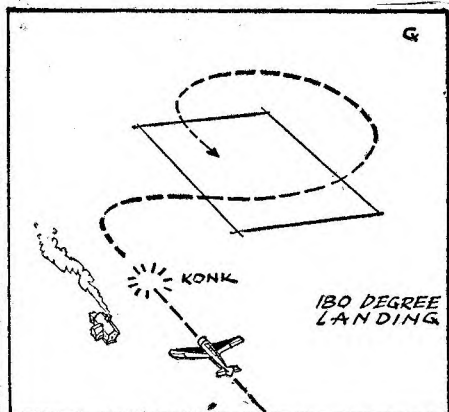
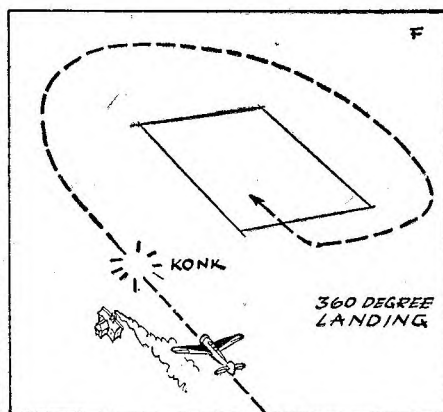
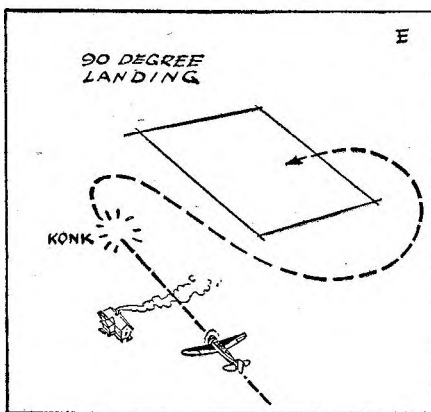
THE law says you must fly at an altitude no less than a thousand feet over a city. But if you look at your Air Regulations a little more closely, you'll see that to be safe in many cases you've got to have a lot more altitude than that.



ALL planes have their *gliding angles*. In most instances, training ships have a gliding angle of about 7-to-1. Which means that these craft glide out seven feet for each foot of altitude they lose. At a steeper angle, you gain excessive speed; at a lesser angle, you drop.

THE safe pilot tries always to fly at an altitude from which he may safely glide to a possible landing spot. When emergency fields are far apart he stays high "upstairs" where his gliding angle assures him the greatest gliding distance.

HE keeps his eye peeled for landing fields and flies past them as you would jump from one stepping stone to another while crossing a stream. He is *always* prepared for a forced landing. When one field is behind him, he trains his eye on another, or perhaps two, ahead.



HE never loses track of the wind direction, and he keeps constantly in mind the maneuvers he would be forced to execute in order to get into the field he has spotted should his motor *konk*.

IF he is flying into a head wind, he flies as low as safety permits, because head winds are milder at lower altitudes. In event of engine failure, he then does a 360-degree landing maneuver.

OR in case of engine failure while flying down wind, he employs the 180-degree landing maneuver. The secret of safe cross-country flying lies in keeping within the gliding angles of fields ahead.

Death Flies the Electra!

* * *

From the antenna of that sleek transport that roared along the beam into the Northwest, there suddenly rang a radioed cry: ". . . . Calling WREG Flight 9 calling WREG Madman aboard! He's gunning here You dirty My—" There followed a loud concussion that made all who listened cringe. Then ominous silence! But not for an instant did the swift airliner waver from its path. Bearing its screaming human cargo, it hurtled on under devilishly precise control—for around its wheel were firmly wrapped the bony fingers of Death!

* * *

THE Black Bullet was hurtling through the starry night under the guiding hand of the Griffon. Her compass read SE by E and her air speed indicator needle twinkled between the 320 and the 350 mark. Scranton, flecked with the glare and flame of mine heads, lay a few miles ahead. The leaden film of industrial soot hanging in the sky softened the lights of the highways below.

"We're still flying the beam?" the Griffon grinned over his shoulder at the man who huddled behind him under the high-speed gun mounting.

"You'll be bashing your beak into one o' them Electras on the Buffalo run," replied his companion.

"Not tonight. I can see pretty well. And say, here comes one now!"

"Sure, but if you're flying east, you should be on an even-number altitude. You're at 5,000 feet!"

"Right, Pulski. I'll take her up a thou'."

The Griffon watched the lights of the oncoming Lockheed Electra, an Amalgamated Line ship heading for Buffalo, out of Newark.

The Black Bullet, the Griffon's high speed amphibian, climbed like fury and the altimeter quickly showed 6,000. The big Avia motor purred beautifully in the heavy night air, and the pilot sat back and watched the air-liner approach. Then, without realizing what was in store for him, he shoved the wavelength lever of his radio over to 61 meters and listened on the chance that the pilot might have spotted him and would report that he had sighted the outlaw Black Bullet sought by every agency in the country.

But no sooner had he spun the lever, than he caught frantic cries.

". . . Calling WREG. . . Flight 9 calling WREG. . . Flight 9 over Scranton. . . WREG. . . Madman aboard!"

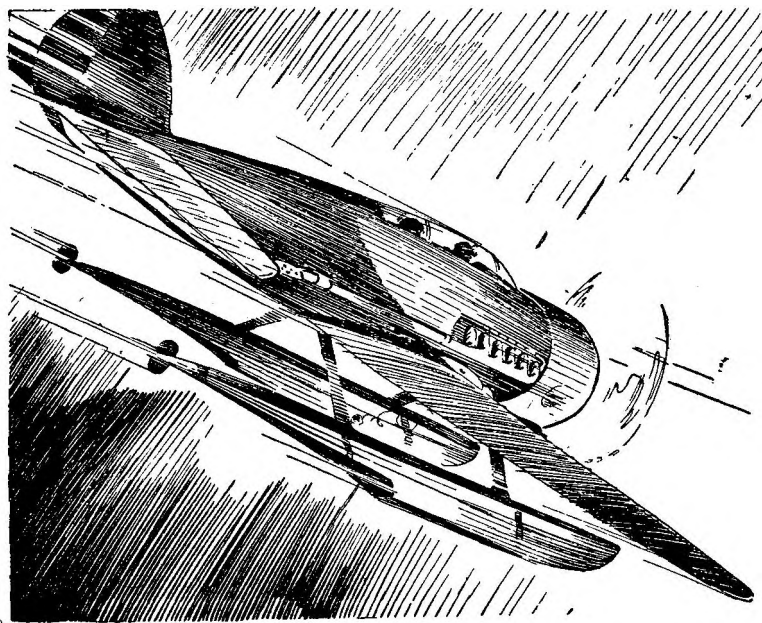
There was a loud concussion in the earphones that made the Griffon cringe. . .

"Flight 9 . . . calling WREG!" the voice screamed again. "He's gunning here. . . You dirty. . . My—"

It all ended with a piercing scream and another loud report.

The Griffon turned, stared at the man behind him.

"Did you hear what I heard, Pulski?" he said, noticing that his rear cockpit man was wearing a head-



Illustrated by Alden McWilliams

set, too, and sat hunched over in a listening attitude. "Look at her," the man addressed as "Pulski" barked. "She's still flying level."

The Griffon peered out to see the Electra coming on as though nothing had happened.

"Follow it!" the Griffon growled. "I'm going to see what went on there."

"There *was* two shots," agreed the man in the rear.

"Two shots—two pilots. Look down there now!"

A man could now be seen shoving up a small hatchway in the roof of the Electra cabin. He crawled out, lay flat along the top.

"Look," said Pulski, "he's doing something to the radio aerial. He's fixing a small bundle of some sort there."

"Yes," cracked the Griffon, "and I'm going aboard that boiler."

"How?" . . . You're nuts!"

"Okay. I'm nuts, but how are they going to get her down if those pilots are dead? That guy has a parachute. He'll jump surer than Satan."

Pulski wagged his great head: "Yeh, that's the tip-off."

But at the same instant, something rattled along the fuselage, spanged off the metal parts of the Black Bullet. The Griffon turned, yanked out the double Hotchkiss guns, and poured their wrath into a high-winged monoplane that was diving on them from above.

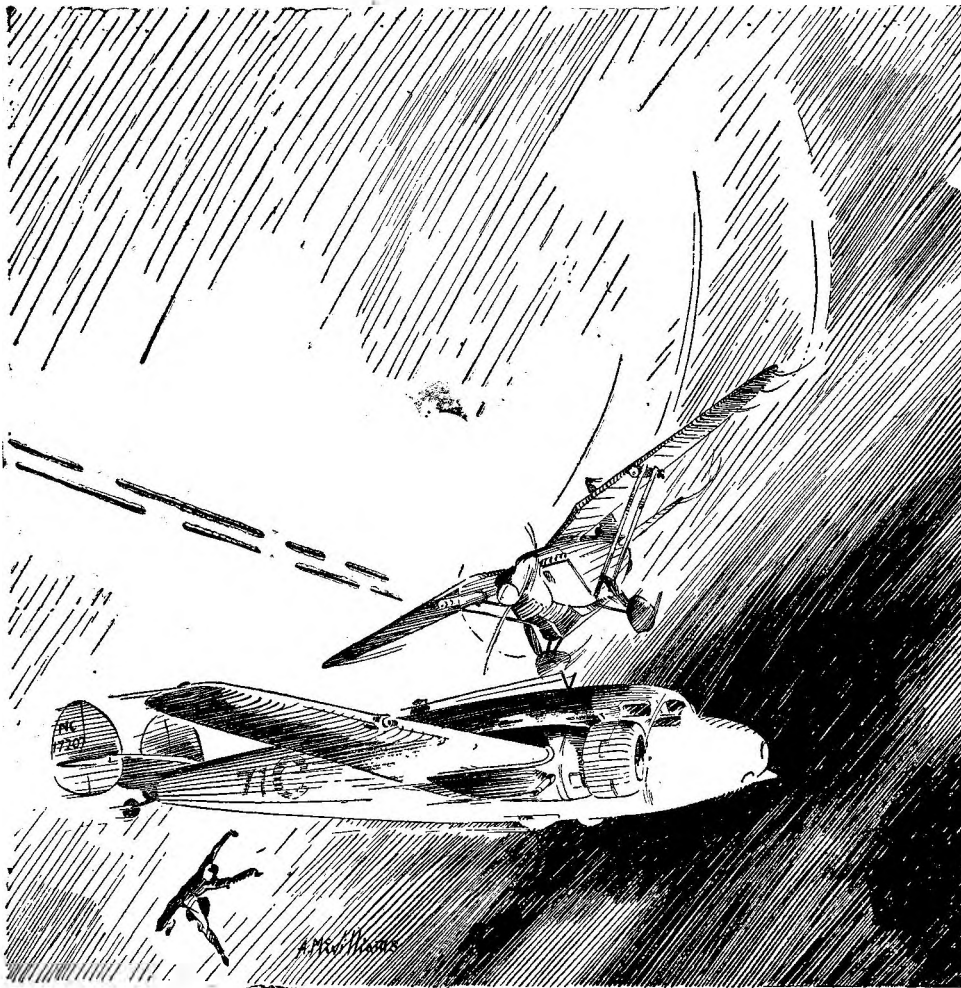
As he pounded home the slugs, the Griffon noted the unusual lines of the mysterious gull-wing machine. The airfoil was braced with two streamlined struts and the wheels were covered with spats. The nose was long and slender, indicating that it housed a water-cooled power plant of some sort.

"Keep over that Electra," the Griffon barked as he hurricaned lead upon the strange monoplane. The gull-wing fell back under the Black Bullet's torrent. But then suddenly it turned and dived head on for the body of the Electra. In a flash, the man on the cabin hurled himself off the transport, leaving his mysterious package behind him. And as he disappeared in the velvety night blackness, the amazed Griffon saw the high-

SENSATIONAL "GRIFFON" NOVELETTE

By Arch Whitehouse

Author of "Victims of the Voughts," "Clue of the Cockpit Clock," etc.



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wing monoplane nose down carefully and skim its wheels over the body of the transport, as though it were trying to ram it broadside.

"See that?" screamed Pulski. "The package!"

"Yes, he picked it off with a wire hook fixed to the undercarriage. Say, he took an awful chance! And now he's racing away. But even so, I'm going aboard the Electra. I'll go out on the port wing. You put her under the Electra's starboard wheel so that I can transfer. Get it?"

"I get it!"

"And follow her after I go aboard. I'll try to get her back to Newark. You pick me up there."

THE Griffon drew a tight-fitting mask down over his face, took another notch on his belt. Pulski steadied her while he climbed out, then nosed down after the Electra which still flew a straight course.

The Griffon drew off his heavy gloves, then huddled close to the sleek body of the Black Bullet and waited for his pilot to jockey the craft into position.

With rare skill, Pulski eased her under the speeding transport, fought the slip-stream of the two motors. The Griffon crouched, peered ahead. He watched his pilot bring the Black Bullet up and under, until he could feel the blast of the prop. Then the Griffon reached up, grabbed the narrow mud-guard stay of

the starboard wheel. The black amphibian carefully dropped away.

For several seconds, the Griffon swung precariously. Then he got one knee over the curved mud-guard and drew himself up to where he could get a grip on the engine nacelle ventilation slit. From this point of vantage, he pulled himself up on the wing, then hung on with one arm as he moved toward the window of the cabin.

There was a light inside and he could see two rows of panic-stricken faces, all turned toward him. In the narrow aisle, a slim girl in official blue stared madly at the amazing masked figure outside the windows.

The Griffon grinned, realizing what a figure he made. He gripped the oblong window just aft of the pilot's cockpit, jammed his fingers into the slide spaces, and hung on.

The hostess came up, stared out with wild eyes.

"Open this slide!" the Griffon screamed.

Somehow, she managed to slide the window back. The Griffon slipped out of his parachute harness. Then he crawled through, wriggling and squirming. No sooner

was his head in than he caught the full force of the insane bedlam of terror of the passengers. The women were screaming. The men cringed.

"Who are you," they cried. "How—"

"Are they both dead?" demanded the Griffon. "I heard the shots—on my set."

"Both dead. He shot them in cold blood."

"I guessed it," the Griffon replied. Then he darted through the narrow companionway, peered into the control cockpit. The pilots *were* dead—the tops of their heads blown off. But the hands of one of them, stiffened in death, still grasped the wheel. A glance showed that the Sperry gyro still rode neutral and dead on the line.

He called to the girl. Together they lugged the first pilot into the aisle of the cabin. "Cover him over with some of those light blankets you carry," said the Griffon. Then he went back to the control pit and took over, pulling the lever that cut out the Sperry robot pilot. The Electra was slow on the controls as compared to the Black Bullet, but he soon caught on.

Outside he could see the riding lights of the Black Bullet. He flipped a signal to Pulski with his own riding lights and together they headed back toward Newark. He turned down toward Harrisburg, picked up the Newark-Bellefonte beam, and began to ride her in. The Black Bullet churned along above her. He realized

that the aerial for the speaking set had been broken by that high-wing monoplane, but he brought in the beam on the built-in antenna, threaded through the wings.

"What about Eddie?" the girl hostess asked, indicating the other pilot.

"Leave him here. He's all right. How about you—and those others in there?"

"I'm—I'm better now. They're all right. . . . But . . . but how did . . . did you get here? . . . Who are you?"

"I made a transfer," grinned the Griffon. "Never mind how. But tell me, who was that bird who crawled out of the hatch?"

"He's listed as Mr. Anton Valentier, a French-Canadian, I think, from Montreal. He killed Eddie and Hank—the pilots."

"What did he take?" demanded the Griffon. "He had a package of some sort. They took it off your antenna with a pick-up device."

"I don't know. We had a lot of registered stuff in the freight compartment. Valentier went into the lavatory and came out with a parachute outfit on. He made me unlock the freight compartment door. None of the passengers saw us as they were all facing forward. He picked out something—a box of some kind—and then raced up front when I ran to tell the pilots."

"Then he shot the pilots?"

"Yes. And after that he switched in the robot, ran back to the freight compartment and, I guess, climbed out of the hatch."

"He jumped—somewhere this side of Scranton. He had someone upstairs in a French Mureaux two-place fighter which carried no insignia or markings. We . . . that is—I'm the Griffon, miss. My partner up there, Pulski, is seeing that he doesn't come back. I'll get you back to Newark all right. But then I'll have to leave you—rather quietly. Understand?"

"The Griffon?" the girl whispered. "I've heard of you. But . . . but what are you going to do with us?" There was panic in her eyes.

"Just take you back to Newark—and silently 'scram,' as the boys say. You won't pull anything on me, will you?"

"Pull anything? . . . No—but please get us down safely. So much depends on it."

"About ten passengers' lives—and your job," the Griffon smiled through his mask. "Okay, then, it's a deal. I'll get you down, but you've got to let me get clear the minute we land."

The girl nodded. And as she did so the Griffon wondered what it was about her that seemed familiar to him.

"Not a word to anyone inside there, remember," added the Griffon.

"Oh, they hardly know what's happened. You know air travellers. I'll see that you get off—but what then?"

"You can tell them exactly what happened—after you get to the dispatcher's office. Here's my card."

And the Griffon flipped a white pasteboard out of his pocket and handed it to the girl. Across it in black script she read: "The Griffon."

Twenty minutes later, the Electra of trip No. 9 landed on a floodlit runway at Newark airport. But no one saw the pilot slip out of the cabin once he had run the ship well down the southeast side. They saw

nothing—until a black amphibian abruptly slipped out of nowhere and ran alongside. As quickly as it came, it raced away again.

JOHN SCOTT, head of the Secret Service department for the New York area, shuffled the sheaf of telegrams and letters piled in the middle of his desk.

"Well, are you going to call him?" he demanded of a seedy individual who sat opposite.

Drury Lang was a cop in plain clothes who was doing his best to avoid looking like John Law. But somehow he had never gotten over the blue shirt business, and the thick soles of his shoes simply creaked, "Cop . . . Cop . . . Cop." He sat with his feet sprawled out in front of him. He had probably shaved earlier in the day, but the gray stubble persisted. He was frowning. Lang always frowned when he was stumped.

"Look here, John," he finally said, gnawing the end off a lusty five center. "Why should we always have to call on that guy? He's beginning to get under my skin. Who the devil is he, anyway?"

"Kerry Keen? Why everything about him is in order, Lang. A young man-about-town sort of lad. Gay and yet highly intelligent. An expert on ballistics and the author of several volumes on the subject. All of which are 'musts' on the police school lists."

"Bah! That doesn't justify all the money he seems to have," Lang growled.

"But that place he has out at Long Island was left to him by a maiden aunt. His town place is something of an office. He's a specialist in his line, remember, and he's paid well for it."

"But I still think there's something screwy somewhere. Besides, why call him in on this mess. I'd like to handle this one myself."

"He did a nice job on that other affair at Newark," reminded Scott. "You must agree he helped you considerably—er, straightening out that clock business."

"Yeh, but we never cleared up that 'Pulski and Ginsberg' business. I still believe he knows something about that."

"Never mind that. Have him meet us at Newark Airport about noon."

THE hangar of the Amalgamated lay on the east side of the active Jersey airport. The line, one of the few independents, was offering a service hooking up many of the larger cities not on the main routes of the bigger lines. So far they had done well. But this affair, involving the loss of two crack pilots and launching unfavorable news stories, promised no good for the financial future of the line.

A sleek, black Dusenbergs rolled off Highway 28, turned into the airport, and purred up to the reception office of the Amalgamated Lines. John Scott hurried down the steps to greet the dapper gentleman who alighted.

He was fairly tall, athletic looking and neatly but expensively dressed in black—a black whose sombreness was relieved by a neat white pin stripe. He gave an order to his chauffeur, then reached out and gripped Scott's massive hand.

"Morning, John," he greeted with a crisp voice. "Hi, Lang! They've fixed you up with another beauty, I see—by the papers this morning."

"Where you bin for the last three days, Keen?" demanded Lang shoving up front.

"Oh . . . a bit of travel this time. . . . Toronto . . . no, I mean Montreal—the Montreal Police Department."

"You'd better get it straight, Keen," Lang warned.

"Ah, yes. You see, I gave my lecture 'Modern

(Continued on page 73)



Russia Clashes with Japan

DRAMATIC STORY BEHIND THIS MONTH'S COVER

By C. B. Mayshark

* * *

A NEWLY-ESTABLISHED Japanese air base in the Nippon-controlled area of Manchuria is suddenly startled into great activity. A distant purr of motors has been heard, and in a moment the purr becomes a roar—not the staccato roar of a single, hurtling ship, but the slurred thundering of a dozen or more. The unscheduled racket means but one thing: Attack from the air!

In a moment the foremost ship of the raiding flight plunges into view. A Japanese observer on a tower excitedly jots some characters and figures on a slip of paper. Then he grabs his phone.

"Commanding officer? Tower observer speaking. Russian reconnaissance planes leading bombing attack. Objective—either flying field or naval vessels in outer harbor. Planes at about four thousand feet. That's all, sir."

Suddenly the telegraph instruments in the communications room crackle to life, while three or four radio operators get busy at the dials. In two or three minutes every Japanese commanding officer in the area is advised of the Russian air offensive.

IN just such a manner as we have portrayed above, the Far East may at any time be plunged into war. But we hasten to say that our imaginative clash is the *second* act and not the first act of the drama. Initially, there would probably be some detonating altercation at the border in which each party would be as much to blame as the other. Diplomatic relations between Japan and Russia has, in recent months, been considerably strained. With these two powers rubbing each other the wrong way, some slight misunderstanding at the frontier might set off the powder keg. The territorial controversy is so entangled that either might be the aggressor. In short, our scene above might just as likely find Japanese planes raiding a Russian base as vice versa; for by that time, the trouble will have already begun.

In the meantime, we can only hope that relations between the two countries may improve to a point where such a war may be sidestepped.

The last "official disagreement" between Japan and Russia occurred in 1904-05. Before the entanglement, numerous diplomatic conversations took place, the main discussion revolving about the vast stretches of land to the North of China. Eventually, however, relations were severed and war declared.

And now history may repeat itself. Whereas there has as yet been no severance of relations, it is the belief in many quarters that the patience of officials of both governments has already been taxed to the breaking point.

But a new Russo-Japanese war would be different from the last one. With the turn of the century, mechanized warfare had just come into its own and the 1904-05 Far Eastern conflict was a prime example of the new mode. But that war will seem like a practice maneuver alongside of a Far East war 1936 style. To be sure, there were several large scale battles in the last entanglement and many thousands of lives were

lost. But what is the annihilation of a body of troops trained in the business of war against the possible butchering of a huge civil population?

The 1904-1905 war was, in the main, a series of naval engagements. Actually, the decisive battles took place on land; but it was the Japanese navy, adroitly handled, which assured success for the Land of the Rising Sun. Russia, too, had plenty of strength on the sea, but she couldn't cope with the masterful tactics of the Japanese commanders who were navigating in waters close to home. The Russian fleet as well as her troops were too far away from Moscow to move intelligently and cooperatively. And so Japan won the war.

Peace ensued for a number of years, but now once more the old story springs into the headlines. Japan needs to expand. And she may encroach upon Russian sovereignty in doing it. And Russia, quite naturally, balks. What will be the outcome? Will there be war? Very likely Japan has become nervous over the manner in which the League of Nations has launched sanctions upon Italy. Maybe both she and Russia will think twice before going to war in earnest. Effective sanctions would certainly cripple Japan in short order. True, Japan is no longer a member of the League, but sanctions could still be imposed.

Now let us consider such a 1936 Far East conflict. Russia is not so far away as she was in 1904. The mileage is the same, of course, but the transportation time is vastly less. Russia's main difficulty in 1904 was in transporting troops and material with only one railroad line. Today facilities are better, but that is only part of the story. The air aspect will be the most important feature in a new war.

With the fast, mammoth ships of the air recently built by Russia, men and materials could be transported across the wastes of Siberia with a speed that would make the rail trip of 1904 look silly. But the transportation problem is only one angle which would be solved by airplanes. The important offensive and defensive gestures would be carried out by means of aircraft—not only on the part of Russia, but Japan, as well.

AND now let us return to our raid. As the Russians attack, a flight of seaplanes quickly takes off from a nearby base and rushes into the fray. On our cover, we show one of these craft intercepting a Russian plane. What will be the outcome? We can't tell. It is hard to say which of two military planes will be victorious in an air battle which has never been fought and which may never come to pass.

But this much we do know: A new war in the Far East will be a veritable hell on earth. And that hell, ironically enough, will come from the direction of heaven—via the air lanes.

The Russian plane is an R-5 biplane powered with a 650 h.p. M-17 (Russian built B.M.W.) motor. The ship is equipped with two Lewis and two Vickers guns. The Japanese ship is a Kawanishi 90 reconnaissance seaplane powered with a 450 h.p. Japanese-made "Jupiter."

Ackemma Ace

Mechanics Belonged
on the Ground,
But In This Case—

FIGHT? There isn't a *real* Ace in the whole Squadron!"

Private Peter Tompson, mechanic in the 17th Pursuit Squadron, A.E.F., paused in the act of lifting a glass of beer to his lips and listened in amazement. Top Sergeant Hendry, mellow after his two or three quarts of beer, leaned back against the bar of the little estaminet in Ourcy and continued to air his opinion of the pilots in his outfit.

"They're just a bunch of bluffers. The C.O.'s been tearing his shirt because things have been going haywire on some of the ships—says my mechanics don't know there's a war on. If his shave-tails knew how to fly, those old crates wouldn't be breaking down so often. I think his flyers crack up those ships just so they won't have to fly patrol. There isn't a real flyer or fighter in the bunch. Now take the 8th Pursuit—the outfit I was with before I was transferred. There were fighters for you! And flyers, too! Hard-boiled, all of them. Why, one time the Major had to fly back to Metz. He'd been tight as a boiled owl the night before and he needed sleep. He says to me: 'Hendry, you come along with me and after we get a few thousand feet of altitude you take the controls—I'm going to catch a little shut eye.' He did, too, went sound asleep and left me to fly the blasted ship alone. I'd never flown before—but there's nothing to it. I've handled the stick several times since and I'm going to try to be a pilot when I get a chance."

He let another half pint of beer slide down his throat, then continued:

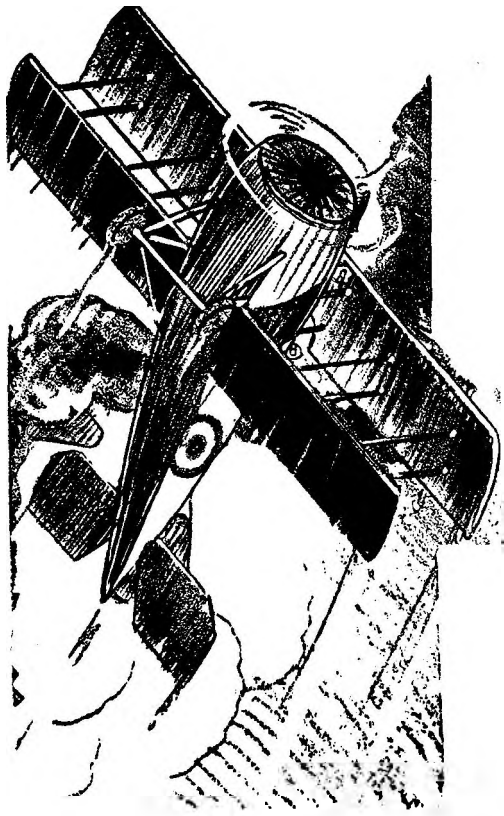
"Look at Lieutenant Barington. He's too polite and sissyfied to suit me. He's no fighter. He came in from early patrol this morning with eight or nine bullet holes in his center section and says three Huns jumped him and he fought them for fifteen minutes and got one of them. No one saw him down one, did they? You know what I think? That he just took his pistol and drilled those holes himself so's he could brag about the desperate fight—that he didn't have."

"You lie!"

The noisy, crowded room suddenly grew quiet as everyone stared in astonishment at the shy, homely little mechanic who so rarely said a word. Peter, himself, was a little surprised at his own outburst.

"What's that?" growled Hendry, disbelievingly; "what'd you say?"

Peter, his bowlegged little figure scarcely reaching



As Lieutenant Barington cleared the edge of the field, there came the grating sound of ripping fabric. The Spad's motor sputtered and the ship fell off in a sickening side-slip.

Peter Tompson always got licked when fists were flying. But he still figured he had "what it took," so he got into the Big Brawl to prove it—only to end up on the grease monkey squad far behind the Front. Here, fists still flew, and Peter still got licked—but there finally came a day when an old Salmson flew instead of fists!

up to Hendry's shoulder, faced him squarely.

"You know that isn't so," he replied doggedly. "It isn't the pilots' fault that some of the ships have cracked up. They're all good fighters and Lieutenant Barington is good, too. Anyone who says different lies!"

With a snarl, Hendry leaped at him, but even in his anger the difference in their size caused him to shove Tompson instead of hitting him. His big beefy hand slapped against the side of Tompson's face and shoved him against the wall with a crash. Again the little mechanic surprised everyone in the room, including himself. He bounded back, sprang straight for the Sergeant's face, both fists flying. Before the startled giant could protect himself, one fist had glanced off his cheek bone, breaking the skin and starting it to bleed. With a bellow, Hendry swung back with a left straight toward the wildly punching little fighter. Tompson crashed to the floor, one eye closing rapidly, his legs numb and unresponsive. A deafening roar blasted in his ears.

SOME TIME later, Peter walked slowly back through the dark to his quarters, his head throbbing painfully at every step. He was still angry at the recollection of Hendry's sneering remarks about Lieutenant Barington. The Sergeant shouldn't have talked like that. Lieutenant Barington was different—a really good flyer and a brave fighter. And he always had a cigarette and time for a bit of gossip with his mechanics, instead of ordering them about, and treating them like dogs, as some of the other pilots did. Weak and sore as he was, Peter was still glad that he had behaved that way in the estaminet. No one would tell lies about the Lieutenant while he was around, even if he was only a little runt and always got licked in a fight.

But Peter was discouraged about being licked. He had been beaten again tonight, just as he always lost in every fist fight. True, every one he had ever fought had been bigger and stronger than himself, but that didn't count. Somehow, when the war broke out and

GRIPPING YARN OF THE WORLD WAR

By Halsey R. Shields

he had enlisted, he had thought that things would be different—that now he would fight and kill or capture some of those big Huns. But here he was, miles from the front, as safe as though he were back in a factory in the U.S.A. He was disappointed about the war. It was not at all what he had hoped for.

Dawn the next morning was drear and foggy. Drops of moisture glistened on the wings of the Spads lined up in front of the hangars and the wind-sock hung limp and bedraggled from its pole. The mechanics of the 17th lighted damp cigarettes, made profane remarks about the war, the Air Service, and the early hours they were required to observe.

Peter, sitting in the cockpit of Lieutenant Barington's Spad, warmed up the motor slowly and carefully, listening to the crescendo thunder of the mechanism with approval. A sweet motor and a sweet ship, he thought. Every time the Lieutenant came back from a flight he checked over and over again every part of the delicate machine entrusted to his care, trusting nothing of importance to his assistant. He frowned a little as he thought of his new helper.

Ever since the flight had been organized four months previous, Peter had done all the work on the ship. For a time it seemed as though bad luck had been wished on the Squadron—a regular jinx, it was. Ships went up and didn't come back, and later news trickled back that they had had a forced landing in Germany. Gas lines plugged up mysteriously and wheels and landing gear folded up under the slightest strain.

It had seemed as if someone or something had hoodooed the outfit. The C.O. had raised merry hell about it, though. Sergeant Hendry, in charge of and responsible for all mechanical work done on the ships, drove his men night and day in order to bring the equipment to as near perfection as possible and thus put a stop to the numerous accidents and breakdowns which were demoralizing the Squadron.

Much as Peter hated Sergeant Hendry he had to admit that he was a good non-com. A splendid mechanic, he could find and repair any mechanical trouble with unerring accuracy. Six feet three and a fighter, he maintained strict discipline and kept his ground crew drilled to a state of high efficiency. Stern as he was, he was well liked by the crew for he was fond of an evening of drinking beer with the men, roaring out songs, and telling stories punctuated by his stentorous laughter.

There had been a marked lessening of breakdowns recently and Peter had heard the C.O. telling Hendry to keep up the good work.

But then Peter thought again of his new assistant, Carlson. He frowned, whistled tunelessly to himself. He really didn't know what to make of Carlson. He was a darn poor mechanic, that was certain. If they were turning them out like that now, the Air Service sure had gone to the bow-bows. As a matter of fact, Carlson admitted that he had attended training school only a few days when Peter queried him about the new type Hisso motor. So Peter kept him busy doing unimpor-

tant little things. Peter continued to inspect and service the ship himself.

A group of pilots came out of the mess hall and scattered toward their respective ships. Sergeant Hendry fell in step with Lieutenant Barington and walked over to his plane with him.

"Morning, Tompson," said the Lieutenant, pulling his helmet over his blond head: "Ye gods! What have you been doing to that eye of yours, man? Lose an argument with a motorcycle or did one of these wooden-shoed maidens get you down and kick you? Better stay in of nights, eh, Sergeant?"

"Yes, sir," answered Hendry; "Tompson, did you put those new flying wires on this ship as I told you?"

"Yesterday," replied Peter shortly; "the ship's in perfect shape."

"How's the new man doing?" the Lieutenant asked Peter in a low tone as he watched Carlson wiping some oil off the cowling.

"He's not too hot, sir," replied Peter slowly. "He hasn't had much experience—"

A snort from Sergeant Hendry, who had been examining the motor, interrupted him.

"You, Tompson," he snapped; "Come here. What kind of work do you call this? Blast you, you know better!"

He was pointing to the two lower spark plugs on the Hisso. The high tension wires leading to them should have been safely fastened down with brass wire. Instead, the safety wire was dangling from the cables.

Peter stared at the wires in utter astonishment. "Why, why I don't understand it," he stammered. "I checked over the whole ship last night and I'm sure those wires were fastened." He turned to Lieutenant Barington. "Sir, I'm sure of it!"

His helper had stopped wiping and was listening to the group around the nose of the ship.

"You, Carlson," Peter demanded; "have you been doing anything to this motor? I told you to keep your hands off and not make one single change or adjustment. Have you been fooling with those plugs?"

"I haven't touched them," Carlson retorted sullenly. "Were those wires unfastened when you last looked at them?" snapped Hendry.

Carlson hesitated a moment. "I didn't notice," he finally admitted.

"Well, Lieutenant Barington, it looks like I'll have to give your detail a shakeup," began Hendry officiously. "I'll transfer Tompson—"

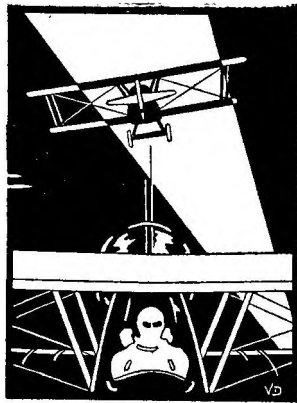
"Don't bother, Sergeant," cut in the Lieutenant firmly. "I want Tompson to stay with me. It probably wasn't his fault about those wires. Everything okay now, Tompson? All right, prop her. Switch off, gas on. Contact!"

When the thunder of the Hisso had died away in the distant sky, Hendry turned to the two mechanics.

"Look here, you two birds," he said threateningly; "I'm going to watch you from now on—and at the first sign of any more slackness like this I'm going to break both of you. I'll put you to work shoveling mud with the road gang. Snap out of it and watch your step."

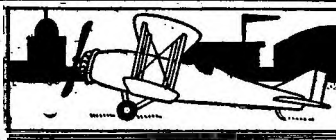
THE mechanics pattered around the hangars, cleaning their tools and waiting for the return of the patrol when would ensue a period of feverish activity. Scarcely before the ships rolled to a stop, the "greaseballs" would swarm over them, inspecting and gassing

(Continued on page 85)



HAPPY LANDINGS

BY ARCH WHITEHOUSE



Pan American Carries Our Frontier Westward

New problems of defense arise now that trans-Pacific air line stations have been built thousands of miles from our country's mainland. The situation leaves us open to a lot of trouble. So states Mr.

Whitehouse, who in this department is given free rein to express his personal views on various phases of aviation.



PAN AMERICAN AIRWAYS has done a remarkable job in linking the North American continent with the Orient. To China in three days! That makes Jules Verne a complete back number. There is no doubt that this is the most impressive step forward in communications and travel the world has even seen. From the point of view of actual mileage over water, the Pan American effort is probably the greatest organized transport venture in history.

Any attempt to compute the actual cost of all this would be impossible to any one outside the business offices of Pan American. The small bases at Midway and Wake Islands cost over \$2,000,000 in themselves. What the Clipper ships and the extra base equipment at San Francisco, Honolulu, Guam, Manila have run into must be a staggering figure. And there'll be another outlay for the base at Macao, on the Chinese mainland.

Several round-trip mail flights have already been made, but at this writing, no passengers have yet been carried. We understand that Pan American already has over 800 applicants for Clipper-ship passage to China.

It's been a magnificent job, splendidly carried out and an honor to American aviation. For the first time in years, the American public is really beginning to feel a sense of security in aviation. We predict that the coming Spring and Summer will see one of the greatest air transport seasons ever jotted down on the log books of our companies. And if the Pan American Clippers open up a full schedule this summer, you can bet your last penny that by the summer of 1937 you will be able to fly to London on scheduled flights over a British-American route run jointly by Pan America and the Imperial Airways—flying American-built Clipper ships. The European connections and trunk lines through to Africa and India will be carried out by machines of the Imperial Airways.

Many of you who read these lines may one day be fortunate enough to take one of these trans-oceanic air journeys. But there is another, and a more serious, side to it.

What happens to Pan American's air bases in the Pacific in event of war?

Who is responsible for their defense, assuming that Japan may carry out a plan for complete domination of the Oriental Pacific?

Can the newly established state of the Philippines

assure Pan American Airways complete security against possible political changes in its government?

Should the Philippine government decide to place itself under the protection of Japan or Great Britain, just what security will be offered American investors in Pan American Airways?

IN other words, the American frontier has been carried on the wings of Pan American to points far distant from the American mainland, and the whole national defense set-up has had a new problem dropped in its lap.

Guam is 1,500 miles east of Manila, or about 6,500 miles from San Francisco. Wake Island lies about 5,000 miles away, Midway is approximately 3,750 miles away, and Hawaii is 2,410 miles from 'Frisco. It does seem that the new Philippine independence came at a very unfortunate time, considering the efforts of Pan American. Japan, it must be remarked, is within easy striking distance of Midway, Wake, Guam, and Manila. Macao, though Portuguese controlled, is in China, and anything in China—well, we'll skip that.

Conflict in the Pacific would completely halt all air traffic; for no air line today is any stronger than its ground staff and its ground equipment. It would be impossible to maintain regular schedules across the Pacific without the aid of the Pacific Ocean stations.

Thus, to maintain these trans-oceanic air connections against such threats, the United States would have to establish a new system of defense for these far-flung outposts of the new frontier. The island bases could be fortified and garrisoned and all might be connected up with a means of inter-island communication—but the fortifications would have to be of a strength and self-sufficiency capable of holding off an attack until such time as the U.S. Navy could render assistance. And the San Diego naval base is approximately 6,500 miles from Guam!

The only defense that can work fast enough to even promise a reasonable amount of protection for these bases, is an air-arm capable of moving at high speed, over vast mileage, and in many directions.

A number of years ago, I got a deep throated razz from a number of readers when I made a statement to the effect that the air pilot who had experience on large flying boats would one day become the most important figure in American military aviation. My readers were

still living over the Spad and Fokker D-7 days. But the moment the war ended, I wished I had been trained on Handley-Pages instead of Camels. Today, I'd rather be Edwin C. Musick, chief pilot of the *China Clipper*, than the greatest single-seater pilot the war ever saw.

The future of the American military pilot is being welded by the men in the Clipper ships. The first line of defense will be held by the gunners aboard giant battle-planes—aerial destroyers of the flying boat type. A number of winged gnats off the carrier decks will be mixed up in it somewhere, but they

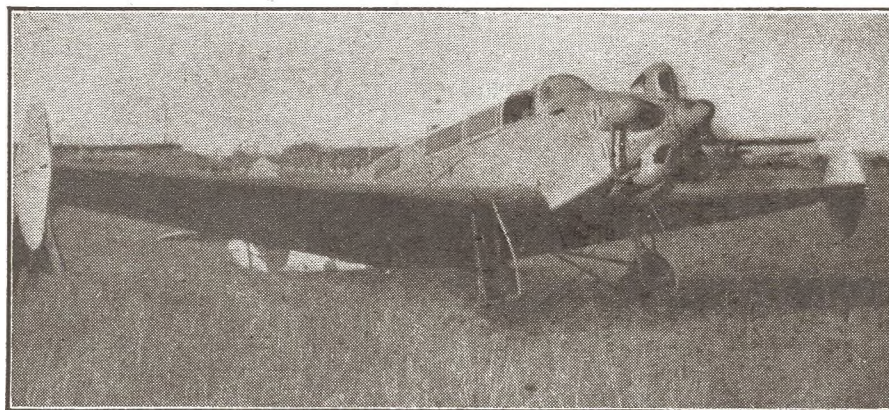
will probably be used as bait and sacrificed to the guns of the enemy cruisers while the battle-plane fleet comes up and delivers the great smash.

Military experts, writing in national journals and newspapers, have stated that the arrival of far-flung transoceanic air lines plus their bases so necessary for successful routes, has placed America in much the same position that Great Britain has had to face for years. The British Empire has possessions in every corner of the globe and naval bases at strategic points, and now she is building new air bases to augment and speed up these defenses to

hold open the channels of trade and communications. Many of these bases and many of her protectorates and mandates Great Britain would like to drop and be relieved of but her possessions require and demand that they be maintained.

Prior to the coming of the transoceanic air lines, the United States was free of these incumbrances. She was a self-sufficient nation with enough natural resources to maintain independence from the rest of the world. This point works out in theory, of course, but in actual fact it is hardly
(Continued on page 80)

Used in many of the subsidized air clubs of the Soviet, this interesting light plane—a cabin job with sliding coupe top—was designed at the Leningrad Institute of the Civil Air Fleet. Note the wing-tip rudders, usually found only on tailless type ships. The idea, in all probability, is to prevent sideslipping, should the pupil make too sharp a turn at low speed.



✱ ✱ ✱

Let's get going on this sport flying proposition! We grant that opposition to low-powered craft is still in evidence—but the majority of the facts are all in favor of the man who wants to fly. Here's the story. And here, too, is a top-notch club plan.

✱ ✱ ✱

On the Light Plane Tarmac

✱ ✱ ✱

AMERICA, which gave the world the first powered plane, stands at the brink of a new aeronautical era. But the question is: How much time are we going to waste in just standing at the brink?

Military aviation? Commercial aviation? Gliding? Oh, yes, America is Okay on these scores! Today, our military aviation is on a par with any in the world, if not in strength of numbers, most certainly in the quality of equipment and training. Our commercial aviation leads the world in mileage and speed. And during the past few years, our glider enthusiasts have proved they can put on a show comparable to any staged in Europe.

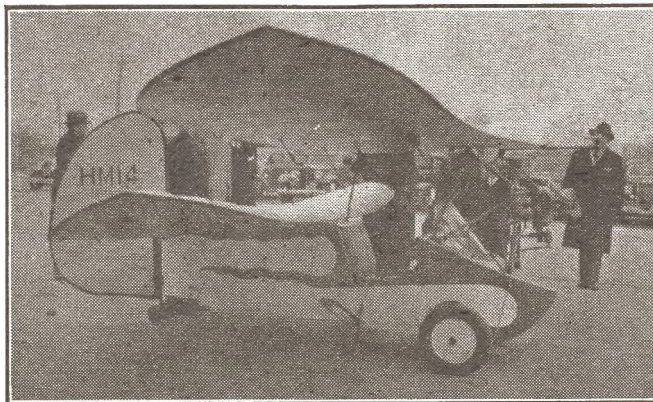
But, sad to relate, in the light plane game we've not kept stride with our neighbors across the Atlantic. We, of FLYING ACES, are going to find out why! That's the brink. When do we start moving?

They used to tell us that it was the stringent regulations by the Department of Commerce that were holding us back, but the light plane

fans of France, Germany, and Britain were under rules just as strict, if not stricter—and they found time to develop light planes and organize flying clubs.

Then there was the old cry of government subsidy. Many European nations, they said, were enjoying such backing, while the American sportsman pilot was paying for his flying—through the nose. But this barrier has been removed; for Gene Vidal, Director of Civil Aviation, has wangled \$100,000 out of the government for the development of a suitable light plane.

The great drawback to light plane flying in this country was the fact that initially flying enthusiasts here didn't want light planes. They wanted high speed, high powered and hair-raising performance. Those who would have been satisfied with real light planes ran into the old license wall. They tried to build their own ships and power them with hopeless adaptations of light car motors or motorcycle engines. Incidentally, this same situation cropped up in the
(Continued on page 89)



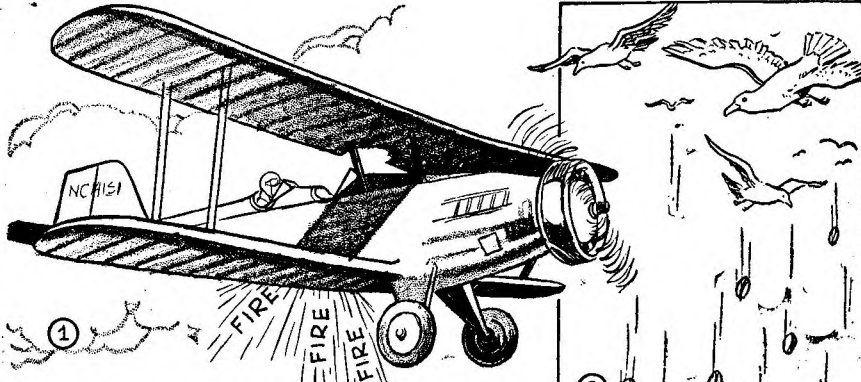
Yes, the "Flying Flea" has come to America! You'll recall that our December number described this astounding little job that's so popular on the Other Side. This one, powered by a 20 h.p. Anzani, has been on display at Floyd Bennett Airport, New York City. As indicated by the HM14 on the tail, it's the fourteenth modification of Designer Henri Mignet's line.

Here and There in the Air

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

PILOTOPICS

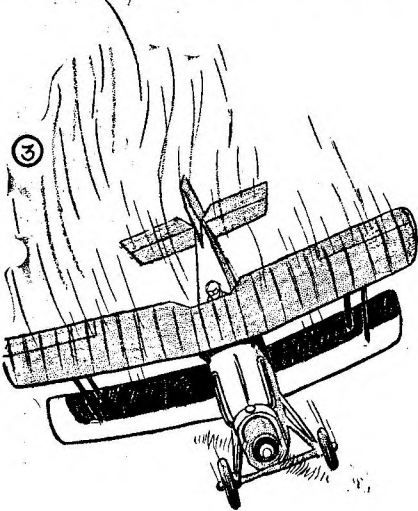
By ROY HUMPHRIES



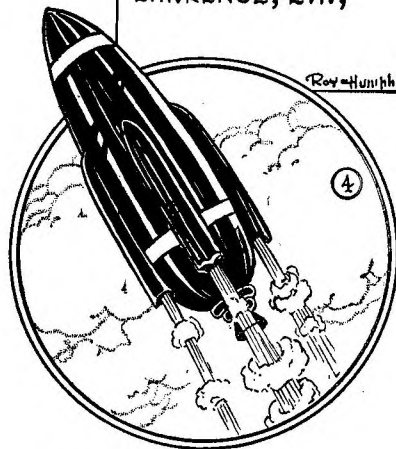
1 AIRPLANE WITH AMPLIFYING EQUIPMENT SPREADS FIRE ALARM . . .



2 SEAGULLS BOMBARD PEDESTRIANS WITH CLAMS NEAR LAWRENCE, L. I.,



3 MAJOR BYRON Q. JONES WAS THE FIRST MAN TO PUT A PLANE INTO A TAIL SPIN TO LEARN HOW TO COME OUT OF IT . . .



4 AUSTRIAN SENDS AIRMAIL BY ROCKET . . .

Monarch Features, N. Y. C.

Stories Back of the Above Pictures

1—The newest thing in fire alarms was recently—and unexpectedly—demonstrated at Batavia, N. Y., when a voice from the sky, crying "Fire, Fire," awakened the residents. A pilot flying in the vicinity saw a burning building and broadcast the alarm from an amplifier on his ship.

2—Birds are generally called "our feathered friends," but seagulls at Lawrence, L. I., N. Y., are listed among the enemies. These birds fly high over a bridge there and drop clams upon it—in order to break the shells of the bivalves so that they can get at the edible part. Several persons crossing the bridge have been hit by the "bombs."

3—Major Jones was the first Army flyer to perform acrobatics in the air. In the winter of 1914-1915, when flying was comparatively in its infancy, and no parachutes were available, the Major practiced putting his plane into a tail spin just to learn how to come out of such a situation—alive.

4—On February 2, 1931, Frederick Schmiedl of Gras, Austria, shot his famous V-7 rocket from Schoeckl to Radegund, a distance of one and three-quarters miles. It bore 102 pieces of mail, and it got there safely, not to mention rapidly.

CRASH TRUCK GOES SWIMMING

BEFORE reporting for duty at Wheeler Field, California, a brand-new "crash truck" took a three thousand dollar swim in San Francisco harbor. The combination fire-police-ambulance-emergency wagon was sailing gaily through the air in the sling of an Army transport's hoist when the latter broke, and down, down into the briny went the gleaming red vehicle. It cost just three thousand bucks to bring it out and revive it for duty!

The truck was made by the Army at the Holabird Quartermaster Depot, Baltimore, Maryland. Costing \$7,500 to build, it embodies the results of research and experiment on the part of Air Corps and Quartermaster engineers over a period of years. Powered with an eight-cylinder, 160 horsepower Lycoming motor, it is capable of rushing to a crash or other emergency at fifty-five m.p.h. over almost any kind of ground. Beside standard emergency equipment, it carries for fire fighting, four fifty-pound carbon dioxide cylinders, a five hundred gallon water tank, a Foamite container and automatic mixer, a booster pumper capable of throwing 135 gallons per minute, and an intriguing assortment of hand extinguishers, hooks, axes, hacksaws, bolt and wire cutters.

ERROR IN THE AIR

YOU don't know the whole story until you hear all the words. That was the lesson learned by Corporal H. W. Fisher the other day.

Fisher was a passenger when Sergeant George E. Layman took off from Middletown, N. Y., for a flight to Mitchel Field, L. I. Over New Jersey, a heavy layer of fog was encountered, so at a word from Layman, Fisher bailed out. Later, he made his way into Flemington, N. J., and caused an alarm to be sent out for the lost plane bearing Sergeant Layman.

But over at Mitchel Field, Sergeant Layman landed without difficulty—and suddenly found that his passenger was missing!

It was all a misunderstanding. What Layman actually said over his shoulder to Fisher was, "If this gets any worse, you may have to bail out." But Fisher only heard the last two words!

CLOSE CALL!

THE Scouting Force's VS Squadron Nine recently reported an incident which they feel "rates" Ripley's "Believe It Or Not." Chief Carpenter's Mate Nooney, while pushing on the forward poontoon strut of a plane about to be put over the side, had his hand slip off the strut when the plane

lurched sideways. Nooney fell forward and the propeller neatly clipped the C.P.O. badge off the peak of his cap and tossed it up on the hangar roof. Until someone can better this, Nooney claims the "close call" record.

SUDDEN FLIGHT

A NAVY flight mechanic recently took a six-foot hop that wasn't covered by flying orders. While towing a plane into the hangar during an electrical storm, Seaman Moore received a sudden charge of static juice that sent him spinning. The ground lead, an ordinary trailing chain similar to those carried on gasoline trucks, bounced from the ground just as the instant lightning flashed nearby. Moore served as the ground lead—and he didn't like it a bit!

The Air Corps *News Letter* recently

stated that these trailing chains have been recommended for adoption by all Naval squadrons. Pan American Airways planes are now grounded with ball-and-chain leads similar to the weights used to "anchor" horses.

THOSE long suffering people who are charged with the care and upkeep of landing fields may gain some consolation, according to the Navy Department Press Section, from the following story about landing fields in French Indo-China. It seems that one of the pilots from the Navy's *Augusta*, visiting in that part of the world, wanted to make a flight on the French airline from Bangkok to Angkor Vat, the world famous ruins in Cambodia. But upon inquiry at the line's office he was told that due to the fact that the rainy season was not completely over, the field

at Angkor was still under water. Upon suggestion that the end of the rainy season was near at hand and that the field might dry out shortly the following answer was given: "When the field dries out we have to clear the jungle from it again."

U. S. S. LANGLEY GROWS WHISKERS

UPON entering drydock at Mare Island recently, the *U. S. S. Langley* was found to be sporting a set of grass whiskers that would make Santa Claus envious. It was all a mystery—until someone noted that a dredge had been working alongside the ship while it had been moored at the sea dock. It was decided that the dredge's continuous stirring of the mud had brought about the hirsute phenomenon.

The New Airmail Pals

GATHER around, all you letter scribblers, the Airmail Pals are again in session. And what a pile of letters we've got heaped here in front of us! At the close of this meeting, we're going to dump them into the mail box—and before long hundreds of aero fans will be reaching across the great distances traversed by the mails to shake hands, figuratively speaking, with new-found friends.

But first off, scribes, let's take care of a few items of business. For one thing, we think that the new system has been underway long enough now to check up and see how it's going. In short, we'd like some of you to write in and tell us about your mail experiences with FLYING ACES pals. We'll mention the really interesting incidents in this department. Perhaps some of you have done some traveling and met your writing pals, or maybe you've made some great model plan "swaps," or found out that you know some people that your new pal knows. Anyhow, let's hear from you.

Incidentally, when you write us what kind of a pal you seek, try to be as *general* as possible and not too specific. You see, it's very hard for us to find a pal with red hair, exactly 5 ft. 6 in. tall, who lives in Whoopla, Idaho, builds only stick models, and plays B-flat harmonica. Oh, of course it isn't that bad—but some of you pals do give us some hard ones to fill.

A fellow in New Jersey wanted a pal who was interested in pigeons and lived near him. We could have given him a pal who lived near him—but just now we have no pigeon fanciers on our list. Hence, we felt that the best thing to do was give him a correspondent interested in collecting things. Then they could both learn something from the other. But anyhow we'll try our best to fill your wants. Maybe we'll miss by a mile on occasion—but you're sure of getting a good pal out of it, anyway.

Another thing: How would you like an airmail pal grab bag? A lot of fans have written in to say that there's a lot of fun and mystery in not knowing what their new pal will be like. So here's what we'll do: All the letters you send us addressed to The New Airmail Pals Grab Bag will be dumped into a big gunny sack. Then, at the end of each month, we'll shake them up, reach in, and pair 'em off. And to make it even more interesting, we're going to give FLYING ACES Aviator's Identification Bracelets to each airmail pal of the 13th pair pulled from the bag! The 13th was

chosen to make it more lucky. Of course, only those letters addressed to the grab bag will be handled in this way. The other airmail pal letters will be cared for in the usual way.

Among the interesting letters received this month was one from Eric Travis, one of our English readers. Eric goes in for trick photography. He sent along a couple of fine "shots." One shows him carrying his own head under his arm and another has him flying through the clouds on a magic carpet. The pal we got him in Pennsylvania got these remarkable photos.

Another fellow wrote in—Charles M. Shultz, of Columbus, Ohio—and told how he'd already made a total of 256 different airplane models! We'd say that that's going some! Kurt A. Ilgen, of St. Louis, Mo., got Charley for a pal, because Kurt happened to be looking for someone who could give him pointers on model building.

Well, space is getting short, so we'll have to sign off. But before we do, we want all foreign pals and all those wanting foreign correspondents to read the section titled, *Regarding Foreign Pals*, in the box below. And read it *carefully*, for it's very important.

And now, so long, all you writers. Look for us again here next month.

HOW TO GET AN AIRMAIL PAL

FIRST, write a letter just as if you were writing to your new Pal—the kind of a letter which tells your age, your particular interests in aviation, your hobbies, a *general* idea of what kind of a correspondent you seek, et cetera. Then, send this letter to Airmail Pals, care FLYING ACES, 67 W. 44th St., New York City. And be sure to enclose a stamped, self-addressed envelope.

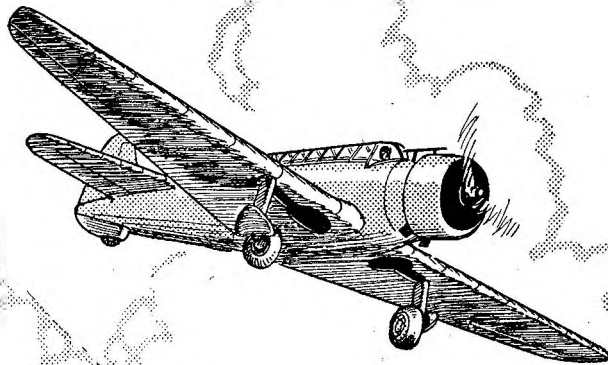
Now, when your letter arrives, we select a Pal for you from our batch of letters—the sort of Airmail Pal your letter indicates you want—and we mail *his* letter to you in the stamped envelope you send us, and we mail *your* letter to him. Then you're all set! Of course, if you want additional Pals, just write us again.

REGARDING FOREIGN PEN PALS

IN case you do not reside in the United States, write a pen pal letter as above—but do not enclose a stamped, self-addressed envelope or send any money for stamps. 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. Simply send us a stamped, self-addressed envelope with a note to this department stating that you wish a foreign correspondent. A foreign writer's letter will be returned to you in the envelope you send us—whereupon you may begin writing to him direct from your own home. The 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.

Modern Planes Album



VULTEE BOMBER

THE VULTEE BOMBER

THIS neat low-wing monoplane, manufactured by the Airplane Development Corporation of Glendale, Calif., is listed as the Vultee V-1A. It has been built with one eye on the export market—presumably the Orient. Whether any will be accepted for the U. S. air services is a question.

The machine is an attack-bomber

capable of long-distance flights at high speed. With the Wright Cyclone SR-1820-F53 engine, she has a top speed of 250 m.p.h. With the SR-1820-F52 motor the ship will cover 2,700 miles at 192 m.p.h. carrying a 1,100 lb. bomb.

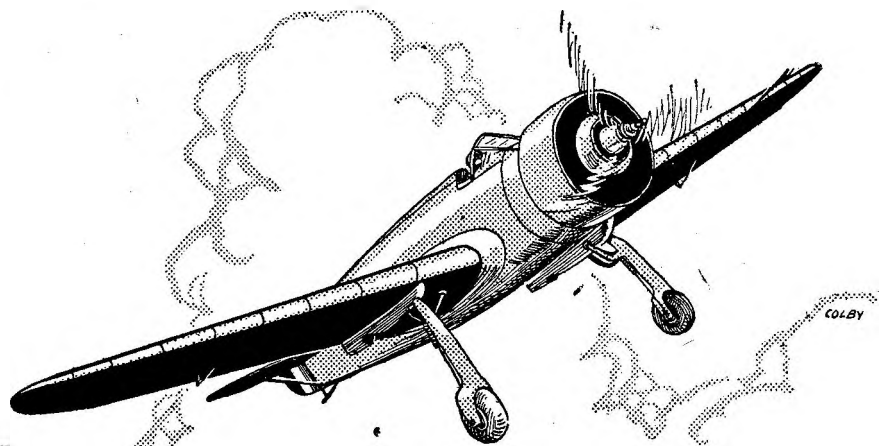
An interesting feature of the design is the typical German tail unit, so familiar to those who know the present day Nazi service craft. The tail-plane and elevator are placed high on the back of the fuselage,

ITALIAN BREDA 64

INTEREST runs high where Italian fighting equipment is concerned. This new "assault" machine, designed for the Italian Air Force, will come as something of a surprise to many of our readers. In general, the Italian Air Force has not gone in heavily for single-seat fighters, having developed high-speed flying boats and long-distance high-altitude bombers.

The Breda 64, as it is listed by the builders—the Societa Italiana Ernesto Breda, of Milan, is a low-wing designed somewhat on the same plan as the Breda 27, which has been shown in this magazine before. It is a single-seat fighter fitted with the Alfa Romeo Mercurious IV engine—a radial that turns out 640 h.p. An interesting point is that this plant is the Italian-built British Bristol Mercury engine. What a twist of fate!

The machine is fitted with four Breda-Safat 7.7-cal. guns, two firing through the airscrew and two set outside the airscrew arc in streamlined boxes under the wings. The undercarriage, which retracts, is



BREDA 64

composed of two independent legs which fold back into the wing.

Top speed of this machine is listed (unofficially) as 254 m.p.h. The craft is designed to carry out low attack "shows" on personnel and material with machine guns and light bombs. It is also expected to do its part as a fighter in the air; and the pilot seems to have an enviable position, well up above the thick section of the wing. We presume that

forward of the rudder. It is an all-metal, low-wing monoplane with a cantilever wing. The wheels fold away into the roots of the wing during flight. The wing is covered with stressed metal and carries flaps.

The outstanding feature of the fuselage is the long cockpit which accommodates the pilot and observer under a glass cowl. In action, the pilot releases the bombs and sits just aft of the leading edge of the wing. He has four 30-cal. Browning MG-40 guns fitted within the inboard leading edge of the outer wing panels—two guns in each wing. The observer has one 30-cal. Browning gun. The fixed guns are manually loaded and electrically fired from a pistol-grip trigger mounted on the control column. Stainless-steel ammunition boxes carry 600 rounds for each gun.

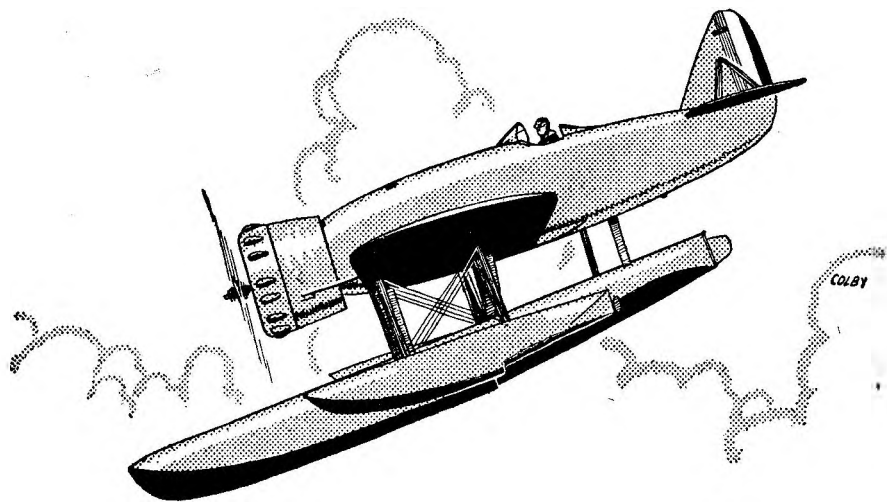
The bombs are carried both internally and externally. Racks are provided in the fuselage and wing for twenty 30-lb. bombs. The inside racks are deep enough to accommodate either chemical or fragmentation bombs. Ten 120-lb. bombs are carried under the center wing panel in two groups of five. A special shackle is also available for a 1,000-lb. bomb.

the wings are metal covered over wooden spars and ribs. The body is made of metal tubing over which metal panels are fitted.

The motor carries a three-blade adjustable-pitch airscrew and other equipment includes a Garelli compressed-air starter, a Vickers-Potts oil cooler, two-way radio set, air camera, a Salvatore dorsal-parachute, and automatic fire extinguisher.

A NEW BATCH OF SKY BATTLERS!

On the test tarmacs of the World's leading air powers, increasingly-formidable fighters are ever being groomed. These are among them—Our own Vultee Bomber designed for the export trade; Italy's new "Assault" plane; France's unique seaplane fighter; and Britain's new Hawker.



FRENCH LOIRE 21

THE French designers startled Europe recently with the new Loire 21, low-wing monoplane, which is listed as a fleet fighter seaplane. Probably nothing quite like this ship has come out in recent years. The interesting point about it to American readers is the power

LOIRE 21

plant—the new 750 h.p. Hispano-Suiza 9Vbrs, nine cylinder radial. This motor actually is a French-built Wright Cyclone manufactured under license and renamed. It drives a controllable-pitch airscrew, presumably an American Hamilton.

The Loire firm is located at 4, Rue de Teheran, Paris. It also makes the

famous Loire 43.C1 fighter, which does 224 m.p.h.

This fighting seaplane—a single-seater, mind you—is built on a long, single float of dural construction. The wing is set low in the fuselage and the center portion is probably built directly into the fuselage structure. The outer panels have considerable dihedral and carry outrigger pontoons. From the side, the machine looks unusually bulky—but a head-on view gives a hint of its speed, which is said to be close to 200 m.p.h. with a full military load.

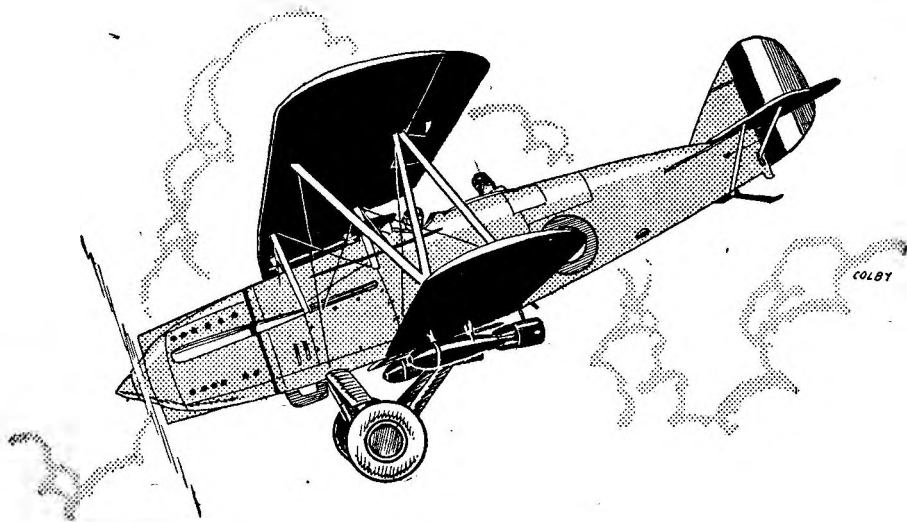
The Loire 21 is all metal. The fuselage is built up on steel tubes and covered with sheet dural. The pilot sits well down the body in line with the trailing edge of the wing. Details of the armament are unknown, except that a close inspection of the wing assembly hints at concealed guns mounted in the wings well outside the prop-arc. The design of the floats and Warren-truss supports indicates that it is a strong proposition and will take considerable pounding. Whether it can maintain its claimed efficiency in maneuvers is quite another thing.

THE HAWKER HECTOR

THE Hawker firm of Kingston-on-Thames, the old Sopwith outfit, has brought out another two-seat model which has aroused great interest abroad. It is interesting in that it has taken over the new Napier Dagger III, a twenty-four cylinder, air-cooled power plant that is rated at 700 h.p. It is actually a revamped Hart in general design, but it has a top speed of 185 with a rather complex military load.

The Dagger motor is a new British power plant built on the "H" design, with twelve upper cylinders opposing twelve below. It is, as stated above, air cooled. The new machine's showing will be watched with interest all over the world.

The Hector is listed as an army cooperation ship, which covers a lot of territory. It must fight high and low. It must be able to carry out reconnaissance "shows," do artillery spotting, photography, and contact patrols with a little low-down bombing as a side-line. To do all this, it is evident that the machine carries a complete load of military equipment—and two men who can handle it.



HAWKER HECTOR

As a modified Hart, the Hector has the same wing details and dimensions as the former day-bomber. The span is 37 ft. 3 inches and the overall length, 29 ft. 4 inches. The wing area is 348 sq. ft. Fully loaded the Hector weighs 4,770 lbs., or about thirty pounds heavier than the Hart.

This powerful craft carries considerable metal in its makeup. The pilot has two fixed Vickers guns, and the observer has two Lewis guns to

worry about. Light fragmentation bombs are carried in racks under the wings. The wings themselves are of unequal span and forward staggered. The center-section is carried above the fuselage on splayed-out N-struts. The outer sections of the top wings are swept back, while the lower wings go out at right angles to the longeron line. Frize type ailerons and Handley Page slots are regular equipment.

All Questions Answered

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



Richard Dobarganes, Jacksonville:—The mistake about the Macchi-Castoldi speed came through the pilot making two runs within a few days. On the first he did 423, and we answered a reader's letter the next day. Owing to the fact that this magazine, like many others, is made up about three months ahead of time, the question slipped by at that figure. Later, we corrected it. Also, many answers which are set in type do not get into the magazine right away owing to the great number on hand. So there are many chances of such mistakes which are not our fault. And records change fast! Mr. Mulligan has been offered by several airplane model firms already. Read the advertising columns of this magazine for their announcements. It is made by Alexander Industries, of Denver, Colorado.

John Duley, Cincinnati:—The prop you describe is no doubt one of the old D.H.4. or D.H.9 airscrews that were used late in the war days.

Harry Wlitz, Brooklyn:—Oxygen should be used above 18,000 feet, the amount depending on the physical needs of the individual. There is no such plane as the Joyce Javelin. I invented that for a story I wrote in our SKY BIRDS magazine.

Louis Ceppo, Brooklyn:—We do not send out pictures of planes. I do not think the Eaglerock is made to-day.

Paul Hart, Barrefield, Ont.:—What are wings for on an airplane? That's the prize question of the year. If you must have it, a wing is an airfoil designed to give lift to a body. It is the main supporting surface of an airplane. Of course, you might try to fly without any, if you want to.

Francis J. Osgoode, Regent's Park, London, England:—We are rather sorry we ever started this von Richthofen argument. Just as soon as we get it all settled with our American readers, you birds over there and in Australia start it all over again. Right now we don't care who shot him down. They can't blame it on me, anyway. Wing Commander Raymond Collishaw is now at the R.A.F. Station at Bircham Newton. He was on the Furious for a time. He is the same Collishaw who was so famous during the war.

Edward Boyles, Smyrna, Del.:—We cannot give out information regarding enlistments. You should see your nearest Recruiting Officer. We have tried to find room for the addresses of all the

big aircraft firms, but so far have not been able to include them. Why not go to your library and look them up in the Aircraft Year Book? We know no plans for a good gas model, and will not publish one until we do.

Walter Hipkins, Bayonne:—The Martin Aircraft Company is in Baltimore, Md. This address will reach them. Al Wilson was killed, I believe, some months ago, so he could not have doubled for Cagney in that picture. Some one did, of course, but I do not know who did. Why not write to the picture company and ask? You do not need a pass to go to that field. Use your Flying Aces Club card.

Sarah Jane Strayer, Johnstown:—Almost any private aviation school will accept girls as students. You try them and see. There is no government school where women are trained as pilots.

James Cox, Bayonne:—Compressed air motors may be purchased at Macy's or Gimbel's. They run up to various prices. You would stand a good chance to get an appointment as a flight cadet if you took four years of aeronautical engineering, providing then that you passed the physical exam.

Mark Wellington, Larchmont:—There is no particular reason for the names of the Sopwith machines, any more than there is a reason for the Curtiss Hawk but I like names better than cold letters and numbers. You can designate the types easier. I can't tell you the name of the man Elliot White Springs wrote about. It is supposed to be a secret. I read the book years ago and still have it before me.

John Cavanaugh, Syracuse:—McCudden was born in Gillingham, Kent, England, March 28th, 1895. He is buried at the British cemetery at Wavans, France. His last brother died recently and left only the mother alive. You might get in touch with C. G. Gray, 5 Rosebery Ave., E. C. 1, London, England. He was McCudden's closest friend.

John Horwath, King's Park, N. Y.:—You seem to be all balled up about those synchronized guns. Garros did not use a synchronized gun. He had a gun fitted that fired forward, and a metal band was placed around the prop where the bullets would glance off when the blades were in front of the muzzle. Fokker invented the first synchronized gun gear, and he claims to have flown it himself for several flights, but never used it, even though he once had a French ship

at his mercy. Then both Boelke and Immelmann were given machines fitted with these new guns, and Boelke is credited with shooting the first enemy ship down with one. I hope this explanation gets you out of that terrible tangle you were in.

Hugh Seton, Quebec:—The S.E.5 was powered with the 150 and 200 Hispano-Suiza made by the Woolsey company in England. A few had other Woolsey engines in, but were only experimental. Four or two-bladed props were used—whichever happened to be handy. The four-bladers were more even in torque, but hard to get. The Gauntlet does 228 m.p.h. The Leopard does 140.

Laurie Mulqueeny, New Zealand:—Captain Robert A. Little of No. 203 Squadron is the leading New Zealand ace with 47 victories. Major Roderick Dallas, with 39, and Captain John Gilmore, with 37, came next among the New Zealanders. Captain Hazel of No. 1 Squadron, with 31 victories, is the nearest Australian ace to any from New Zealand. Now crow! Mannoek was born in Brighton, England.

Ed Bogusz, Paterson, N. J.:—The V-1A is an eight-passenger transport with a top speed of 235. It has retractable undercarriage and is powered with the 735 "Cyclone." It is used by American Airlines.

Harold Wilson, Rochester:—The Lockheed Electra originally came out with a single rudder. Later on it was changed to the double type you mention. So you see, we were both right. As for the comparison you make with the other magazine, all I have to say is that FLYING ACES has about three times the circulation of the other. Someone must be wrong. We try to please all and it is a pretty tough job.

Jac Hanley, Chicago:—I know of no kits of the Martin Bomber in seaplane form. You could add the pontoons yourself, though, if you made the original model.

Mr. XXX, St. Louis:—Many thanks for the pictures. Hope you can get us some more like that, but don't go and get yourself pinched. We can't bail you out, you know. Thanks for the good turn, nevertheless.

Salvatore Colla, San Francisco:—The Bellanca Bomber is aluminum in color from stem to stern, as the saying goes. I do not know how fast the new North-

(Continued on page 72)

Flying Aces Club News

Well, well, look who's here—Old Man Winter to bite your ear! In fact, O.M.W. has even gone a step further and sent along a blizzard which has grounded the good old FLYING ACES Transport. But we'll just hoist our feet onto the hangar stove and look over the Club mail—

JUST as the "Three Musketeers of the Air," Arch Whitehouse, Doug Allen, and Herb Powell, are about to board the FLYING ACES transport for a trip around the country, word comes of an approaching blizzard, so the trip is called off and the ship wheeled back under cover. Ceiling zero! But let's join the boys around the stove in the hangar:

"Br-r-r! That icy wind certainly cuts through a fellow!"

"What's that, Arch?" asks Doug, looking up from a map.

"I say, it's blowing up good and cold," replied our pilot. "Fact is, snow is falling. I don't mind taking the ship up, but I'm a bit worried about bringing her down without sprawling us all over the landscape."

At this moment in rushes Herb Powell, rather excited. "After I warm my mitts a bit I've some news for you birds," he cries. And once thawed, he continues, "I was just up at GHQ checking reports from some of our members and they all advise against a trip at this time. Captain Lionel Berig, of the Dawn Patrol Station, DPHQ, says all ships are grounded in New England and thinks we'd better keep our feet on the ground. He advises that the storm is taking on blizzard proportions in his section, and other members of our radio unit report heavy snow blanketing the entire East."

"Well," replies Doug, looking a bit dejected, "guess the trip is off. But since it's rather comfy here by the stove and since we've packed an extra nice lunch, let's picnic here for a while and go over some of that mail aboard the transport."

With all agreeing, a big pot of coffee is put on the stove, and the three are soon hard at work looking over the interesting letters sent in by you Buzzards.

Arch is the first to break the silence. "Well, fellows," he says, "here's something interesting! That bird, Paul Guerrero, out there in Tacoma, can show the whole bloomin' bunch of us how to do things. See this folder? It's a program of a Ball held under the auspices of the Catholica Fraternitas Philippina in honor of Manuel Luis Quezon, first President of the Philippine Commonwealth. And now, gentlemen, please note that the entire back page is devoted to an advertisement of the FLYING ACES



The "Lady Southern Cross"

RELUCTANTLY, we must now give up hope for the safety of our well-known honorary member of the F.A.C.—Sir Charles Kingsford-Smith. In his honor we place the blue and gold standard of the Club at half staff.

Like others, we wanted to believe that Sir Charles would be found. We were optimistic, believing that he might have snatched the opportunity to use the ingenious device with which his Lockheed Altair was equipped—a device whereby he could jettison the engine. Then, with empty petrol tanks adding to her buoyancy, the craft could have floated indefinitely.

But despite a thorough search on the part of the R.A.F., nothing has been seen or heard of the "Lady Southern Cross" since it roared over Akyah, near the Burma-India frontier. While there is still hope that Sir Charles and his co-pilot, J. T. Pethybridge, may yet be found in the jungle, those chances are slim.

Yet, in a larger sense, Sir Charles Kingsford-Smith is not dead! Physically he is gone—but his achievements live on! The glorious *Lady Southern Cross* shall ever cast her shadow across Australian skies!

Club! I'd like to see it reproduced in the club news columns, but since it's printed in blue ink, which doesn't photograph well, guess we're out of luck. However, the club is highly indebted to Paul—he's one swell guy!"

"Speaking of things that can't be reproduced that should," said Herb, holding up a large newspaper photo to which is attached a

letter written on the blue stationery of the F.A.C.—"how's this!"

"Pardon my interruption, Herb," asserts Doug, "but I'll bet that's from Walt Baylis, Edmonton, Alberta. Isn't it?"

"It surely is," replies our Managing Editor. "And these fellows, known as the 'Air Rangers,' have a perfect right to throw out their chests, for their models were adjudged best in a contest sponsored by the Northern Hardware Company, in which more than 700 models were entered. That speaks well for Al Bruce, Herb Maughan, Roy Williams, Roy Faltinson, Walt Baylis, Bob Fleming, Jim McAlister, Bruce Gordon, Andy Gillis, Jim Halliday, Gordon Gainer, not to forget our Club."

At this point, the coffee boils over—a signal for "time out" for lunch. "Best coffee I ever drank," remarks Herb with much enthusiasm, "but don't print that, for I've told my wife the same thing. But, say, Doug, here's something that should be printed, and it doesn't come from one of our members either. For a change, it comes right out of my own bean. You know, I work day and night trying to give our readers what they like best. However, aside from letters from enthusiastic members telling me how much they like the model building plans, the Airmail Pals department, and their high regard for that fellow, 'Phineas' and the rest of our fiction, I'm in the dark. I'd like to know what departments and features they like best. Next time you write up the copy for the club news columns, I wish you'd ask our readers to tear out the contents page, check the five regular items they like best under "Departments and Features," and send the page along to us next time they write. Will you do that, Doug?"

"I will, on my word of honor," replies our National Adjutant, walking over to a window, whereupon he exclaims, "Great guns and rocket ships, look a that snow! Looks as though we might have to camp here for the night. But anyway it's cozy."

Suddenly Arch looks up from a letter, and addressing Herb, says, "Your desire to find out (Continued on page 95)



ABOVE we present eight of the twenty members comprising the Legion Aeronautica Mexicana, one of our most active F.A.C. outfits. Recently, in commemoration of Mexican Independence Day, the Legion staged a six-plane demonstration in the air over Los Angeles. The fellows above participated in the flight. They are, from left to right: Manuel Gastelum, Rodolfo Barraza, Frank "Stormy" Ylizarri (leader of the organization), Pete Leaman (owner of the Culver City Airport), Eleazar B. Pina, Manuel Duenas, Oscar Castro and Augustin Estrada. A fine bunch of flyers—and each a member of the F.A.C.!

JOIN THE FLYING ACES CLUB

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

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

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

Honorary Members

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

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

AWARDS AND HONORS

The D.S.M.

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

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

The Ace's Star

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

Official Charters

F.A.C. Flights and Squadrons are recognized only when they have been awarded Official Charters. These Charters are illustrated to depict the various steps of advancement in aviation, and the wording is in keeping with the high ideals and purposes of the Club. They are printed on a very fine grade of paper and the names of the Squadrons are hand-lettered. Charter applications must always be accompanied by a complete list of members with their addresses. For the Flight Charter send 25c, for the Squadron Charter 60c, to cover costs.

Volunteers for G-2

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

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

Attention, F.A.C.'s!



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

COUPON
No. 40



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

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

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



COUPON
No. 37

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

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 wrapping and mailing. Only one pair of Wings to a member. If you lose yours, send 25c for new ones.

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

March Membership Coupon

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

My name is

Age

Street

City State

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

Citations and Awards

of the Flying Aces Club

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

Richard McLemore	Kenneth A. Smith
Denny Hobbs	Milton Weglein
Roland DiMasi	Bill Scott
Audrea Heohle	Anthony Buczko
Bob Frankenfield	Henry O'Connell

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

Edith M. Davis	Leonard Carrion
Lester Schwadron	Joel Bell
Francis Holmes	Frank E. Dyer

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

Albert Distefano	Geraldine Pyl
William Gregg	Leonard Tarver

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

Robert Archer	Harry F. Euker
Edward A. Diller	

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

Charles Ames	Jack Kendall
Herman Spenger	Dickie Grossberg
Jack W. Staff	Phillip Brown

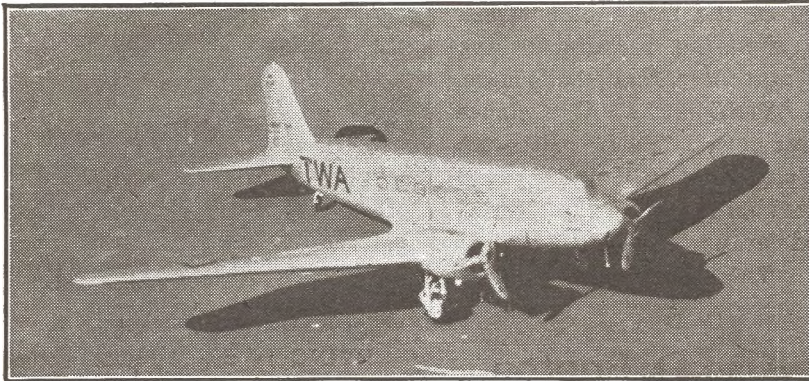
The following members of G-2, of the Flying Aces Club, have been awarded pocket knives for exceptional services to the Club:

W. L. Stewart	Jos. Pospisil, Jr.
John DePinto	Charles Kandigian
Leo Hershkowitz	Melvin Kaplan

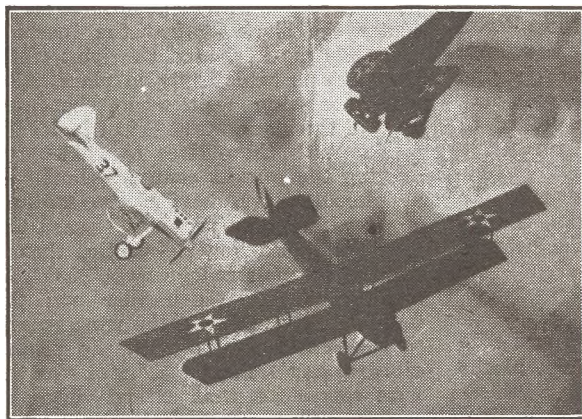
The following members of G-2 have been cited by the Flying Aces Club for exceptional services to the club and are being considered for the Distinguished Service Medal:

Marvin Grossman	Arthur Jebson
Louis Spognuolo	Joseph J. Baker
Stewart Booth	Edward Hanson
Frank Ylizariturri	William Robertson
Walter Thomas	Arthur Lord

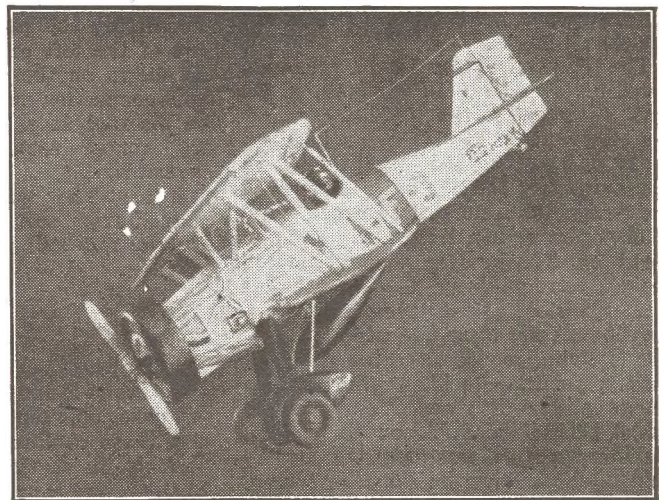
With the Model Builders



Left: You modelers are certainly making better snapshots these days! Maybe those photography articles of ours were a lot of help. Look at this swell Douglas D.C.2, built by James McKay, of Providence, R. I. We haven't seen such neat retractable undercarriage work in months. The ship's one of the cleanest jobs that's hit the FLYING ACES tarmac in some time. Drop in again, Jimmy.



Wham! How's this for a dog fight? It was laid out by C. D. Montgomery, of West St. John, Canada. A Boeing P-26 is whacking into a Ben Howard racer, and an old Jenny is shown scooting out of the picture. No place for a Jenny, eh, boys? All three are neat models, we'd say.



Below: British model fans surely go strong for the Curtiss Goshawk! Cast your eyes over this baby built by Richard Green, of Battersea, London. It has a 2-ft. wing span and extra struts on the undercarriage to take up the landing shock. And look at that bomb under there!



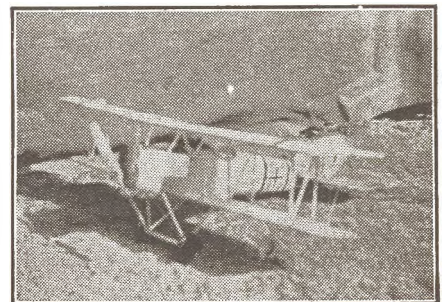
Peters Bowers, of Los Altos, goes outdoors for his pictures. You know that gag about California climate. And he certainly got a good "shot" of his Spad downing a Pfalz. And there's Jerry beating it across No-Man's-Land over on the right edge of the picture. Look at him go!

Right: We like to see our readers, too. This is Anthony Buczko, of Camden, N. J., displaying a biplane and a glider of his own design. The biplane has done 32 seconds indoors. And how do you like the paint job on the glider? Anthony is Captain of "A" Flight, F.A.C., of Camden. They're known as the Young Eagles.

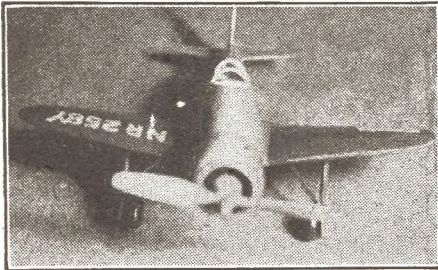


Left: This hot scrap between a Nieuport 28 and a Fokker Triplane was also provided by Pete Bowers. This time, the German gets the break—for you can see that the Nieuport pilot is tumbling out of his craft. This Bowers lad has a real imagination!

Right: The Empire is well represented this month. J. S. Bell, of Sydney, Australia, comes from Down Under with this Pfalz D-12. And it's got plenty of detail, proving the excellence of his workmanship. The decorations and paint work likewise show unusual care.



Fly the Howard Hughes Racer



A front view from above which shows how the barrel-like cowling shapes into the fuselage.

DO you remember *Hell's Angels*, the first real aerial movie? Well, Howard Hughes, the pappy of that thriller, also fathered the new ultra-fast racing airplane which we draw upon for this month's feature model.

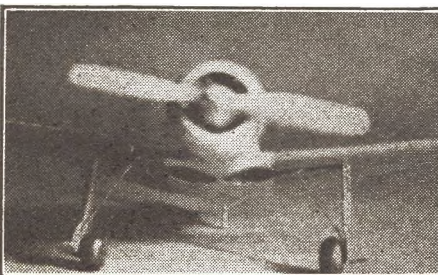
The Hughes Racer is the cleanest speedster ever built, in our opinion. Its cost approached the \$100,000 mark. Powered with a Twin Wasp souped up to 1000 h.p., the ship's top speed is approximately 355 m.p.h. In the eyes of the Army, it's a potential pursuit ship.

The span is 25', length 27', and the tread 10'. The landing gear, of unique design, retracts fully, as does the tail skid, likewise. (Next thing you know, they'll be retracting the wings!)

Our flying model has been designed simply, yet like its big brother it also boasts plenty of speed. Your finished model should weigh about six ounces, including a .4 oz. weight in the cowl to hold the nose down on the race course.

WING PANELS

CEMENT the blocks for the fuselage together and while they are drying, start the all-balsa wing panels. The drawing in Plan 4 is arranged to show the bottom of the left wing panel and the top of the right wing panel. In this manner, the parts and lettering for both panels utilize one pattern. The workable aileron is on the left wing, so the parts demanded by the workable aileron may be omitted from the right wing construction, the "flaps" on both wing panels are cut out after the panels are covered and hinged back on with tissue. Cut the main ribs out of rectangular pieces of 1/16" sheet balsa barely large enough, and use the remaining pieces to cradle the covering to the shape of the ribs while building the wings. Work on a soft board and use plenty of pins to hold the work. After



Here's full instructions for building a model of the latest blue streak of the sky—the record-smashing Hughes speedster. And what's more, it's a FLYING model! One glance at the four swell "shots" of the job on this page, and we'll wager you'll start work on it right away. Finish it, wind 'er up, and—Z-z-z-z-z-i-p!

There she goes!

✱ ✱ ✱

By Alan D. Booton and Ralph Pickard

completing the panels, cut the aileron out of the left one, attach the aileron as shown on the drawing, and let the wire connection extend out 2", so it may be inserted in a 1/16" hole drilled in the center section when ready to assemble.

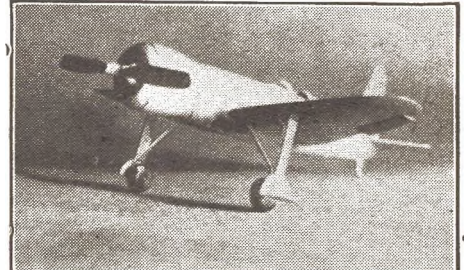
Note: The wing panels may be shaped from soft balsa blocks, if preferred, and still maintain the balance of the model.

FUSELAGE

TRACE the outlines of top and side views on the joined fuselage blocks (See Plans 2 and 3 which fit together) with the joint centering the top outline. Cut these outlines on a band saw, if possible. In carving, the sections at A, B, C, C', and D are round, and at E and F the templates are used. Note that the head rest at E fairs out near the center line, has no usual indentation, and gradually disappears at F. Sand the fuselage to your satisfaction, dope it all over, and then resand with very fine sandpaper. Separate the halves and hollow them out, 3/16" thick starting at C', and gradually taper to 1/16" thick at the extreme rear. Tapering the thickness adds balance to the model. Cut out the formers, E and F, from 1/16" sheet balsa and sand them to fit in position when the fuselage sides are placed together. Cement a 1/8" sq. piece to the back of former F and attach the anchor with plenty of cement. Next make the 1/4" balsa disc to fit in the cowl, and make the nose plug to fit snugly in the disc. The nose plug must be removable in order that you may insert and wind the motor. Now cement all parts and put the fuselage back together. When dry, cut away the fuselage, where the center section goes, to the shape shown on the side view, to receive the center section. Rig the control shaft wire and leave it until the center section is ready.

Left: This view shows the housings into which the undercarriage retracts when the ship is in flight. (But to be on the safe side, you'd better leave your wheels down when you put 'er into the air!)

Right: We've included this photo to illustrate how the wing roots are faired into the fuselage. A nice bit of fillet work!



The speed lines of the ship are displayed to great advantage in this side quarter "shot."

CENTER SECTION

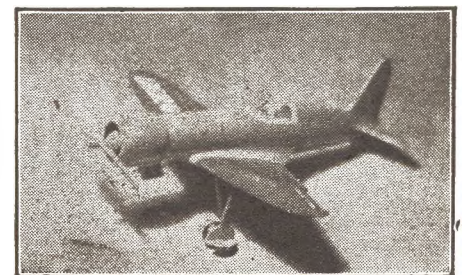
CARVING is easy by this method. Shape the block (See Plans 1 and 3) to fit in the aperture cut in the fuselage for it and when a good fit is made, center the block against the fuselage and then mark around the joint while the block is held firmly in place. Also mark the wing positions on the outer ends of the block with 1 1/2° of incidence angle. With these lines to guide you, carving the correct contours should be simple. Be careful with the trailing edges where they fade out toward the fuselage, and hollow the portion that is covered by the fuselage to 1/4" thick to make room for the rubber and the torque control. Cement the wing panels to the center section with the proper dihedral angle. Bend a 1/4" crank on the wire connection that extends into the center section and cement a bushing or washer at the hole to make a bearing. The crank must be bent several degrees forward of vertical while the aileron is at neutral.

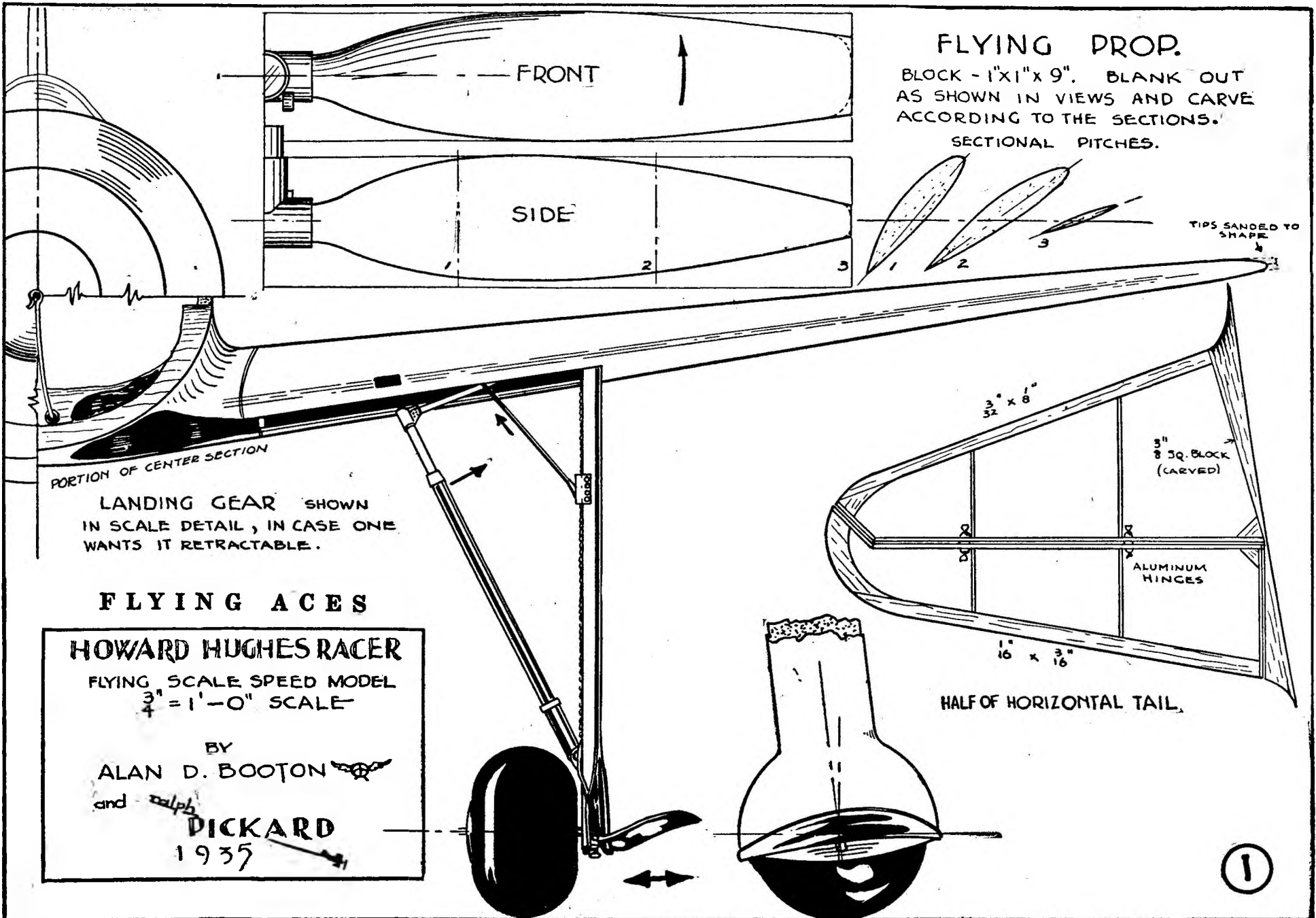
LANDING GEAR

THE landing gear has been drawn to scale in order that you might employ your own pet method of assembly. Put a 1/32" music wire through the strut, including the axle and anchor, which is securely cemented into the retract well, and omit the other struts for flying purposes. The tail skid can be made retractable, but a stationary one is more suitable. The one shown is made of aluminum tube, wire, hard balsa, and bond paper for the flaps.

TAIL SURFACES

THE tail surfaces are of the built-up type to keep the tail light. The ribs are 1/32" sheet balsa and the outlines are of denoted sizes. Streamline the ribs
(Continued on page 96)

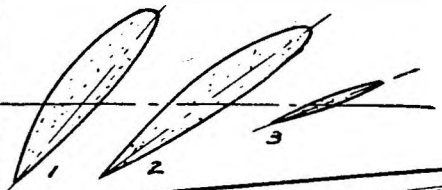




FLYING DROP.

BLOCK - 1"x1"x 9". BLANK OUT AS SHOWN IN VIEWS AND CARVE ACCORDING TO THE SECTIONS.

SECTIONAL PITCHES.





TIPS SANDED TO SHAPE

LANDING GEAR SHOWN IN SCALE DETAIL, IN CASE ONE WANTS IT RETRACTABLE.

FLYING ACES

HOWARD HUGHES RACER

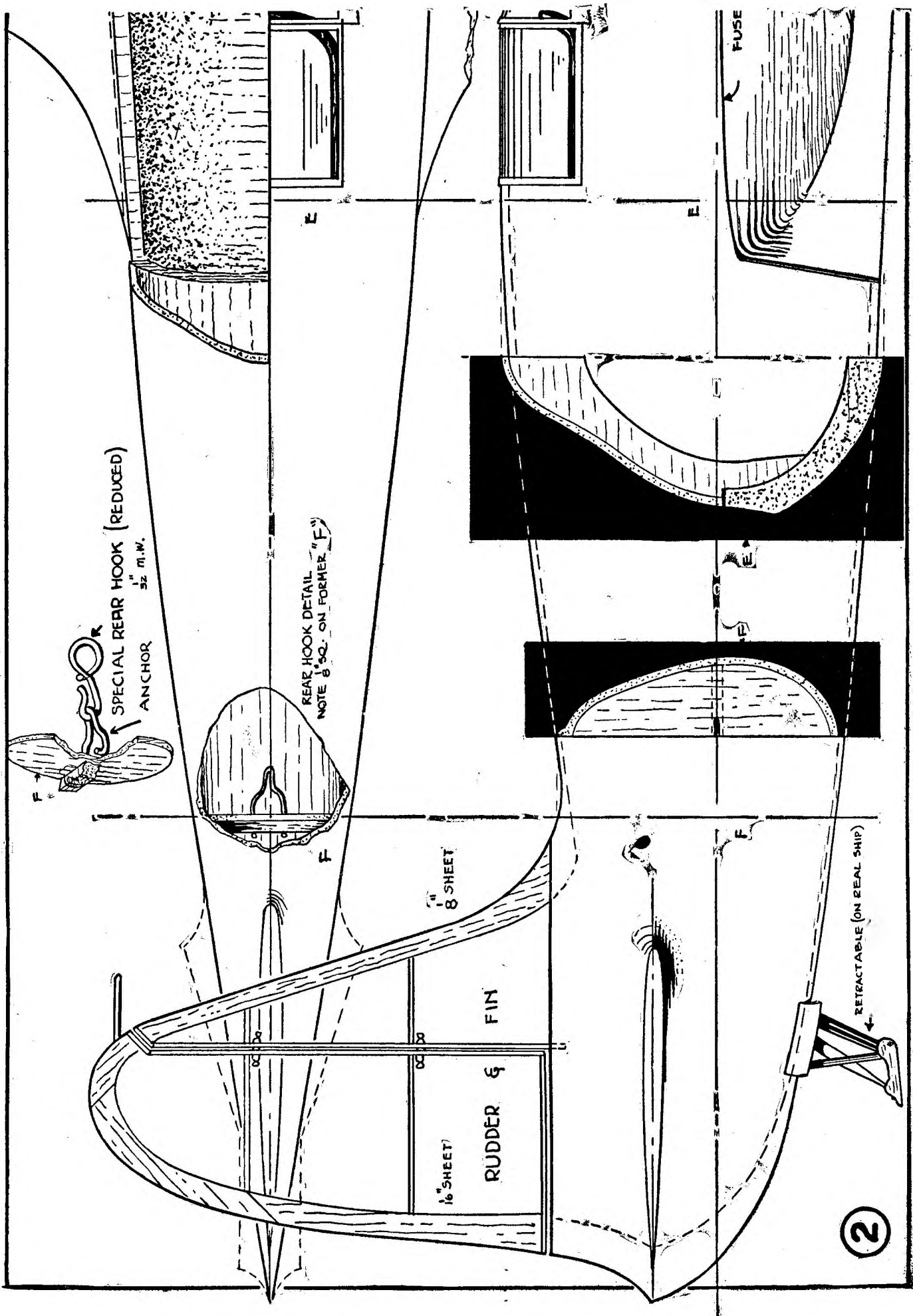
FLYING SCALE SPEED MODEL
3/4" = 1'-0" SCALE

BY
ALAN D. BOOTON 
and *Ralph*
DICKARD
1935 

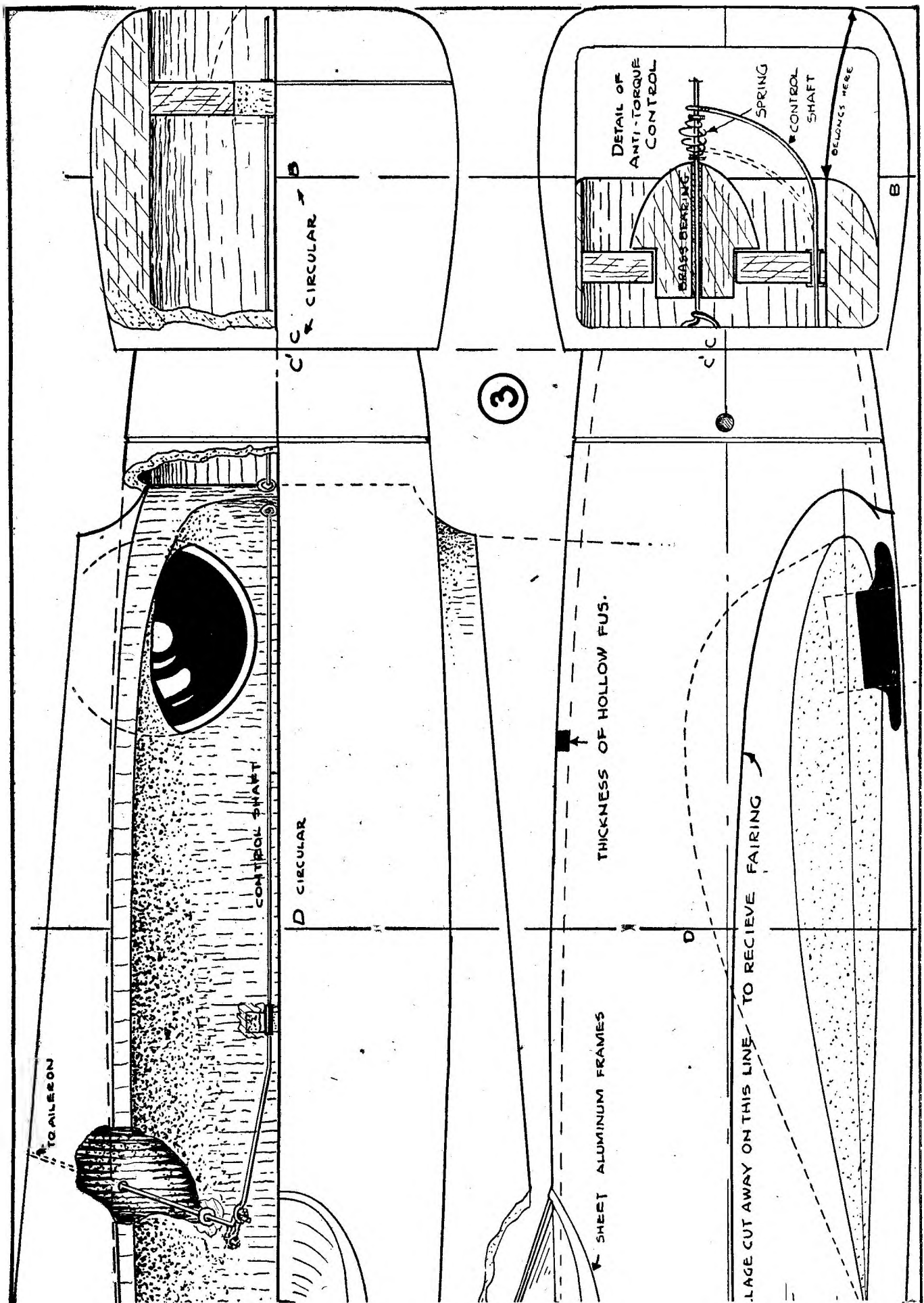
HALF OF HORIZONTAL TAIL.

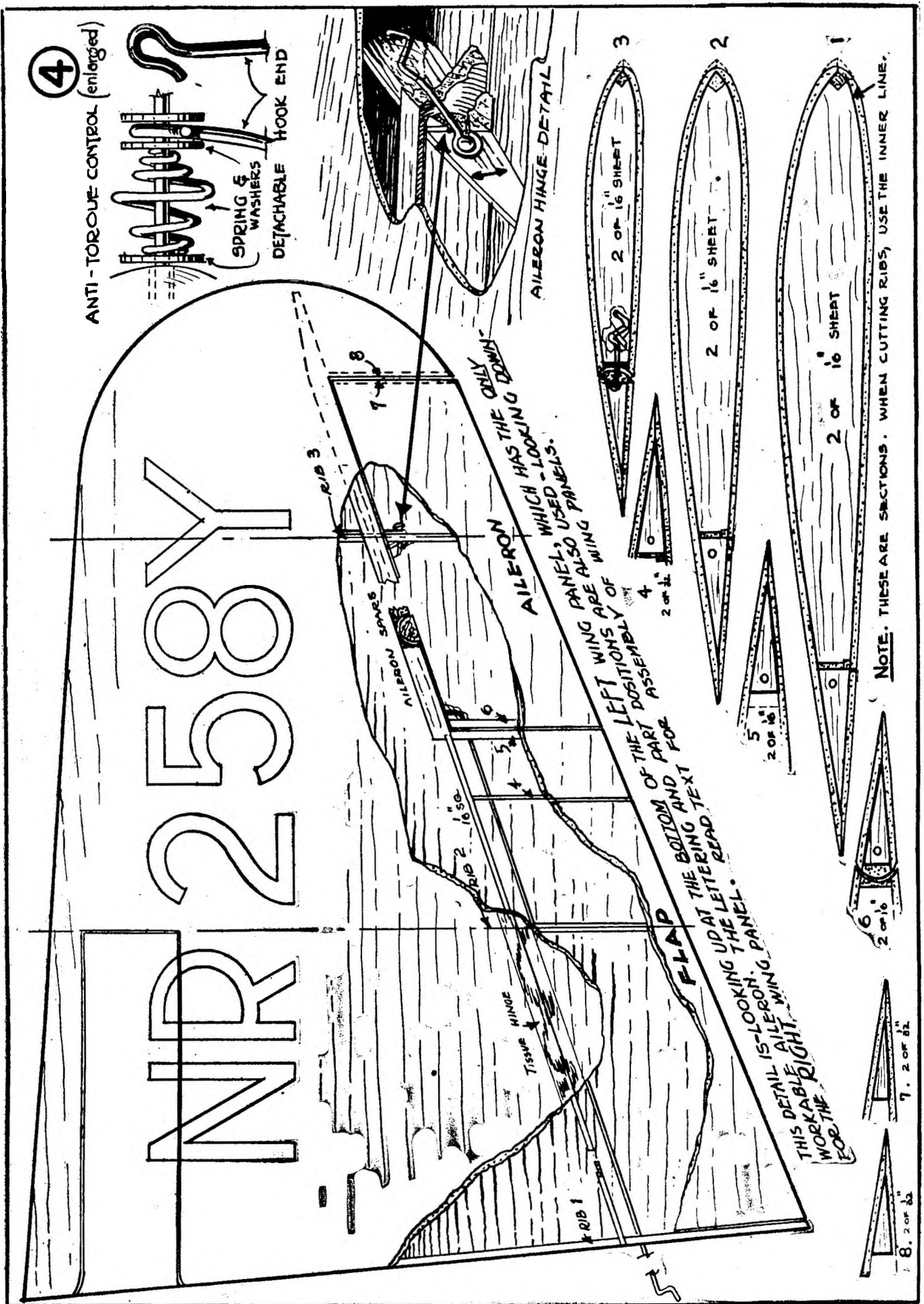
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FLY THE HOWARD HUGHES RACER—Plan 2



FLY THE HOWARD HUGHES RACER—Plan 3





Flying Aces Model Laboratory

WIND TUNNELS

Recently, we announced that FLYING ACES had arranged to conduct model craft experiments in the newly-built wind tunnel of the Casey Jones School of Aeronautics. So now we launch a new department wherein we will explain, from month to month, the results of tests conducted in order to help you build better models.

IN this initial article of our new department we are going to tell you something about wind tunnels in general and about the Casey Jones School wind tunnel in particular:

By Avrum Zier
Model Department Editor

The purpose of the wind tunnel, as most model builders are aware, is to test the airplane and its various parts without actually having to fly the ship. The principle upon which every type of wind tunnel operates is known as "Relative Motion." The meaning of this term may be better understood by imagining yourself traveling in an automobile at, say, 60 miles per hour. At such a speed we are aware of the tremendous pressure exerted on our hand when it is extended out into the open. If we now stop the automobile, and by employing some mechanical means (such as a propeller) cause the *air* to be set in motion, we find that we experience the same pressure effect on our hands as though we were actually moving.

In a wind tunnel we have a condition similar to the latter case. Here, the airplane, or part to be tested, is mounted on a structure which is located in a moving stream of the air. By means of propellers, the air is pulled past the airplane, setting up the same flight conditions about the ship as experienced in real flight. These conditions are recorded by various instruments.

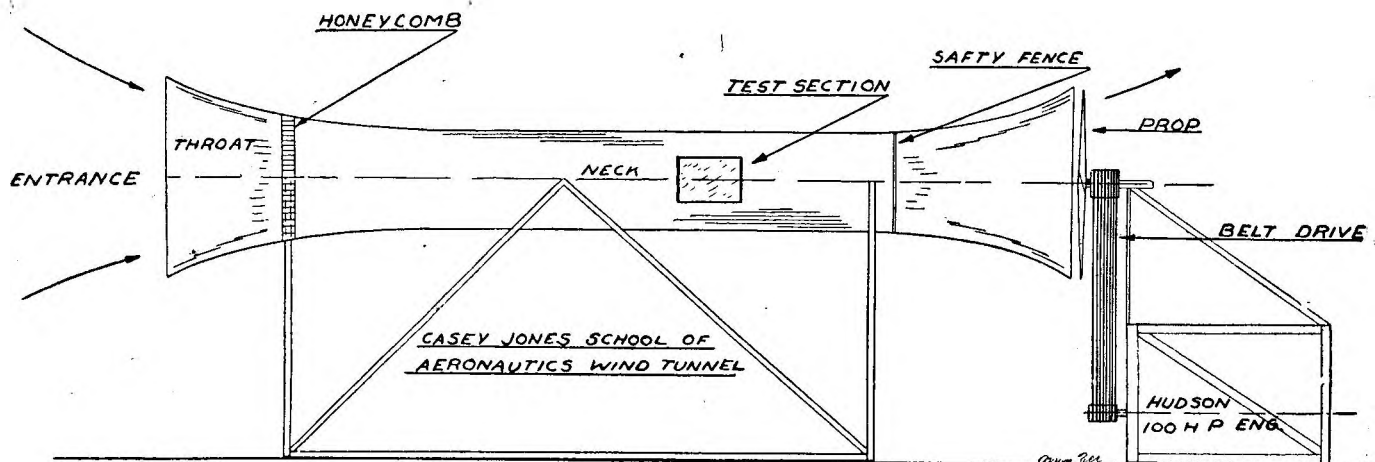
Wind tunnels are of various designs, depending upon the method by which the air is circulated through the tunnel. The simplest type of tunnel is called the *open-throat venturi type*. In this kind of tunnel, the air, by means of a propeller, is drawn through one end of the tunnel and exhausted through the other. Another type of tunnel is known as the *single return type*, and as the name implies the air after being drawn through the tunnel is brought back to the entrance of the tunnel by means of a return chamber. This tunnel is more efficient than the open throat type because once the air has been set in motion little power is required to maintain this motion, also because a more even flow of air past the test section can be maintained. Our third type of tunnel is known as the *double return type*. In this tunnel the air after being drawn through

the tunnel is returned to the entrance again by means of two return chambers.

The biggest tunnel now in operation in the United States is of the double return type. It is the huge tunnel at Langley Field, Virginia, which is capable of testing full size airplanes up to wingspans of 45 feet. The return chambers on either side of the mammoth tunnel are 50 feet wide and have a height varying from 46 to 72 feet. The entire tunnel is constructed as a large building with the outer walls of the return chambers serving as the walls of the building. Located in the exit cone are two propellers of 35 feet 5 inches diameter. They are driven by two 4,000 h.p. slip ring induction motors controlled to give 24 different speeds varying from 25 to 118 miles per hour.

The general arrangement of the Casey Jones School wind tunnel, in which our model airplane tests are to be conducted, is shown in the diagram at the bottom of this page. The tunnel is of open throat venturi type having a complete overall length of 20 feet and a maximum diameter of 4 feet at the entrance and exit and a minimum diameter of 2 feet at the test section. At the exit end of the tunnel is located a 4 foot metal propeller which is driven by a 100 horsepower Hudson engine. The propeller is mounted 5 feet above the motor and is operated by a series of six belts. The exact speed with which the propeller is capable of drawing the air past the test model has not been definitely established at this writing. It is, however, believed to be near 100 miles per hour. The flow of air through the tunnel is regulated by the throttle of the engine.

AIR is always *drawn* through a tunnel rather than driven through. This is in order to obtain as smooth a flow of air past the test model as possible. Why the air does not flow smoothly through the tunnel when being driven, instead of drawn, by the propeller is due to the rotational momentum imparted to the air by the rotation of the propeller. By pulling the air through the tunnel this effect is greatly overcome. To



further straighten out the air flow, a honeycomb section is placed directly in front of the test section. This consists of a series of tubes which straighten out the air stream before it reaches the test section.

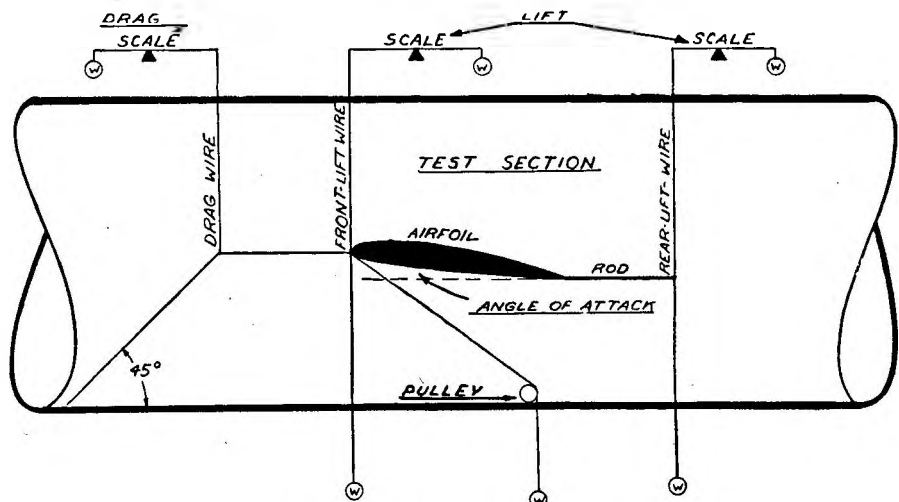
In experimenting with model airplanes we are concerned with "Low Speed Aerodynamics." It has been known to engineers of high speed airplanes that the formulas used to design airplanes of speeds within the range of 100 to 200 miles per hour, when applied to higher speed jobs do not hold true. This fact may be contributed to the characteristic change of air when it approaches the velocity of sound. At such velocity, the waves set up by sound have an effect upon the nature of the air. This effect is not taken into account in our present formulas, with the result that new formulas must be applied to account for such change.

Likewise it may be said that at low speeds within the range of model planes the characteristic nature of the air may be of a different nature. This is one question which we hope we will be able to answer through these experiments.

The general set-up for the testing of an airfoil is shown in our second diagram. Here we see how balancing weights and scales are actuated by wires leading to the airfoil after the air is put in motion.

The first step in conducting our studies will be to test airfoil sections to determine their use in model plane construction. In testing an airfoil we obtain by instruments (see diagram) two facts concerning the section—the amount of lift and the amount of drag the airfoil develops. From these two facts we are able, by a series of calculations, to determine the four major characteristics of an airfoil which are essential in the designing of an airplane. These are as follows: (1 and 2) Lift and drag coefficients, (3) lift-drag ratio, and (4) center of pressure. (For those who are interested, let us explain that the lift and drag coefficients are abstract numbers by which we multiply our known quantities to obtain the actual amount of lift and drag developed by any wing employing the type of section in question. The lift-drag ratio is obtained by dividing the lift coefficient by the drag coefficient. The center of pressure is found by taking what are known as *moments* about the leading edge of the wing.) Suffice it to say at present that it is these characteristics which we are going to determine for each airfoil section tested.

Airfoils are tested at different angles of attack. For each angle of attack we obtain different amounts of



TYPICAL SET UP FOR TEST

lift and drag hence we have different characteristics. To check the results, the airfoils are also tested in a downward position, known as *camber down*. After the section has been tested at the various angles of attack and the characteristics have been determined, the calculations are plotted graphically on a chart against the angle of attack at which the section has been tested.

Referring back to our airfoil test diagram, let us suppose that air is in motion past the test section at a constant velocity. We are aware that by virtue of Bernoulli's theorem a lift will be developed over the airfoil section which will tend to lift the wing. Due to this tendency the wires which are in tension become slack, causing the weights on the top to become unbalanced. The sum of the weight which must be added to the balances of the front and rear lift wires to restore the tension in the wires, or re-balance the device again, is the amount of lift developed by the airfoil at that particular angle of attack.

The amount of drag developed by the airfoil section is found in the same manner as the lift. As the air strikes the section, a certain amount of drag is developed which tends to pull the horizontal leading edge wire back, thus reducing the angle of 45° formed by the drag wire and the floor of the tunnel. The reduction of this angle causes the drag weight to become unbalanced. The amount of weight which must be added to restore the balance to equilibrium is the amount of drag developed by the airfoil for that given angle of attack.

And now, are there any questions? If so, let us have them. Address FLYING ACES MODEL LABORATORY, care FLYING ACES MAGAZINE, 67 West 44th Street, New York City.

From the Model Builder's Workbench

EIGHT HANDY HINTS

THERE are a lot of little things you can do to improve your models once they're built. Here are a few tips:

1—Always glue flat washers to each axle hole on celluloid wheels, otherwise the axle wire will tear the celluloid and enlarge the hole at the first hard bump, causing your wheels to be wobbly.

2—For brace wires, use "buttonhole twist" silk thread, obtainable in any

department store. It's quite strong, and a good steel gray color is very realistic.

3—To protect your rubber from being cut by piano wire shafts or rear hooks, cover these units, where they contact your "power plant," with rubber tubing cut from rubber covered electric wire—or wind 1/8" strips of electricians' tape around the hooks.

4—A quick way to tighten up paper on wings, fuselage, etc., is to hold the same for a second or two over a steam-

ing kettle spout—then dry for ten minutes and apply banana oil or thinned dope.

5—Discarded Schrader tire valves yield good accessories. The tiny springs can be used for shock absorbers, while the cores or shafts make good imitation Lewis machine gun barrels. Also, for Colt air-cooled rear machine guns, the valve springs make good cooling ring imitations. A thick, ordinary shirt

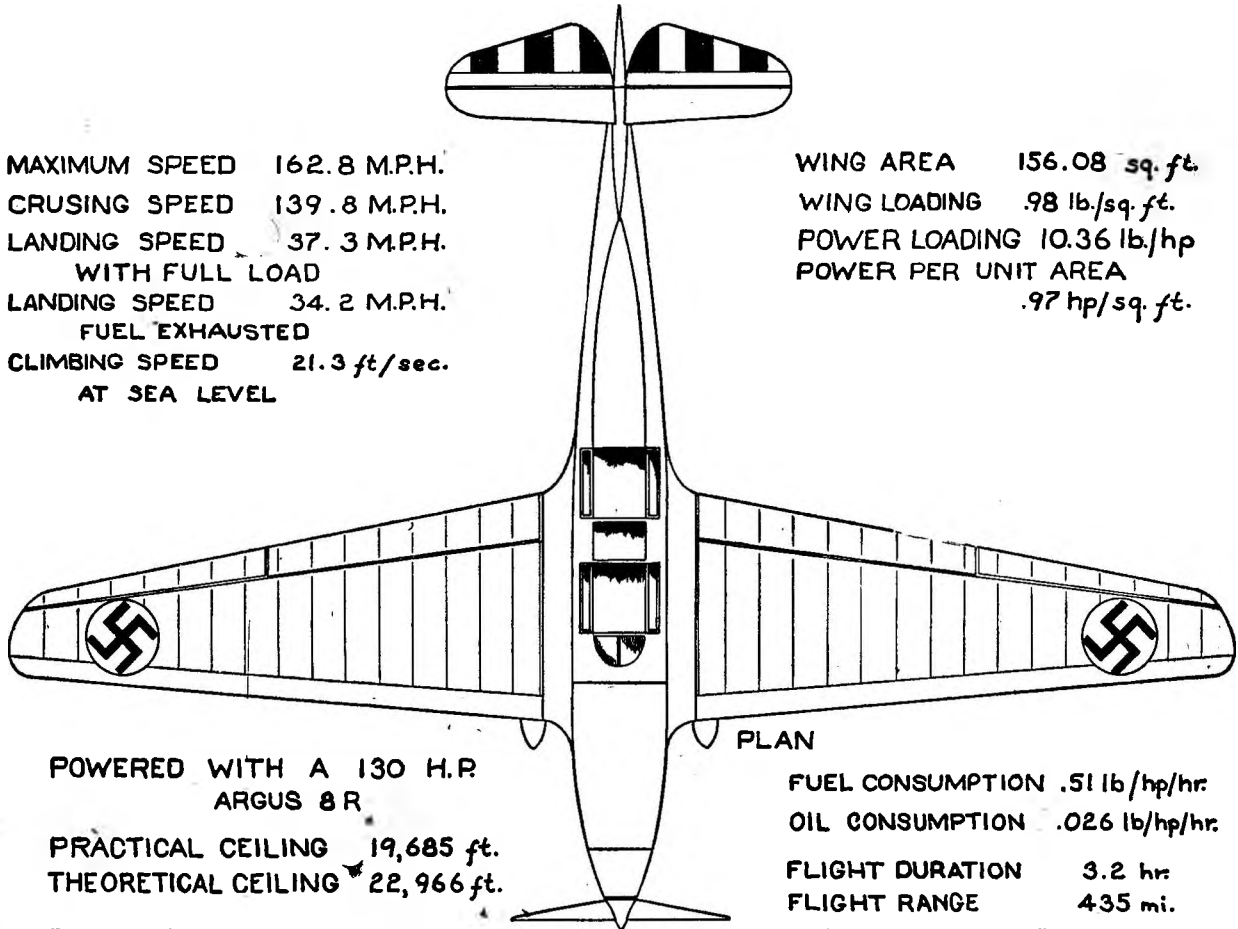
(Continued on page 56)

Construct the Messerschmitt M29

If you're handy with the balsa, you can make a mighty neat solid model from these plans of the popular German low-wing speedster. And here, too, are the important specifications of this well-streamlined ship.

MAXIMUM SPEED 162.8 M.P.H.
 CRUISING SPEED 139.8 M.P.H.
 LANDING SPEED 37.3 M.P.H.
 WITH FULL LOAD
 LANDING SPEED 34.2 M.P.H.
 FUEL EXHAUSTED
 CLIMBING SPEED 21.3 ft./sec.
 AT SEA LEVEL

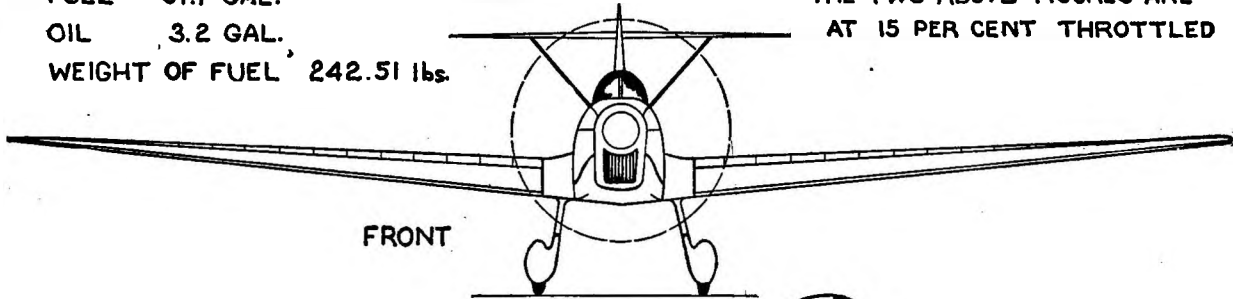
WING AREA 156.08 sq. ft.
 WING LOADING .98 lb./sq. ft.
 POWER LOADING 10.36 lb./hp
 POWER PER UNIT AREA
 .97 hp/sq. ft.



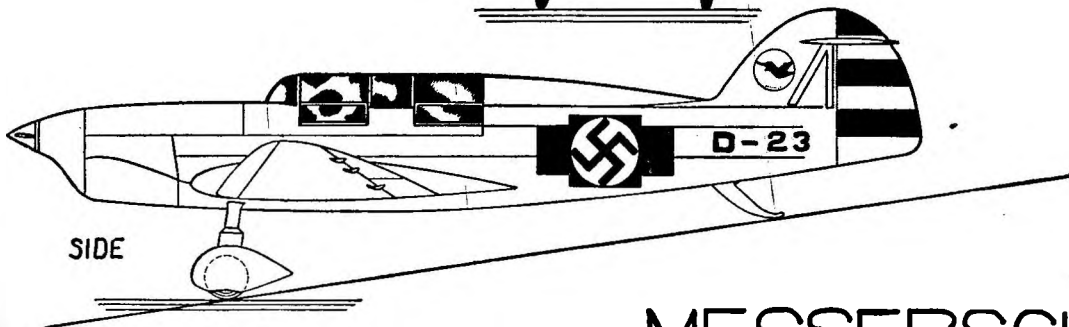
PLAN

POWERED WITH A 130 H.P.
 ARGUS 8 R
 PRACTICAL CEILING 19,685 ft.
 THEORETICAL CEILING 22,966 ft.
 FUEL 31.7 GAL.
 OIL 3.2 GAL.
 WEIGHT OF FUEL 242.51 lbs.

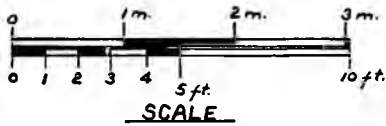
FUEL CONSUMPTION .51 lb./hp/hr.
 OIL CONSUMPTION .026 lb./hp/hr.
 FLIGHT DURATION 3.2 hr.
 FLIGHT RANGE 435 mi.
 THE TWO ABOVE FIGURES ARE
 AT 15 PER CENT THROTTLED



FRONT



SIDE



MESSERSCHMITT
 'M29'

NICK LIMBER

Make the "China Clipper"

Here's just what you've been looking for—full instructions for making an excellent solid model of Pan American's great trans-Pacific Martin. And to make this article of added interest, Bill Winter gives you a lot of concise information on the *China Clipper's* specifications, performance, and flying equipment as a preface to the construction plans.

• • •

By William Winter

LESS than a century ago the famous American Clippers carried the fame of a growing nation to the distant Orient. Today, the Clippers-of-the-air travel in one hour's time a distance as great as was covered in a whole day by those sail-crowded ships of yesterday!

If we had space to write as many words as there were pieces of mail in the *China Clipper's* huge load on her first trans-Pacific jaunt, we would still fail to do justice to Pan American's remarkable achievement or to the Martin people for their production of such a capable plane.

Even the Jules Vernes of 1930 would not have anticipated that five years afterward an airline would be flying the Pacific on a schedule route, carrying mail and passengers with the reliability of a train.

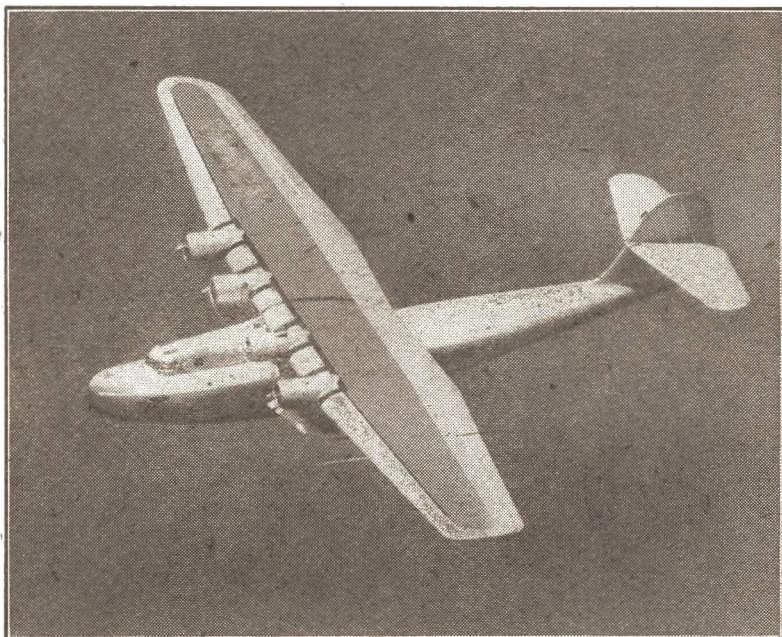
The *China Clipper*, as well as its sister ships, is also capable of flying the Atlantic with twenty passengers and a ton of mail. Carrying fourteen passengers, these planes can cruise three thousand miles with ease.

To appreciate the magnitude of the trans-Pacific enterprise, it is necessary to review the salient features of the Clipper's design and the equipment developed for the use of these planes.

The immense wing is tapered both in section and in plan. Its span is one hundred and thirty feet. The four radial, double row, aircooled motors are mounted forward of the wing and are faired into it. The over-all length of 90 feet 10 $\frac{33}{64}$ inches better conveys the gigantic proportions. The hull itself is 84 $\frac{1}{2}$ feet long. In height the Clipper towers 24 feet 7 $\frac{3}{4}$ inches.

The following unusual facts illustrate the greatness of the *China Clipper*. In flight, the hungry engines consume four tons of fuel every twelve hours. At cruising speed, seven hundred and fifty pounds of fuel are used each hour.

The nose of the hull is used for the anchor compartment. Above, and directly behind, is the bridge. Here the pilots are seated. Behind them provision is made for all the radio equipment developed by Pan American for these ships and deemed necessary for their precise operation. Beneath the bridge low in the hull are two mail pits of large capacity. Adjoining them is the baggage space. Amidships are the passenger compartments, lounge and berths. The rearmost space available for passenger use is utilized as a lavatory. High in the hull forward of the wing is the engineer's compartment. Here are located a myriad of switches, dials, and instruments.



The ship that has brought a new era in aviation—Pan American's huge Martin, the *China Clipper*, conqueror of the vast Pacific! As you construct your model of this striking flying boat, check your work from time to time with this photograph.

The *Clipper* on a scheduled run follows an invisible trail blazed for it by the radio beam. The radio beam enables the ship to fly on its course over endless stretches of water regardless of visibility and to arrive at tiny, distant islands with the trueness of an arrow in flight. The craft is also equipped with a radio homing device and compass. The operator reports the position of the *Clipper* every thirty minutes when it is in flight. He constantly aligns the schedule with stations far ahead by means of radio communications. Ship-to-shore tests revealed that the radio-obtained bearings were accurate within three degrees at distances less than sixteen hundred miles. At a two hundred and fifty mile range the accuracy was within one degree. At the lonely island bases, in addition to the all important radio equipment, are located powerful beacons.

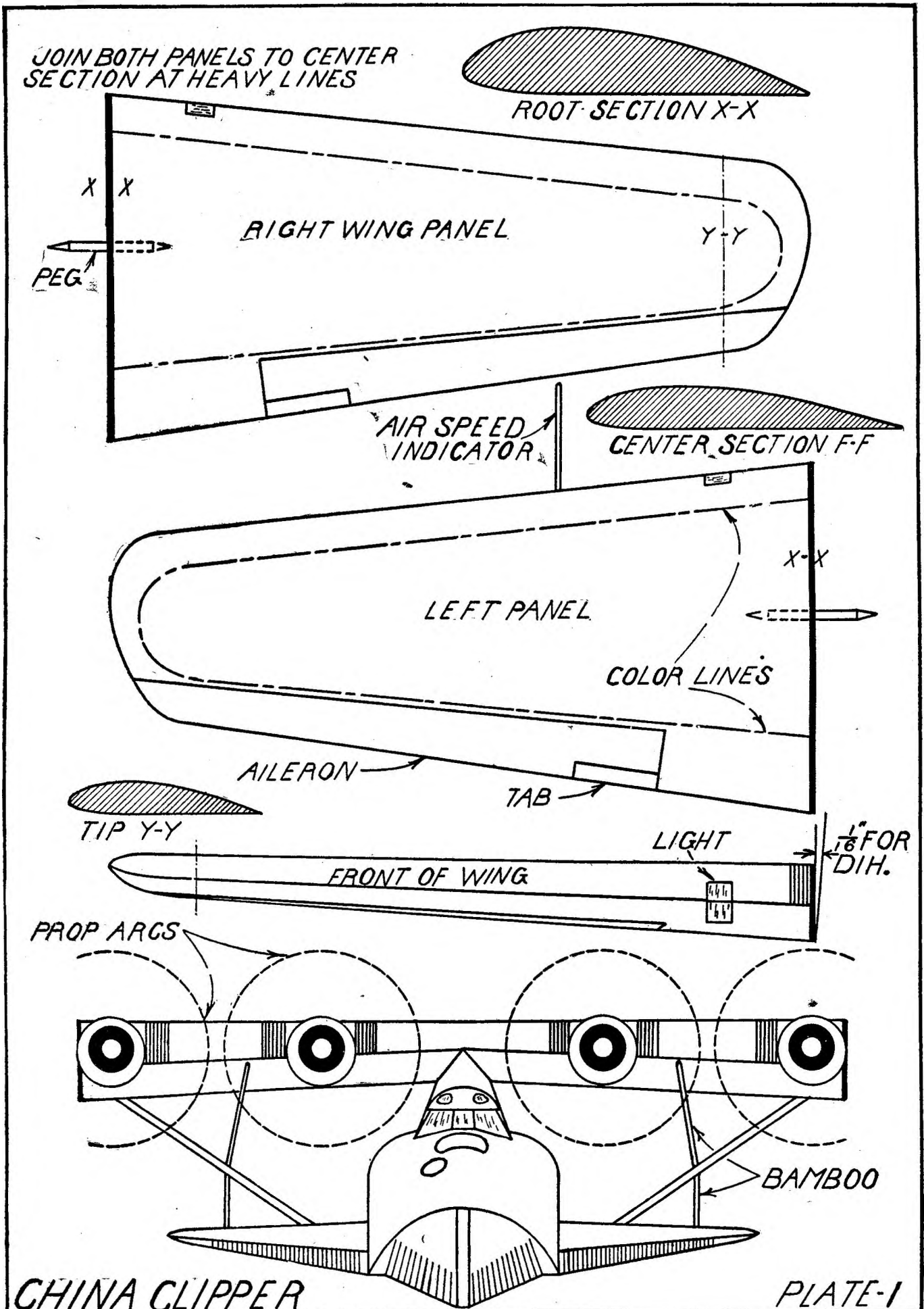
Due to the large fuel consumption and the long distances flown it was important that extremely accurate fuel-flow meters be installed. Five of them are used on the *Clipper*. One is placed on each of the four gas lines leading to the four motors. The fifth is installed between the main and reserve tanks. Each meter weighs twelve pounds totaling sixty pounds for fuel flow meters alone. Their recordings are visible on indicators that summarize the messages forwarded to them.

AS it is of the utmost importance that not only the usual temperatures be available but that the temperatures at all the critical points be evident, a device for that purpose is also necessary. Technically known as a Potentiometer, it indicates the temperature at twenty critical points. The famous Sperry automatic pilot and a directional gyro contribute to the crew's ability to carry out the flights without error.

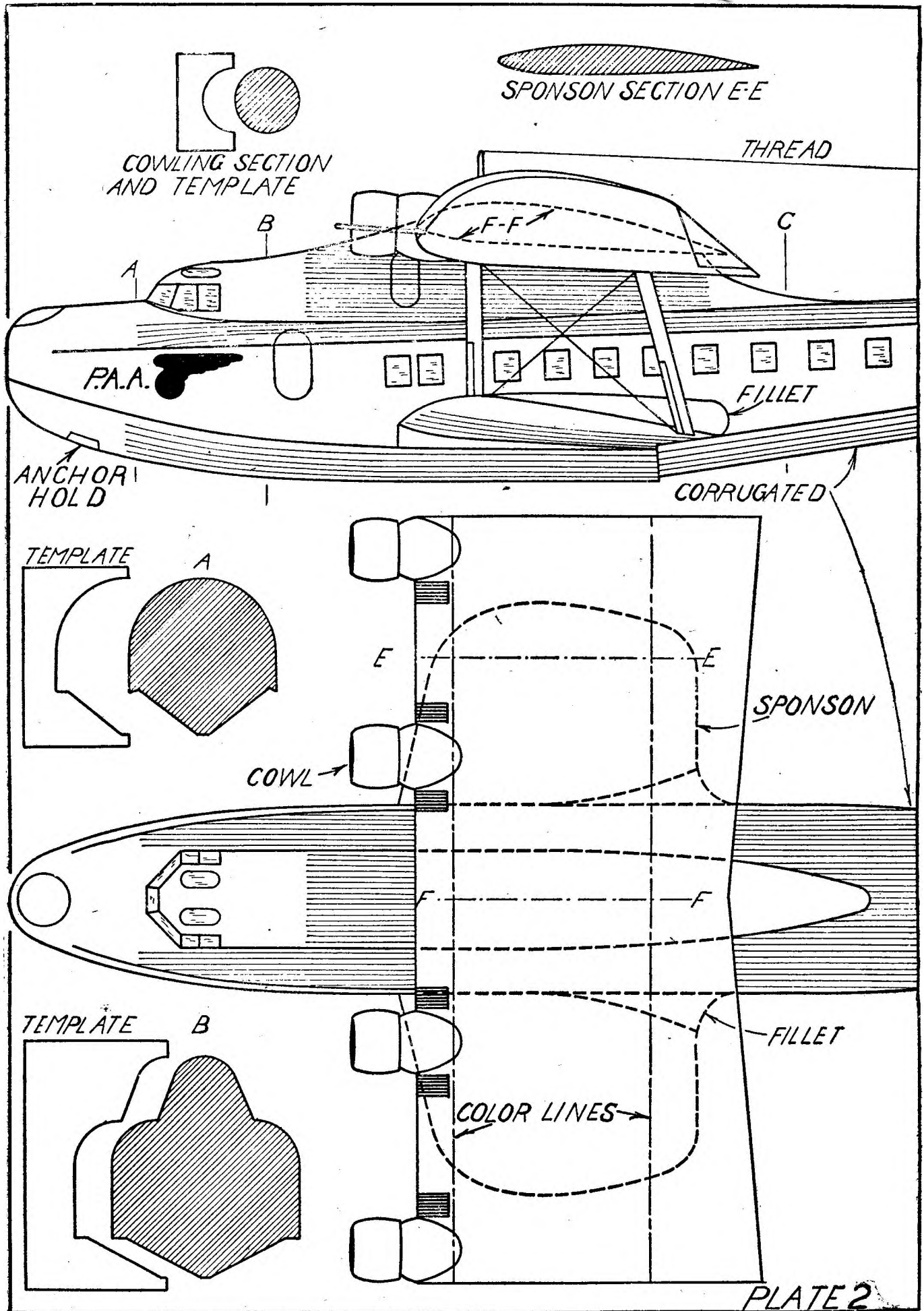
The Pioneer bubble octant, Kollsman drift indicator, (avigational instruments), and the Longines Chronometer (time device) are indicative of the quality and

(Continued on page 92)

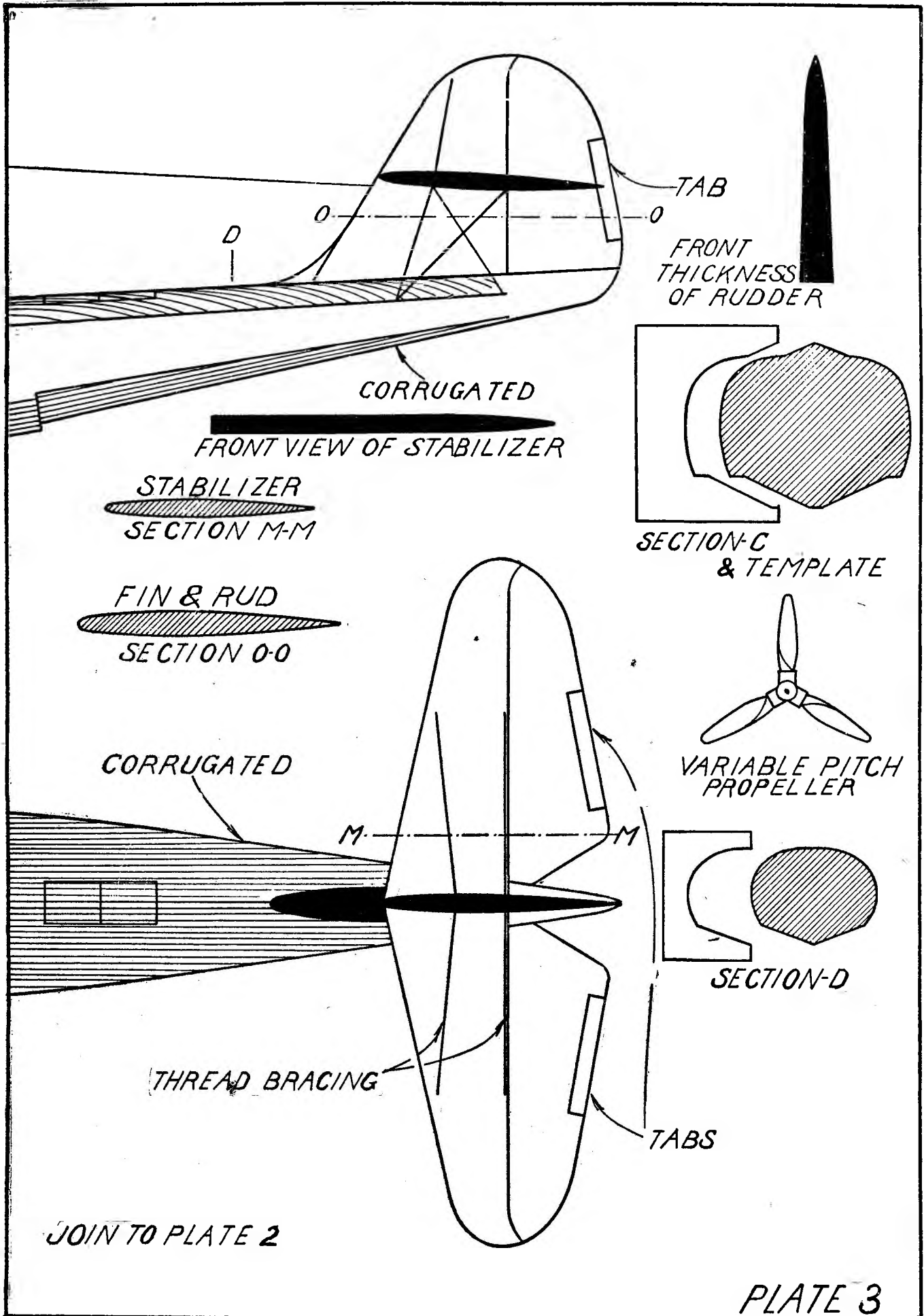
MAKE THE "CHINA CLIPPER"—Plan 1



MAKE THE "CHINA CLIPPER"—Plan 2



MAKE THE "CHINA CLIPPER"—Plan 3



Rumania's I.A.R. 14 Pursuit

Military craft—that's what you model fans say you like best. Well, we've landed a beaut for you here! This Rumanian Pursuit is one of the neatest jobs FLYING ACES has ever offered. And it's a flying model that'll show you plenty of top-notch sky scoting.

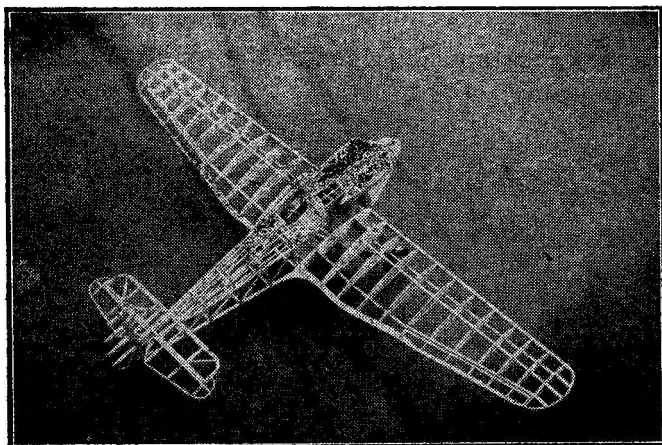
✱ ✱ ✱

By Elbert J. Weathers

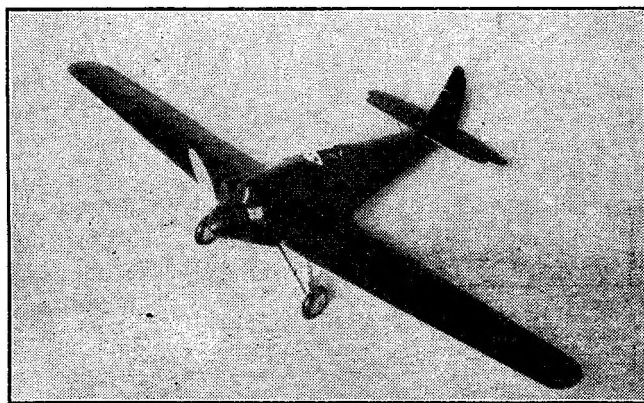
THIS model will prove unique wherever shown or flown—for it is a miniature of the pride pursuit ship of that small country, Rumania. A speedy low-wing fighter, its prototype is produced by the I. A. R. (Industria Aeronautica Romana) of Brasov. The power plant consists of a 650 h.p. Hispano-Suiza engine. The top speed of the plane is reported to be 225 m.p.h., although the exact figure has not been released. The ship has a wingspan of 40.8 ft., while that of our model is 24½ inches; for the scale to which it is reproduced is 1/20th full size. Accuracy of design and detail is guaranteed by the author as it was built from factory drawings. The plans for the model are drawn full size.

FUSELAGE

START the model with the fuselage by making two frames of 3/32" square balsa (medium hard). Notice the two slots built-in to take the wing stub spars. After these have been completed, build them together as shown in top view of fuselage. Next, select some hard 1/32" sheet balsa and make the fuselage formers, which are notched for 1/32" by 1/16" stringers. After they have been cemented in place, lay in the 1/32" by 1/16" balsa stringers, starting at the middle and working down each side. They should be of hard balsa, to avoid warping between formers. The next step is to cement the 1/32" medium sheet balsa to formers No. 3 and No. 4 as shown. Trace cockpit outline on balsa before cementing in place and then cut it out later. A strip of 3/32" diameter rubber tubing may now be cut half way through (this means through one wall), and placed around edge of cockpit to form

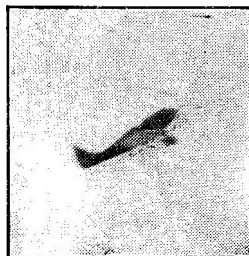


You'd almost swear this was a shot of the real I.A.R.14 prior to covering. But it's actually a photo of Bert Weathers' excellent model! Best of all, his accompanying article tells you how to equal this A-1 workmanship.



Here's the completed ship. It's trim and true—and you'll find it a winner, both as a flyer and as a display model.

the cockpit combing. Now we come to the nose block. Use medium balsa for this. It is first cut to the general dimensions, 2" long, 2" wide, and 2¾" high. Be sure it is cut so grain runs parallel to fuselage as shown. Now cut in half, as shown in front view of fuselage. Cement the halves together lightly, using just enough cement to hold until the exterior can be shaped.



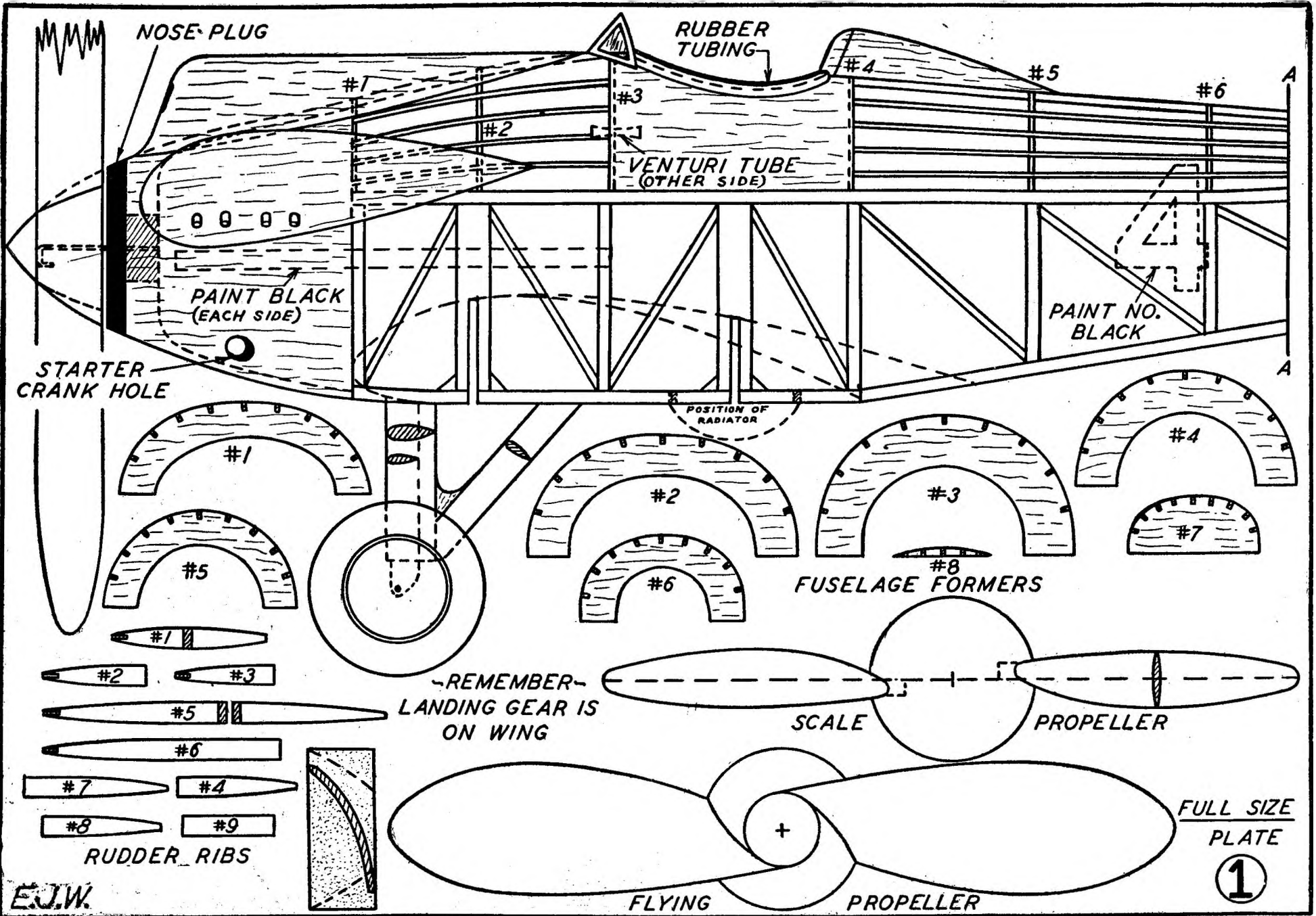
Atop!

After this is finished, break it apart and gouge out the inside to a thickness of about 1/16", except in front where it is left about ¼" thick, as shown in plan. Finally, drill a ½" hole in front end of nose block to take the nose plug. Give this front part a heavy coat of cement on the inside and outside, for you must remember you are working with a small piece of end grain wood here. Now cement the block to the rest of the fuselage.

The next step is making the dummy cylinder blocks. The size and shape of each is clearly shown on plans. They are carved out of soft balsa. After the three have been cemented in place, fill in all corners where they meet the fuselage with a mixture of cornstarch and clear dope. This is important to assure good appearance of the finished model. The headrest is next. Use soft balsa, cutting block to top and side views first, as you did the cylinder blocks. Round the front as shown and finally cement the headrest to the fuselage. Make the windshield frame from 1/32" hard sheet balsa, and cement cellophane in back of it. The smaller fuselage details may be made at this point. Cut twelve pieces of 1/16" aluminum tubing or reed to 3/32" lengths and cement in positions indicated for exhaust stacks. The radiator is now constructed. After carving it from soft balsa, lay thread in parallel rows to form ribbing, holding the thread in place with a coat of cement.

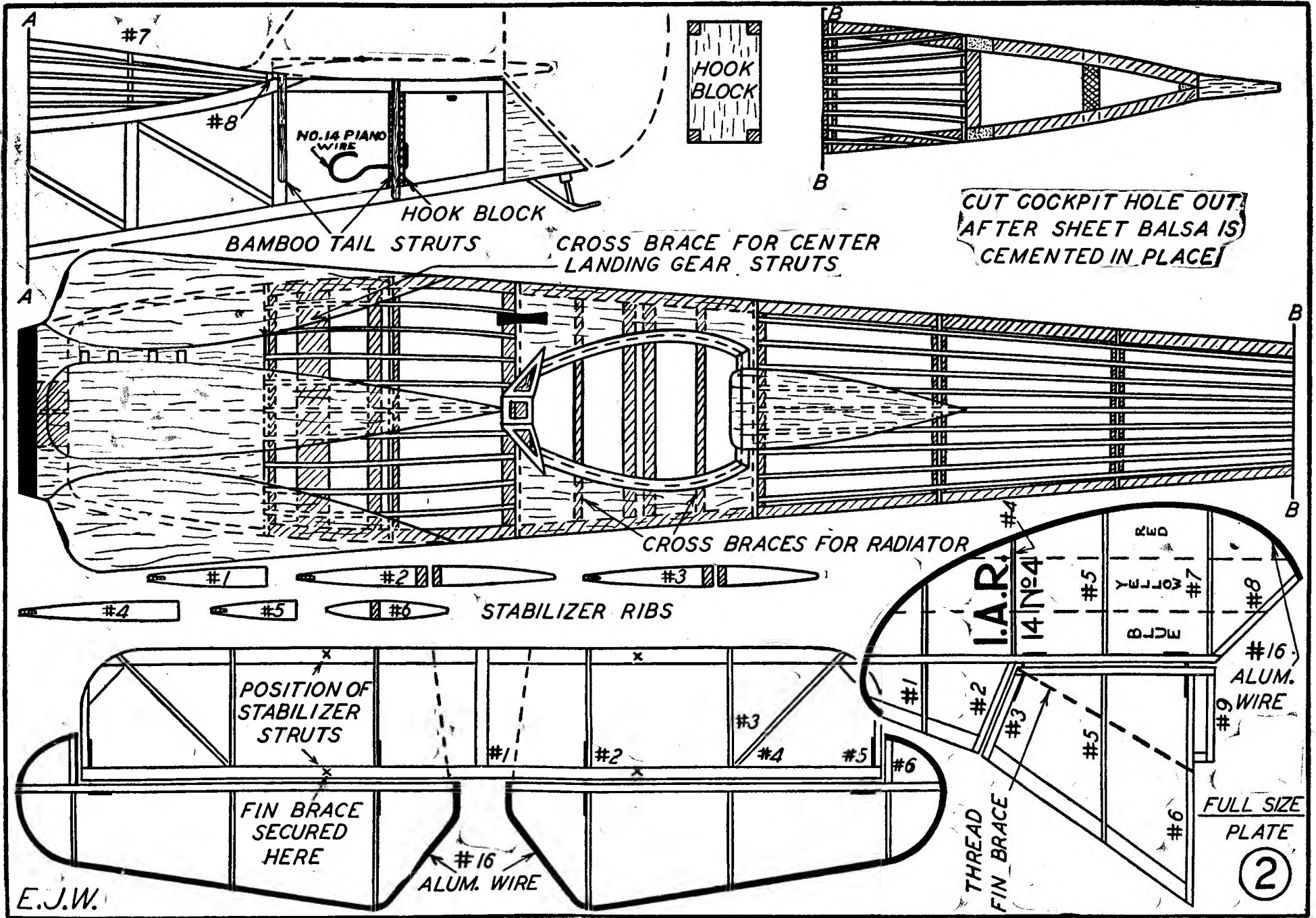
Next comes the Venturi tube, which is cemented on right side of cockpit in position shown. The last detail (for the time being) on the fuselage is the two holes through the nose block on the underside. These are where the starter crank is inserted on the large engine. The tail piece upon which the skid is built is of medium balsa, carved to shape and cemented to fuselage. The tail skid is constructed of bamboo. The shoe should be carved from a piece of bamboo also. The unit is then built together on the tail block as shown. The small block in the rear of fuselage which

(Continued on page 93)



[49]

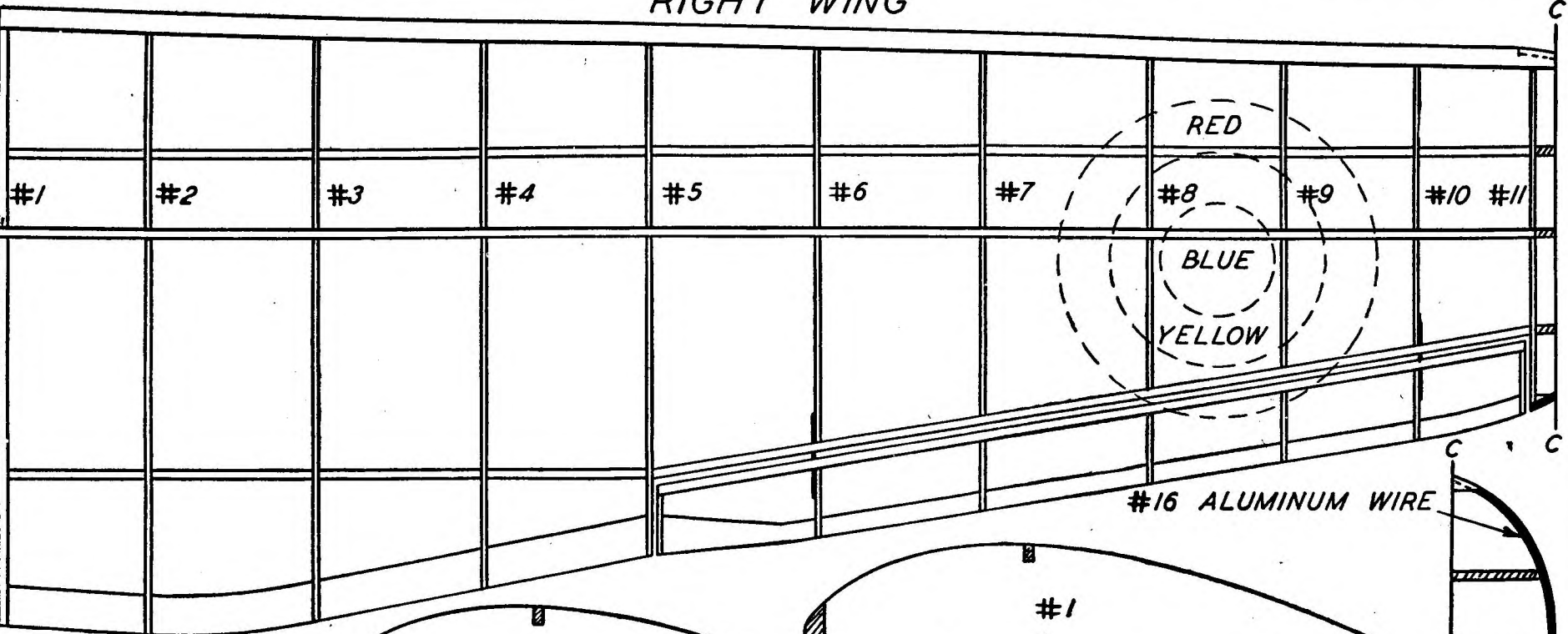
E.J.W.



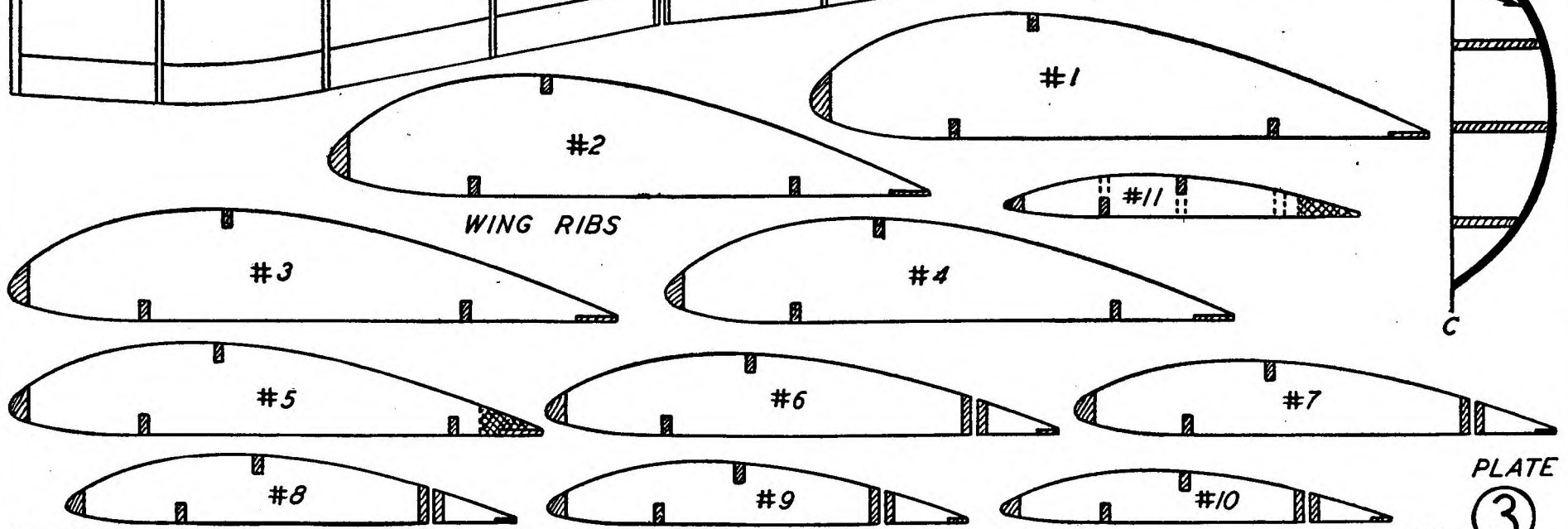
[50]

E.J.W.

RIGHT WING



WING RIBS



PLATE

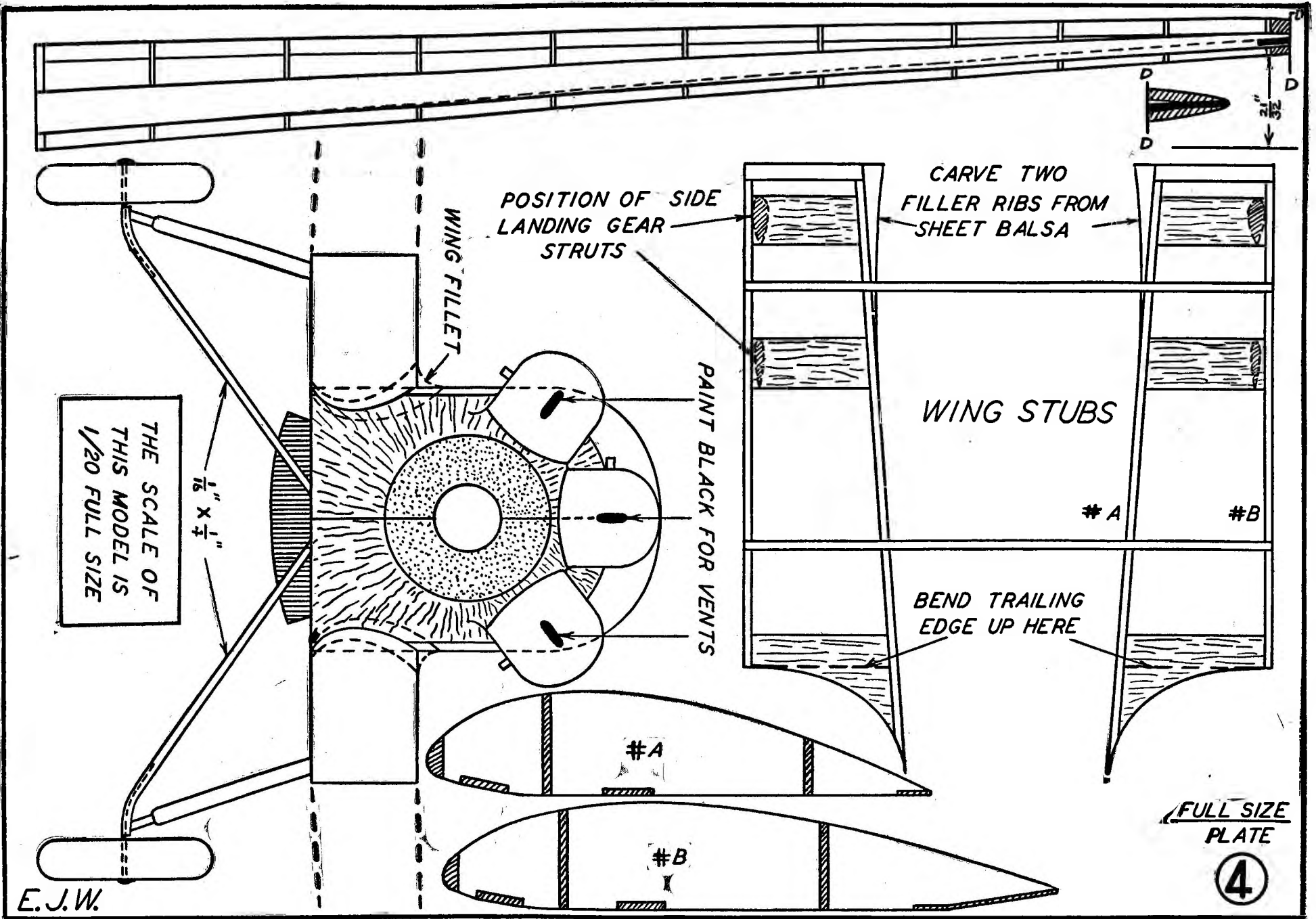
3

FULL SIZE

E.J.W.

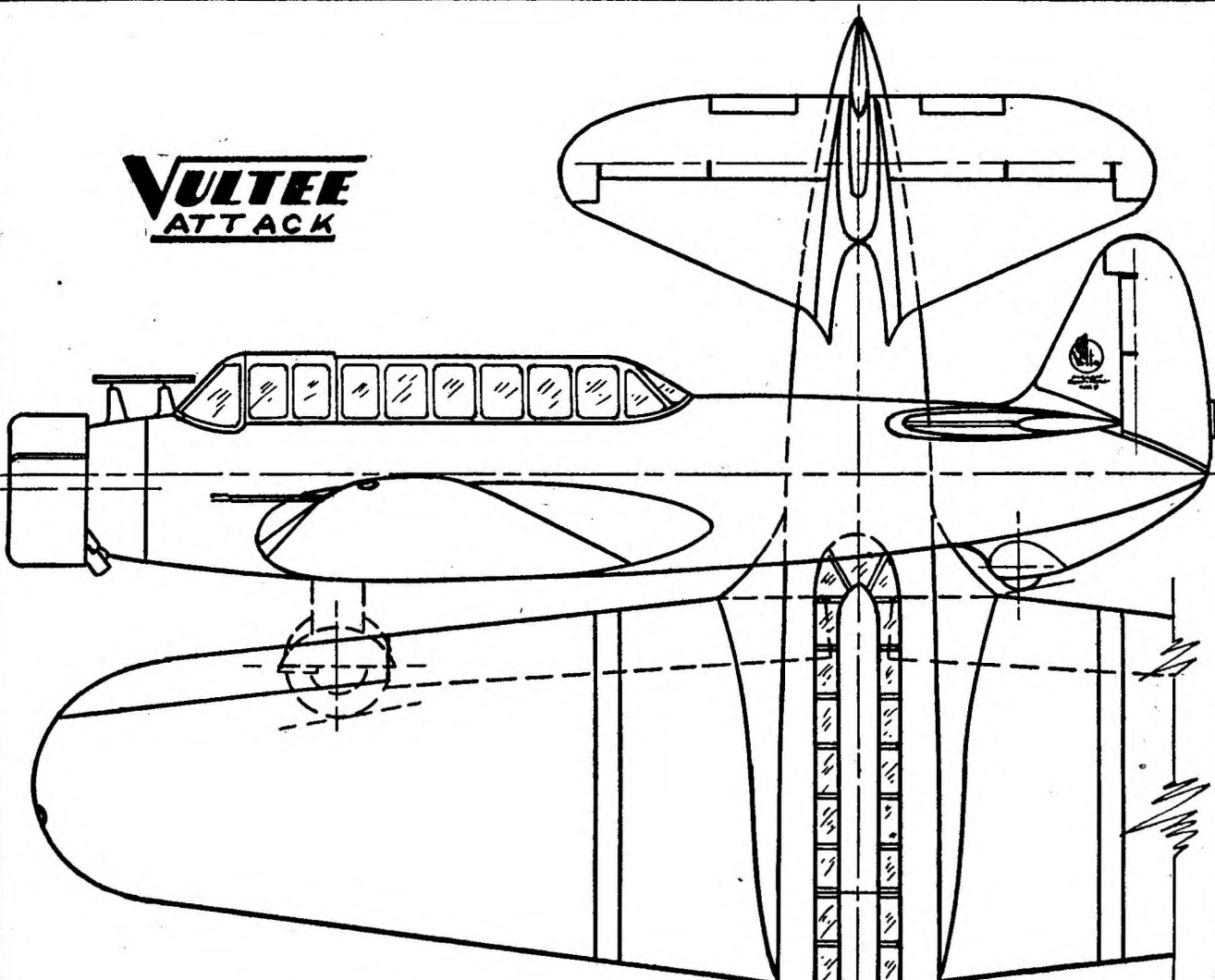
[51]

RUMANIA'S I.A.R. 14 PURSUIT—Plan 3



Build a Solid Model of the Vultee Attack Ship

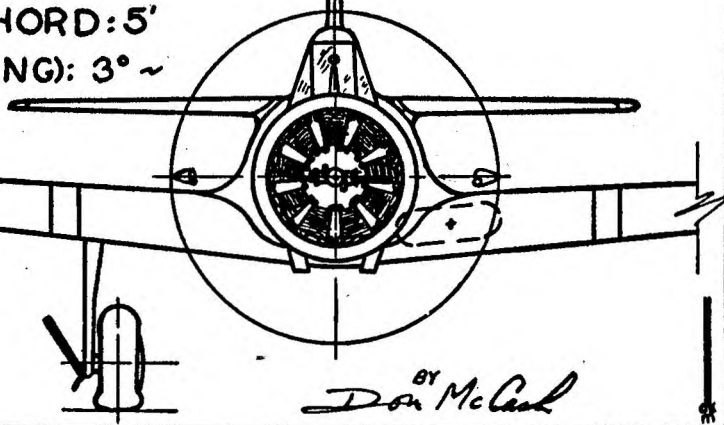
VULTEE
ATTACK



SPECIFICATIONS

- ~ WRIGHT CYCLONE SR-1820-F2, 735HP ~
- ~ 5 MACHINE GUNS ~ POISON GAS ~
- ~ 1000 LBS. OF BOMBS ~
- ~ TOP SPEED, 250 MPH ~
- ~ OPERATING SPEED, 235 MPH ~
- ~ APPROXIMATE DIMENSIONS: ~
- SPAN: 50' ; LGTH.: 37' ; HTH.: 11'
- ROOT CHORD: 11' ; TIP CHORD: 5'
- ~ DIHEDRAL (TOP OF WING): 3° ~

SCALE
0 1 2 3 4 5 6 7 8 9 10
3/16" = 1'



BY
Don McCook

Flying Aces Indoor Tractor

* * *

Fans, this little job is simplicity itself! And if you get tonight's homework done early, you'll have ample time to get this craft completed and in the air before the bugler blows "Taps." Best of all, the wing of the Indoor Tractor packs plenty of efficiency—which means that when she zips off her neat flights the accent is on duration. And now, here's how you go about it—

* * *

By Jesse Davidson

THIS little endurance-type tractor is just as simple to make as it looks. Not only does it fly well but it also is one of those indoor "stayer-uppers" that fly in lazy circles just below the ceiling of your room. And it's all the better if your ceiling is high. The drawings (see next page) are shown half size except for the wing rib shapes which are full size. The dimensions are likewise given in full size.

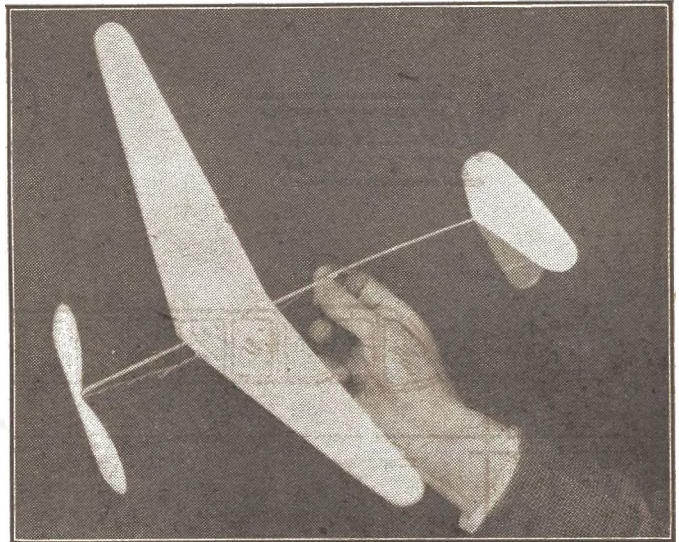
THE WING

BOTH front and rear wing spars are strips of soft balsa measuring $1/32"$ by $1/16"$. The front spar is one continuous length, $18\frac{3}{4}"$ long. Each rear spar measures $9\frac{1}{2}"$ long.

It is best to make full size outline drawings of the wing on a clean sheet of paper tacked to your work bench. Lay both front and rear spars directly on top of their respective lines and place small pins at the tips of each end. The next step is to cut all the ribs to their respective sizes. Then, by placing them above a steaming pot or at a safe distance from a candle-flame, bend them to the camber shape shown in the plan. Cement each rib in place as soon as the curvature is obtained. The tips are made by bending $1/64"$ sq. balsa to the shape shown and then cementing them to the wing spars. Place a small pin on the outsides to keep the wood from losing its curve while the cement dries. Cover the entire wing with light jap tissue using banana oil for the adhesive. Crack wing in center and raise tips to a dihedral angle of $1\frac{1}{4}"$. Attach wing clips both in front and rear. These are shaped from .012 music wire and both are the same size.

TAIL PARTS AND FUSELAGE

THE rudder and elevator parts are made in the same manner as the wing using the materials specified in the drawing. The elevator has three ribs, each $1/64"$ by $1/32"$ when cut to proper length. Cover the elevator on one side only. The rudder is built directly on the tail boom. The tail boom consists of a strip of balsa $1/16"$ sq. by $6\frac{15}{16}"$ long. Attach the strips that comprise the rudder frame to the boom with a little cement. When the frame is dry, cover the rudder on one side only. The elevator should be cemented



Your finished product will look like this. Yep, she's mighty natty, and—but let's get busy windin' her up, for she's itching to head for the upper regions! (No, the wing isn't on backwards. It simply looks that way because of the dihedral.)

to the top of the tail boom, thereby leaving the rudder pointing downward as shown in the photograph and drawing.

The fuselage is simply a strong, but light, balsa strip measuring $3/32"$ by $1/8"$ by $8"$ long. Fine sandpaper is used to round off the corners lightly. Attach the rear hook in position, as shown, and put the thrust bearing in its place. The thrust bearing on the model shown in the photograph was shaped from an ordinary pin, which serves the purpose well. Yours may either be made in the same manner or bought. The next step is to cement the tail boom to the motor stick, as shown in the side view plan. Push a tiny pin through each piece to hold them together while the cement hardens. Remove pin later and fill the hole with a touch of cement.

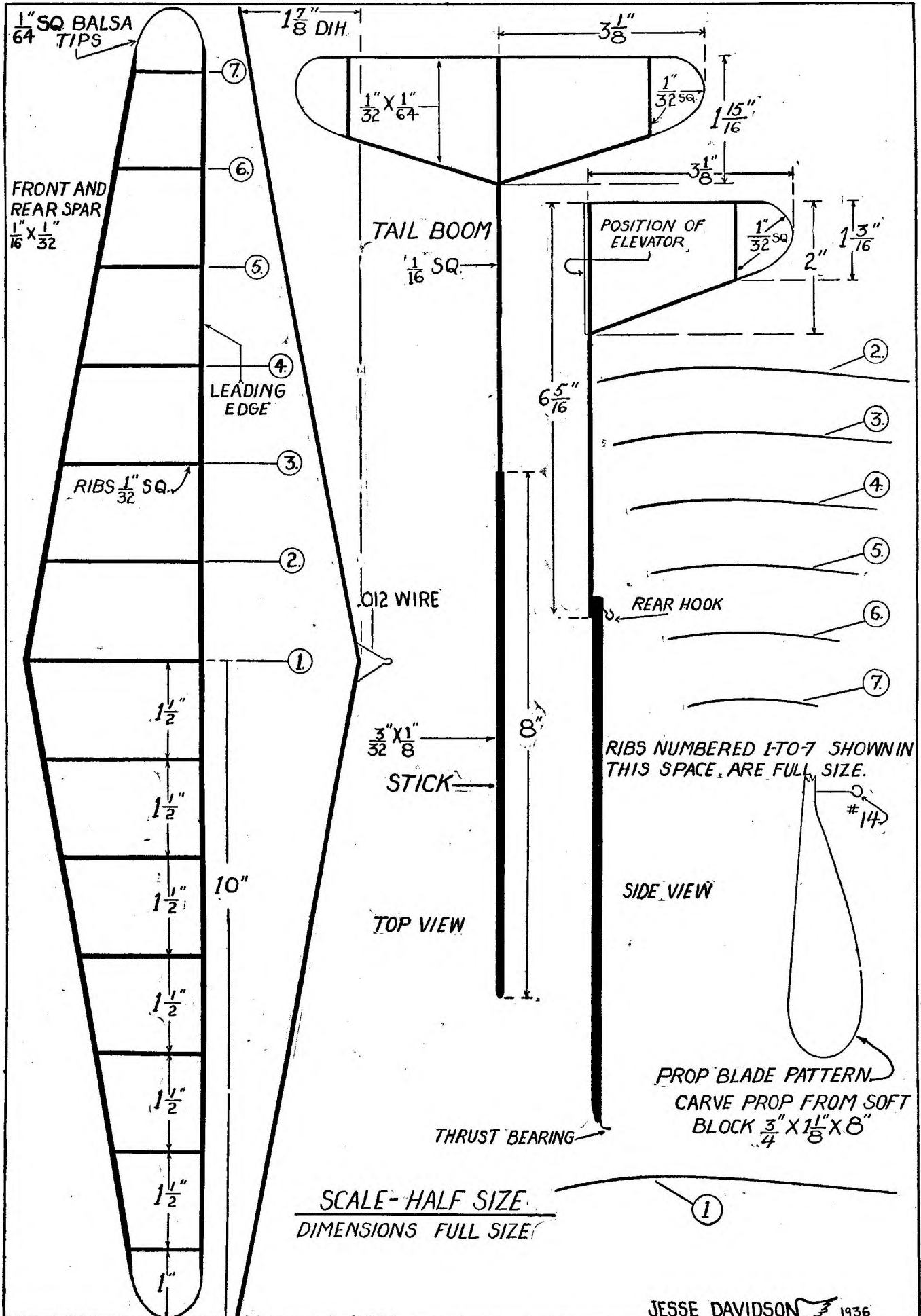
PROPELLER

CARVE the prop from a soft balsa block measuring $3/4"$ by $1\frac{1}{8}"$ by $8"$. Exercise care in this undertaking, then sand the prop down to $1/32"$ thickness. Good performance depends upon a perfectly balanced prop. Shape the prop shaft from No. 14 wire and insert in center of hub. Apply a little cement. Two small brass washers are then slipped onto the shaft. For motive power use two strands of $1/32"$ sq. rubber. Obtain a length measuring $17"$ long and tie the ends together tightly. Before placing the rubber in position slip the wing on first. The prop and the motor are placed in position next.

Glide the model to find the best gliding angle. If the model stalls, shift the wing back; if it dives steeply, move it forward. Test the model until a long, slow, even glide is obtained. On the motor stick, mark the points where the wing clips are located, so that when the model is again assembled for flights, it will be easy to adjust the wing. If the model is to be flown outdoor, choose a warm and breezeless day.

Coming next month—How to make a model of the Wright "Cyclone" engine!

FLYING ACES INDOOR TRACTOR



Some Notes on Indoor Contests



Robert Keegan "winds up," pitcher style, preparatory to tossing his glider. His ship tied for first, at New York, with 42 seconds.

By Frank Zaic
and Associates

MODEL builders in and around several large cities throughout the country did very little eating on Thanksgiving day. In fact, the only part of the turkey they were interested in was the wishbone. All this is by way of saying that several indoor model contests were held on November 29th and 30th.

Here are a few highlights on some of the contests:

The New York Junior Birdmen meet was held under adverse flying conditions. The weather was cold and the 165th Regiment Armory was literally full of "ups" and "downs"—but mostly "downs." This was undoubtedly the cause for the poor time in the powered model classes.

But the bad weather appeared to have little effect on the gliders. Two builders, Robert Keegan and Henry Struck, tied for first place with flights of 42 seconds (see photos). In spite of the poor conditions, Henry Struck also managed to get a winning flight of eleven minutes from his fuselage model.

The Chicago contest was held in the

You should not expect your models to break flying records during the Winter—especially if you live in the North. If your craft does half of record time, you can be sure of placing among the winners. Here are some of the reasons why.

132nd Armory. This building has a 90 ft. flying ceiling. The temperature in the building was near freezing, hence the powered planes were badly handicapped. The Tractor event was won by Vladimir Vana with a flight of only nine minutes thirty-six seconds. The winning time in the Fuselage event, won by William Gough, was also low—nine minutes and twenty-six seconds. As in New York, however, the gliders seemed to be unaffected by the bumpy air. Thus Wallace Simmers made the remarkable time of 51 seconds. The Chicago glider durations were so good that a builder doing less than 47 seconds didn't even have a chance to place.

The best glider time of the series was made by R. T. Rickard of San Antonio with a time of 52 seconds!

WINTER INDOOR FLYING

WINTER flying presents new problems for the model builder. Outdoor flights are passe, except for the builders in the more southerly portions of the country. Turning to indoor flying the average outdoor builder finds himself at a loss in this new medium. In view of this, here are some hints that should result in better winter flights.

Indoor flights in Winter are affected by gusty, draughty, and cold conditions. These factors require ships constructed with certain features in mind. Essentially, the ships must be strong. Because of gusts the ships must be able to withstand sudden displacements without washing-out. Cold armories mean cold fingers and a strong ship often prevents disastrous accidents resulting from frozen digits.

Since Winter is essentially a season of low pressure, air density is less than usual, making propellers and wings less efficient. To overcome this, it is necessary to overpower your ships. Small propellers and strong models will be found best. A small circle flight is ad-



Here's Henry Struck holding his glider. It equalled the 42-second mark. And at the right may be seen the nose of the fuselage model with which he did 11 minutes. That's serpentine and confetti that they've thrown in Henry's hair.

visible, as a large one will often jeopardize a flight because of drift caused by the difference in the inside and outside temperatures. The cold outside air cools the roof, which in turn cools the air at the ceiling and causes this air to drop to the floor. This air is warmed at the floor and rises along the sides to the roof. Although it is risky to try it, you may get excellent flights at the sides of an armory—if you are willing to chance a bit of girder flying. But don't say we didn't warn you!

Rubber also behaves differently in Winter. It is more brittle and is liable to break more easily. Wind up for power (that is, cram the winds in while in close) so as to get a good climb in the initial stages of the flight, in order to get the model above the poor ground-currents quickly.

Microfilm, too, seems to be more brittle than in the Summer. This, along with cold fingers, should make you think twice before seeing how strong the film really is.

Lastly, don't forget the snow shovel, if as occurred three years ago in New York, the snow starts piling up from a crack under the door!

Model Builder's Workbench

(Continued from page 42)

button makes an excellent machine gun drum after the holes are filled and painted over. Bent common pins make good cocking handles or grips for machine guns.

6—Instrument boards may be simu-

lated by cutting a good grade of glazed white paper to the shape of a panel board, then drawing dial on same with India ink and pasting on a balsa backing. Cover the whole with a piece of cellophane to the shape of the panel. This gives a realistic glass shine to the dials.

7—Look into the use of these small ladies' dress snaps for possibilities on models. One section of a snap with a

hole punched through the little projection makes a fine combination prop shaft bearing and washer to glue on your nose block and the rear of the prop shaft hole, using regular flat 1/8" or 1/4" brass washers in between.

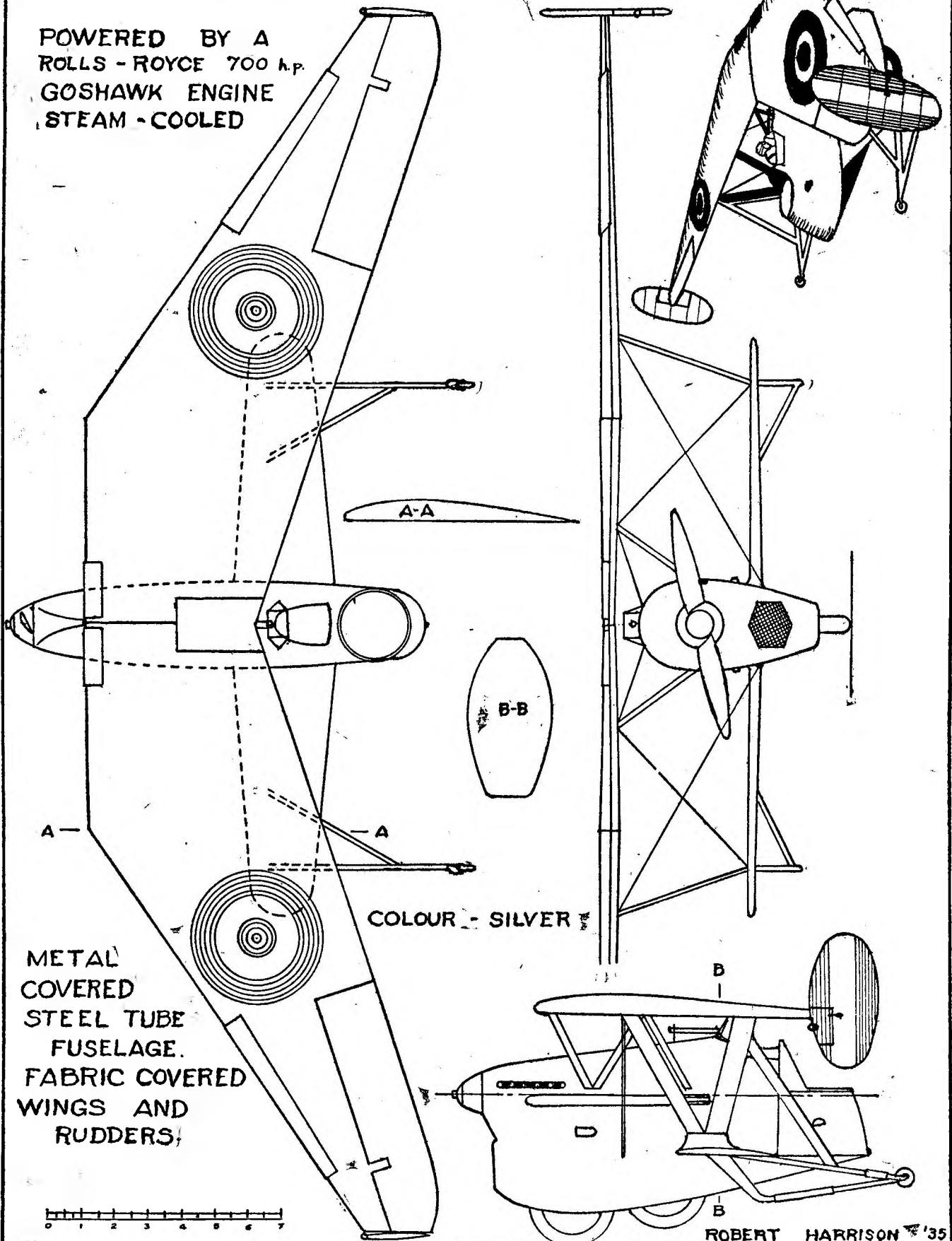
8—To protect the leading edges of your model's wings against those sad crack-ups that occur when your plane strikes a pole or similar object, you

(Continued on page 72)

Try a Solid Model of the Pterodactyl

WESTLAND PTERODACTYL V

POWERED BY A
ROLLS - ROYCE 700 h.p.
GOSHAWK ENGINE
STEAM - COOLED



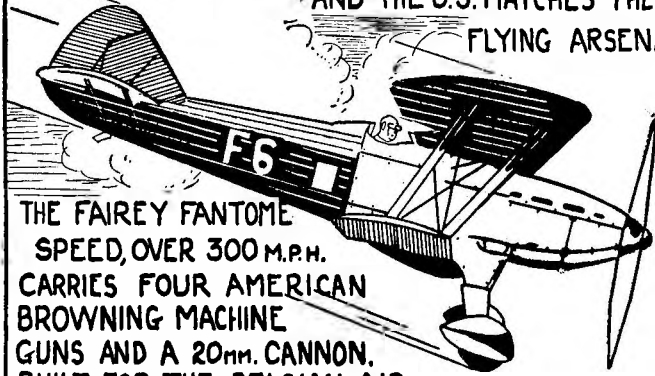
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America Knows the Answers!

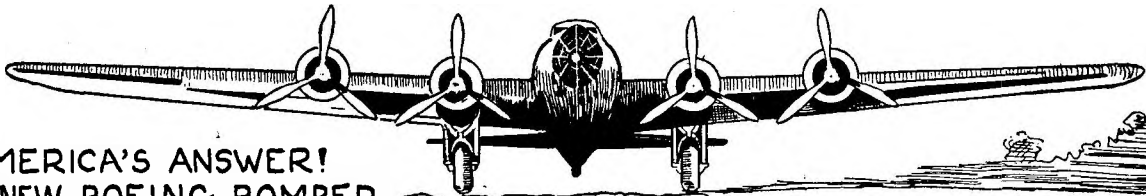
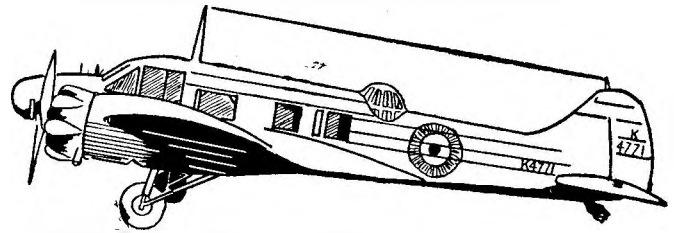
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THE WORLD IS WATCHING THE NEW TREND TOWARD MONSTER BOMBER-FIGHTERS AND THE U.S. MATCHES THEM ALL, WHETHER IT BE A FAST PURSUIT OR A FLYING ARSENAL.



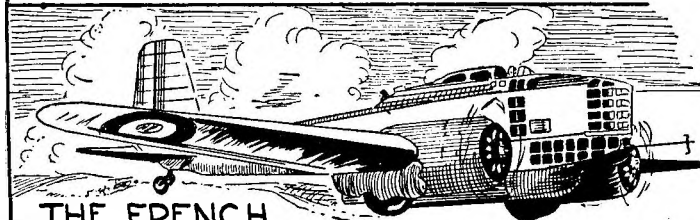
THE FAIREY FANTOME SPEED, OVER 300 M.P.H. CARRIES FOUR AMERICAN BROWNING MACHINE GUNS AND A 20mm. CANNON. BUILT FOR THE BELGIAN AIR SERVICE. QUERY:- WHY WAS IT TURNED DOWN BY GREAT BRITAIN?

BELOW:- THE LATEST AVRO 652, A LIGHT COASTAL RECONNAISSANCE BOMBER FITTED FOR SPECIAL DUTY IN COÖPERATION WITH COAST DEFENCE UNITS.



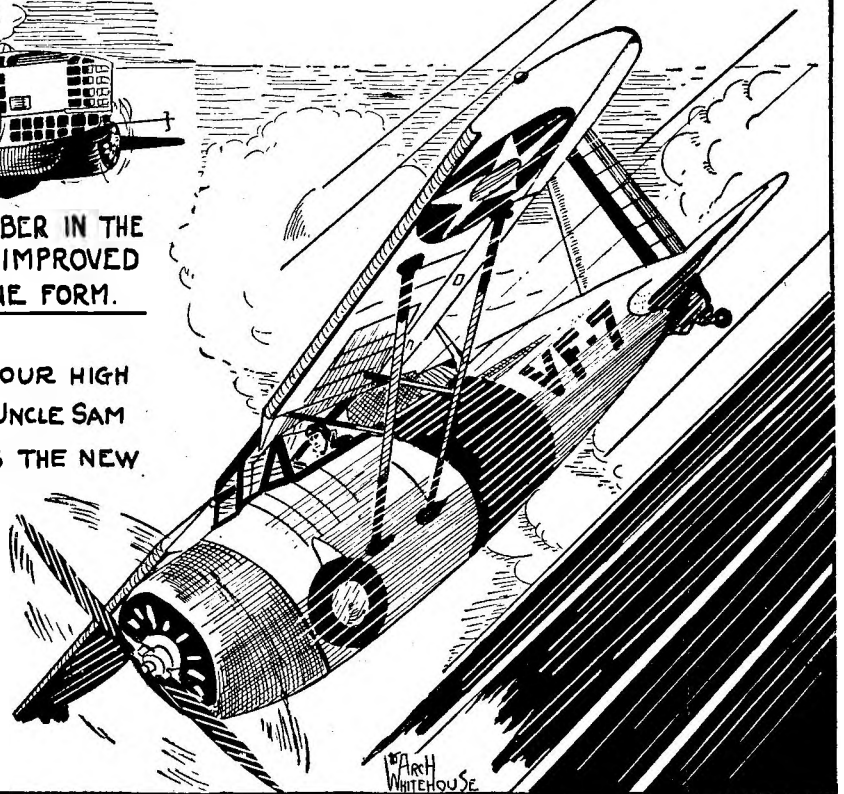
AMERICA'S ANSWER!
THE NEW BOEING BOMBER.

FASTER THAN ANY SERVICE PURSUIT SHIP. OUTRANGES AND OUTGUNS ANY FIGHTING SHIP KNOWN. IS THIS THE FUTURE BATTLE CRUISER OF THE AIR?



THE FRENCH CLAIM THEY HAVE THE FASTEST BOMBER IN THE WORLD IN THIS NEW BREGUET, AN IMPROVED VERSION OF THE 41-3 IN MONOPLANE FORM.

OF COURSE, IF YOU MUST HAVE YOUR HIGH SPEED SINGLE-SEATER FIGHTERS, UNCLE SAM MAY STILL CALL ON SUCH CRAFT AS THE NEW CURTISS XF13C-1 A NAVY FIGHTER BELIEVED TO BE THE LAST WORD IN FLIGHT-DECK PURSUITS. AND REMEMBER, THE NAVY AIRMEN ARE NOW THE FIRST LINE OF DEFENCE-MEN IN CASE OF AN ATTACK ON EITHER THE ATLANTIC OR THE PACIFIC COASTLINES.



The Armored Corpse

(Continued from page 6)

back to Private Little.

"It'll go easier with you," he barked, "if you explain everything. Why'd they try to kill you?"

Little had stood up, unsteadily. He stared at the G-2 chief with what seemed genuine astonishment.

"B-but I don't know, sir," he faltered. "I thought maybe you were going to tell me—"

"Why, you—" Jordan choked off, purpling. The private backed away, his lips trembling visibly.

"It's the truth, sir," he moaned. "Nobody believes me—my lieutenant said I was drunk—it's been like a nightmare, sir, ever since the first time—"

"Wait," interposed Strange quietly. He gave Jordan a significant glance, fixed his eyes on the enlisted man. "If you're innocent, you won't be harmed. Just answer my questions."

"Yes, sir," said Private Little huskily. Under Strange's hypnotic gaze he stood without moving.

"This is not the first time you have been attacked?" Strange asked.

"No, sir—it's the third time this week." There was something pathetic in the man's timid face. "The first time, I thought they took me for some one else—"

"Who do you mean by 'they?'" Strange rapped.

"I don't know even that, sir," Little answered desperately. "They're always in the dark—I didn't even see who got me tonight—"

"Look at this!" Strange whisked a sketch of Ludermann's face from the envelope out of his files. "Who's this man?"

Little slowly shook his head. "So help me, cap'n—I never saw him before."

"You're lying!" Jordan burst out fiercely. He shook his fist in the private's face. "Come through with the truth!"

Strange turned to the angry Intelligence chief. "He's not lying, colonel. Whatever it was the Germans feared, he doesn't even realize its importance."

"What do you mean?" snapped Jordan.

"I mean that somewhere, sometime, Private Little has seen or heard something of vital importance to Germany. Something they're afraid he may remember—or mention to some one who might construe it correctly."

Jordan glowered at the enlisted man. "Where are you stationed? What duty?"

"I'm just a clerk in the Quartermaster Department, sir," faltered Little. "I check blankets, mostly."

The jangle of the telephone cut into Jordan's snort. He stalked into the library, returned hastily after a minute. "We're both wanted at Headquarters," he told Strange. "This will have to wait."

"No, we'd better take him along," Strange muttered. "A few more questions may give us the answer."

He was silent for a few moments as

the G-2 car started toward G.H.Q. Then he turned to Little, who sat nervously between him and Jordan.

"Can you think of anything peculiar that's happened to you before these attempts on your life?"

"No, sir," said Little, unhappily. "I'm a sort of quiet fellow, cap'n—I don't get around much."

"Anything unusual before you came to France?" Strange persisted.

"No, cap'n, I was just a farmer out in Kansas, till th' draft got me."

"I tell you, Strange, you're barking up the wrong tree!" exploded Jordan. "The Boche obviously made a mistake in their man."

Strange did not reply. The car rolled past the first of the antiquated barracks which served as American Headquarters. The driver turned into the compound, slowed near the first entry. Strange turned to the private as they climbed out.

"Tell me this," he said as they walked, "has anyone ever threatened your life?"

Little started to shake his head, then by the glow of the headlights Strange saw a feeble smile come to his lips.

"Yes, come to think of it—but it don't mean anything. He just thought I was going to spill th' beans so he couldn't keep on fooling—"

"Who do you mean?" Strange asked quickly. "Where was this?"

"Well, it was down in the Vosges,"

Little began apologetically. "It was when I was there with—"

From somewhere in the dark compound came an odd hiss. Private Little's head gave a sudden jerk. Then his knees slowly buckled, and without a sound he pitched forward on his face.

CHAPTER II

THE CORPSE IN ARMOR

AS Little fell, Colonel Jordan started to spring toward him. Strange hurled him back, leaped to the side of the car.

"Cut off your lights!" he flung at the G-2 driver. He whirled and ran toward the nearest sentry-box. "Don't let anyone out! There's a German spy in the compound!"

Back at the car, Jordan was shouting for the guard. In a moment the headquarters was in an uproar. Armed men dashed to the compound entrances, to the outer doors of G. H. Q. Then at a dozen points, lights flashed on in the enclosure. While the sentries were searching the compound, Strange hastily knelt beside the dead private. A soft-nosed bullet had made a terrible hole in the left side of Little's head, high over his ear.

"The shot came from above," Strange said tensely to Jordan.

They ran into the building, and Jordan marshaled a searching party while Strange hurried upstairs. As Jordan rejoined him, Strange picked up a small

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black cylinder near one window.

"A lens cap," he muttered. "He was set for a long shot—but he didn't need it. We stopped within fifty feet of him."

"Must have been an air pistol," grated Jordan. "All I heard was a faint hiss."

Strange nodded grimly. "We're lucky, colonel. He would undoubtedly have killed us, too, if he hadn't heard poor Little's last words and realized that we didn't know the secret."

"The damned rat," rasped the G-2 chief. "If we grab him I'll make short work— Say, how did he know we were coming here?"

"Who sent that message?" Strange asked quickly.

"One of Thorne's aides—Major Bell. He said the general wanted to see us." Jordan stalked downstairs. Strange followed, and they found the plump Air Service aide out in the compound.

"Who else beside General Thorne knew you phoned me to come here?" Jordan demanded bluntly.

Bell's round eyes widened. "I didn't call you, colonel—and the Chief left five hours ago on a special mission."

Strange and Jordan exchanged glances. "They spotted that car I left in front of your place," Strange said sourly. "The rest is obvious. But we've still a chance to learn why they wanted to silence Little."

They left Major Bell and went up to the G-2 offices. Ten minutes later a flustered Q.M.C. lieutenant reported with several enlisted men who had known Private Little. Strange scanned the service record which the lieutenant had brought.

"Here it is," he said in an undertone to Jordan. "Detailed with 198th Casualty Company, near St. Evaux, May 3rd to July 18th. That's his only service in the Vosges Mountains."

Jordan frowned at the page. "That was before the Boche pushed through and took the East side of the valley."

Strange turned to the others. "Do you men recall anything unusual that happened to Private Little down at St. Evaux?"

"He kept pretty much to himself, sir," offered a skinny corporal. "Used to take walks alone—didn't drink or bum around in the village."

"There's one odd thing, captain," said the Q.M.C. lieutenant. "Little's pay record shows eight hundred francs set to his account on June 19th. He said he won it in a crap game, but these men just told me that Little never gambled."

The anteroom door opened and Major Bell came in. With him was a dark-haired man in a grimy flying-coat, with helmet and goggles dangling from a torn pocket. In the pilot's deep-set, weary eyes, Strange saw a haunted expression which reminded him of the unfortunate Private Little.

"This is Lieutenant Pierce," said Major Bell. "He has a personal message for you, colonel, from General Thorne."

The G-2 chief was reaching out for the envelope when from up in the night came the howl of a steeply diving plane. Strange stepped to the window, recognizing the static bellow of a Mercedes.

Through the beam of one of the hastily-manned searchlights fitted a dark shape. It plunged toward the old French barracks, then zoomed high above the main entry of G.H.Q. Something flashed down, a large twisted, shiny object, as the Boche ship went into a half-roll. There was a muffled crash, and the thing tore through the roof of a temporary building across the street. The dark plane rolled out into a chandelle, fled up into the night.

"Thank God it was a dud!" exclaimed Major Bell.

"That was no bomb," snapped Strange. He ran for the main entrance, shoved through the rapidly forming crowd. One of the men who had dashed out of the temporary offices seized his arm.

"Don't go in there—that bomb might explode!"

Strange pulled away, went into the building. The upper floor lights were out, but a sergeant with a flashlight was running toward the mail file-room. As Strange caught up, the other man halted in the doorway. He swung the torch, jumped back.

"My God!" he said hoarsely. "Look!"

Stretched there on the floor was a figure in ancient armor. The shining steel visor was jammed open. Gazing up sightlessly from a gold-embossed casque was a white, bloodless face.

"What's it mean, sir?" the sergeant whispered in an awed voice.

"I don't know," muttered Strange. He looked up at the jagged hole in the plank and tar-paper roof, then bent over the dead man.

"Why don't he bleed?" said the sergeant huskily. "Look at that cut on his face."

Strange glanced at the bloodless gash in the dead man's brow. It had evidently just been made by the edge of the visor. He touched the ash-white cheek. It was gruesomely cold.

"He's been dead at least twenty-four hours," he said in a grim tone. "That's why the cut isn't bleeding."

STRANGE'S green eyes swept over the fluted steel sleeves, the richly inlaid gauntlets, and back to the crest engraved in gold on the breastplate. The backplate and one of the leg greaves had burst open from the impact. He took the sergeant's flashlight, knelt for a closer look. Then a blank expression came into his face. The corpse in that costly armor was literally dressed in rags.

As he stood up, Colonel Jordan came panting into the room with Bell and Pierce behind him. Jordan and Bell both stopped in amazement. The dark-eyed pilot came to a halt, his thin face suddenly drawn and haggard.

"Another one!" he exclaimed hoarsely.

"Where else has this happened?" Strange rapped out.

"At the 55th Pursuit, down at St. Evaux—"

"St. Evaux?" barked Jordan. He wheeled to Strange. "Why, that's where Little—"

"I know," clipped Strange. He swung

back toward Pierce. "All right, let's have it."

"It was about two hours ago—around nine o'clock," the pilot said in a strained voice. "There was a crashing sound, and when we went out we found a dead man in armor—just like this one."

Strange pointed to the gold-embossed crest. "But not exactly like this," he said tersely.

"It looked the same to me," Pierce said uncertainly. "It was all smashed, but I saw a design of some kind."

"What are you driving at?" Jordan demanded of Strange.

Strange had knelt again, was removing the heavy casque. "Unless it's been duplicated, at terrific expense, this is the famous suit of parade armor used by Maximilian the First. I saw it in the Elsassisches Museum in Strassbourg, five years ago."

"Good Lord, it must be worth a fortune!" exclaimed the G-2 chief. "Why would the Boche throw it away like this?"

"The second riddle tonight," Strange muttered. "And here's a third one." He lifted off the backplate, exposing the tattered, dirty clothes. "Museum armor worth perhaps a quarter of a million dollars—and this poor wretch inside."

Jordan stared at the corpse. "Was the one at the 55th dressed like this?" he asked Pierce.

"Yes, from what I could tell, sir." Pierce shivered. "The body was badly mangled—" he broke off as Strange began to remove the loin-guards. "Better take my gloves, captain. You might get some terrible disease."

Strange sent him a keen glance. "Then something else happened down there tonight?"

"Three men died within fifteen minutes after that man in armor was dropped!" Pierce's eyes took on a sudden, wild light. "That drome is jinxed! Every day since we took over, some one has died or disappeared. We're all going crazy—"

Jordan hastily closed the door, motioning the sergeant to keep anyone from entering. "That's why General Thorne wants Captain Strange down there tonight?" he snapped.

"I didn't know what the message was," Pierce began. He jumped as the armor-clad figure slipped from Strange's hands and clanked onto its side. Strange gestured toward a hideous wound visible through the dead man's tattered clothing.

"A bayonet stab, if I ever saw one." He eyed the dirt-smear coat, stood up. "I'm afraid there's nothing else to be learned here."

Jordan gave orders for the room to be locked and guarded. When they returned to the G-2 offices, the senior M.P. officer was waiting for Strange.

"The rest of those spies carried away the two bodies," he said in a low tone. "But I think one was hurt before they escaped."

"Keep searching," Strange directed. The M.P. officer went out. Strange turned, saw that Bell and Pierce also had left.

"I sent Thorne word I'd rush some one else down there," grunted Jordan. "With Thursday's drive so near, I want you to keep after that information leak."

"I'd like to go to St. Evaux," Strange replied thoughtfully. "I can be back by noon tomorrow."

Jordan scowled. "All right," he said grudgingly. "But I think the Boche has gone looney—losing crack agents to kill a buck private. And now this business of dropping bodies—"

"German Intelligence is far from crazy," cut in Strange. "There's some purpose back of it. That's why I've a strong desire to see the other corpse in armor."

THE luminous hands of the gray Spad's tiny clock stood at 12:35. Philip Strange gazed down through the darkness, watching the gray ribbon which was the winding Moine. He had picked up the narrow river at Belcourt, now 6th Corps Headquarters. Following the old stream was the easiest way to reach the 55th at night. St. Evaux lay on the west bank within a fertile, circular valley which had long ago been the crater of a large volcano. During the ages, the extinct crater had become filled with huge rocks tumbling down from breaks in the wide cone. The Moine, flowing through a gap at the North, had gradually deposited rich soil on both banks until now community farms stretched away on both sides, almost to the frowning, jagged cliffs—except where the Germans had pushed through on the East and taken that barren slope.

Strange frowned absently at the stream passing beneath his wings. Of all the places for trouble to occur, St. Evaux was the least likely. It was a peaceful little village, organized for decades as a cooperative unit under control of the Jesuit monks, who also directed the working of the small silver mine outside and South of the valley. The villagers, he recalled, were fanatically religious and inclined to be close-mouthed with outsiders. But they were loyal to France, from the monks on down, and if violence had occurred he knew they could have had no part in it.

As he neared the northern entrance to the valley he pulled up to 2,000 feet, taking a good margin for going over the saw-tooth ridges. The pass, he knew, was only about 200 feet wide, with room only for a narrow road beside the river. Stars shone through wide breaks in the clouds above. He flew ahead for a few moments, estimating the point for a glide. The drome lay on a triangular section of ground just West of the Moine and close to the South pass. It was the only high piece of ground in the valley, and an old fort—now used by the monks as an abbey—stood on a massive rock along one edge, adding an extra hazard.

An S-turn in the river showed Strange that he was almost above the village of St. Evaux. He was starting his glide when from the direction of the field a red pinpoint of light began to blink. Above the pop of his idling

engine he heard a swelling roar. He hit the throttle, banked swiftly in a chandelle. The next instant a parachute flare blazed out half a mile away. The white radiance lit up the village as under a noon-day sun.

A lone Spad was diving toward the triangular drome, and Strange guessed instantly that the pilot was Pierce, who had taken off just a few minutes ahead of him, at Chaumont. For a moment he thought the roar had come from Pierce's ship. Then like dark vultures out of the night, three black Fokkers pitched headlong at the plane below.

Pierce twisted frantically to one side. Strange jammed the stick forward, and the gray Spad screeched down the sky. The pressure was already up. He jerked back the charging handles on the blue-black guns, tripped out a swift warming burst. Five hundred feet below, the leading Boche zoomed steeply after a hasty burst at Pierce. Strange ringed one of the other black ships in his sights. Two red streams poured from the throbbing Vickers.

The Fokker jumped like a stricken deer. Before he could finish it off, the pilot flung madly to one side and dived beneath Pierce's ship. The third Boche whirled in at Strange, Spandaus flaming. Tiny black holes stitched a deadly pattern along the Spad's right wing. Strange lanced up in an Immelmann, drilled down at the nearest Fokker. His tracers cut through the German ship's tail, but the Pilot rolled out desperately before he could flick them into the pit.

The flare was drifting against the ragged slope back of the old abbey. Strange had a glimpse of Pierce going down in a spin, then the parachute torch struck the rocks and dropped into a crevice. In the resulting gloom, the black ships were all but invisible. Strange kicked away as crimson tracer lines probed at him from the darkness. Another set of Spandaus blazed from behind him. He braced himself, looped with wings screaming. Spitting exhaust stacks showed for a second before his guns. His gloved hand snapped the trips together.

Br-r-r-t-t-t-t-t-t! One quick burst, and red flame licked out along the cowl of the hurtling ship before him. It grew into a seething inferno, dwarfing the brilliance of searchlights which sprang up from the Yankee drome.

The two remaining Fokkers charged in furiously. Strange reversed, stabbed two quick bursts at the ship on his right. The German skidded, dropped in a hasty turn. Wings grinding, Strange flung around at the third plane. The two ships raced toward each other, guns snarling. Strange crouched over the stick, his eyes slitted.

With a wild swoop, the Boche pulled up to escape headon collision. Strange rolled, caught the ship below in his sights. As he plunged, the Fokker which had zoomed, shot over in a loop and dived fiercely at his Spad. Tracers crackled past his head, tore through the cowl before him. He drilled a last fusillade into the man in front, then rolled hurriedly into the darkness.

Looking back, he saw his victim sag

down into the cockpit. The black Fokker reeled ahead for a moment, silhouetted against the falling flamer. Then the nose dipped, and with a rising scream it pitched down to a splintering crash. The third Boche banked hastily and raced into the East. His ship was swallowed up at once in the darkness.

Strange circled twice before nosing down to land. The flamer had struck close to the stone fence of the abbey burial plot, which lay about a hundred yards from the old fort and close to the curved base of the ancient crater. The blaze reflected from the white stone markers, sent weird shadows dancing among the graves.

Pierce had come out of the spin, was wobbling in to land. Strange saw his plane ground-loop through a searchlight beam, veer toward the row of huts and shops. As he himself landed he saw that Pierce's Spad had crashed to a halt with its right wing crumpled against the station's wireless mast. Several men were running toward the spot. He rudered in sharply, cut the switch. An ack emma appeared from a hangar, reached the wrecked ship a few yards ahead of him. The man jumped up on the step, then looked around startled.

"Hell's bells!" he exclaimed. "There ain't anybody in it!"

CHAPTER III

DEATH BY THE ALPHABET

"THE crash must have thrown him out," Strange said quickly. He hurried to the other side of the plane, but there was no sign of Pierce. The mechanic sprang down, a fearful look on his face.

"It's happened again," he said tensely as a second ground man dashed up. "Another man's disappeared!"

"Nonsense!" snapped Strange. "He's bound to be around here some place. That ship didn't land itself."

The ack emmas eyed him with an odd grimness.

"When you've been in this hell-hole a while," muttered one of them, "you won't be sure of anything."

Several men rushed up, their faces haggard, bloodshot eyes staring. Strange caught the reek of brandy from more than one breath.

"Pierce's ship!" rasped a hollow-faced captain. "By God, if he's dead the jinx is broken."

"He's disappeared," one of the greaseballs said tensely.

A drunken pilot lurched forward, his eyes glassy.

"So th' damn' louse has run out! Run out—an' a hundred men before it was his turn."

"Shut up, Burton," whispered the captain. "Here comes General Thorne."

"Who cares?" cried Burton shrilly. "I'm gonna die—I'm next on th' list—"

Thorne pushed into the group, and Strange saw the hard set of the fighting old veteran's jaw. Back of the general he was surprised to see Tom and Noisy Jay, his own twin aides. Thorne gave him an almost imperceptible nod of recognition, motioned to the Jay twins.

"Take Lieutenant Burton inside and keep him guarded," he ordered gruffly. "Now, Captain Irving, what's wrong here?"

"It's Pierce—he's gone, sir," said the hollow-faced officer.

"Get your men busy searching," snapped the Air Service chief. As the crowd scattered, he drew Strange aside. "If this thing isn't figured out soon, half the men in the squadron will be in strait-jackets. Pierce told you the details?"

"Very few," said Strange. "We were in a jam on something else."

He tersely explained about Private Little. Thorne's shaggy brows drew together.

"Strange, this thing gets more twisted every minute. Not ten minutes before you landed, Jordan told me that two more men in armor had been dropped."

"Beside the one at Chaumont?" Strange exclaimed.

"Yes, he told me about that, too. The others were dropped at Chalons, and up at Arras."

The crash truck rumbled past. Strange turned. A searchlight marked a spot on the bank of the Moine. The second Fokker had struck not far from the big rock on top of which the old abbey was perched.

"If that pilot's alive," he said to Thorne, "he'll be our quickest lead."

Thorne nodded, and a few moments later they were crossing the field in a squadron car with Strange at the wheel. The searchlights swept the ground, now and then lanced skyward.

"Queer about those Fokkers," said Thorne, thoughtfully. "There's no *staffel* of black D-7's near here."

"I've a hunch we'll find something a lot queerer than that before we're through," Strange answered.

"There's plenty already," growled the general. "Eleven men have died or vanished since the 55th took over. And I know now why the French shoved it onto our hands. There's a row of French graves in that little woods near the river."

"Alphabetical, too?" said Strange.

"Pierce told you that much, then?" demanded Thorne.

"No, it was obvious from what Burton said."

"Well, you're right. The first man to die was Sergeant Adams. He'd been acting peculiar for two or three hours, and suddenly he began to rave—fought off everyone who tried to hold him. He died a few minutes later. That night a mechanic named Armstrong died the same way. A third man, named Arthur, disappeared before dawn. I suspect he deserted, thinking he was next."

"All the deaths didn't occur on the field?" Strange asked sharply.

"No. Two pilots crashed in the mountains—"

"No Boche near them?"

"Not a sign. And tonight I saw three men die, raving mad, a few minutes after that man in armor was dropped."

STRANGE gazed ahead thoughtfully. The abbey took form from the shadows, its crumbling gray battlements

rising high above the massive rock which was its base. Two hundred feet beyond the old building loomed the curved, frowning walls of the ancient crater, its broken and jagged top hidden far up in the night. The car bumped along beside a stone wall which ran parallel with the crater's base, enclosing the monks' private burial lot. Outside the wall, just ahead of the car, several desolate graves could be seen, where the dead of the 55th had been buried.

"I'm not easily affected," Thorne said in a husky voice, "but the sight of those markers gives me the creeps. Look at them—Adams, Armstrong, Arthur, Ayles, Baker—it's like a roster of death."

"The precise effect that—" Strange stopped as a shrill, eery cry rose upon the air. It came from the direction of the wrecked Fokker—a wild shriek like the laugh of a madman. He drove close to the wreck. The crash squad had already lifted the pilot from the battered plane, and a stocky medical corpsman was giving him first-aid. Several black-garbed Jesuits had come down from the abbey, robes and cassocks awry from hasty dressing. As Strange and Thorne reached the spot, the German gave another screaming laugh. Two of the monks crossed themselves hurriedly. A wild glare came into the dying man's eyes.

"Blue—everything blue!" he said hoarsely. "*Ach, Gott*—it was a trick—" he fell back, moaning. The corpsman looked up at Strange.

"He's about done for. If we move him, it'll only be that much sooner."

Strange knelt by the German, saw the blotches of color which mottled the man's chalky face. He touched the sweat-beaded forehead, found it almost icy cold. He turned swiftly to the corpsman.

"Any adrenalin in your kit?"

"Yes, but his heart won't stand it," the man replied.

"It's the only chance to save him," rapped Strange.

As the corpsman reluctantly took out his syringe, the pilot's eyes opened. A look of terror came into their glassy depths.

"It's all blue!" he cried wildly in German. He pulled himself up, glaring into space. "Von Falke, you've killed me, you fiend!"

Strange started as he heard that name. Thorne looked at him quickly.

"What did he say?"

"He mentioned the name of von Falke—I've an idea he means Count von Falke, the 'ghost spy' of the K.N.A." Strange wheeled to the corpsman. "Hurry up, this man must be saved."

But even as he spoke, the mottled color went out of the German's cheeks and his breath began to sound harshly from his throat. At that unmistakable death rattle, one of the solemn-faced monks leaned over the dying man.

"*Deo volente, vade in pace,*" he began hastily in Latin. He started to make the sign of the cross on the pilot's breast, but the German had already ceased to

breathe. He stood up, his black cassock hanging back from his partly shaved pate. "*Eh, bien,*" he said gloomily, "I tried to do my duty, even though he was a German."

Strange forced himself to the task of searching the dead man, but he found nothing of importance. Thorne followed him as he went to the wrecked Fokker.

"What did he say about von Falke?" the general asked.

Strange translated the German's words for him. Thorne stared.

"Bowman had that same delusion before he died tonight," he exclaimed. "And Irving said it was the same with Sergeant Adams."

"Good Lord!" Strange muttered. He whirled to the crash squad. "Bring the body to the drome." Snatching up the astonished corpsman's medicine kit, he ran to the car.

"You think you've figured out this affair?" Thorne demanded as the machine rolled swiftly across the field.

"Only one small part of it," Strange answered tautly. "General, I'd advise getting another squadron and some machine-gun companies down here as quickly as possible."

"Why?" barked the Air Service chief.

"The Boche must have something of tremendous importance connected with St. Evaux. The killing of Private Little is proof enough. Added to that, these deaths—obviously a trick to get the drome abandoned. And then those men in armor—everything points to some scheme the Germans are trying to cover up."

"What about the men who were dropped at G.H.Q. and at Chalons and Arras?" objected Thorne.

Strange stared ahead into the gloom.

"Unless I'm mistaken, it's the old magician's trick— attract attention from what you're trying to hide. Something caused the Boche to rush to the museum in Strassbourg, take that Maximilian armor, put a dead soldier dressed in rags inside it, and drop it where it would get the most attention, in Chaumont. The same, probably, at Chalons and Arras. The only answer is that they don't want G-2 to focus on the one here at the 55th."

"Then why did they drop it here?" growled Thorne.

"It must not have been done on purpose. That's what makes it so important to see this man and the armor. It may give us a clue to their scheme."

"What the devil could they be up to?" demanded Thorne. "This is the roughest part of the Vosges. The scrap they had in taking that opposite slope proves it's impossible to push a drive through here."

"I don't think it's a drive." Strange swung the car in toward the row of buildings, turned suddenly to the general. "You said that Colonel Jordan called you ten minutes before I landed?"

"No, I called him to see if you were on the way. Pierce was an hour and a half late in reporting back."

"An hour and a half! What time was that man in armor dropped here?"

"Right after dark—about ten to eight," said Thorne.

"So that's why he disappeared!" rasped Strange. He jerked the car to a halt near the squadron office, and they hurried inside. "Any trace of Pierce?" he demanded of Captain Irving.

"No — whatever got the others must've got him—" began the hollow-faced C.O.

"He ran for it because he's a Boche spy," snapped Strange. "Flash word to the machine-gun companies holding the front here in the valley. Get every man on the field hunting for him. Phone road patrols at both North and South passes."

IRVING gulped, went into action. Strange wheeled to Thorne. "General, can you show me where that dead man was taken?"

Thorne led the way toward a gloomy portable building beyond the supply sheds.

"There it is—the place has become a regular morgue tonight."

A nervous sentry admitted them into the two-room shack, the front section of which was empty. The man led them back to the rear room, which was lit by a sputtering candle. Two crude pine coffins stood along one wall. On planks supported by saw-horses were three sheet-covered forms, and on the other side of the room—a blood-stained hand of armor protruded from under a blanket. Strange lifted one of the sheets, quickly lowered it and turned to the sentry.

"Find Lieutenant Burton and the two officers guarding him. Tell them to come here at once. I'll be responsible for your leaving post."

"What's the idea?" grated Thorne, as the sentry left. "You'll drive Burton into hysterics, bringing him here."

"And save his life," Strange said grimly. He laid the medicine kit on a table. "Also we may learn who poisoned these poor devils." He pointed to the three bodies.

"Poisoned?" ejaculated Thorne.

"No doubt of it. There are several vegetable poisons and at least one alkaloid which paralyze the optic nerves. In large quantities, they will make the victim see just one color. If Burton has been given any, it was only a moderate dose, or he'd be dead. Probably the killer slipped it into his victims' liquor, or maybe in their food. By varying the amounts, he could be sure they would die in the order he wished. But tonight he must have given terrific quantities to these three men — so they would die swiftly and keep everyone from thinking about this other matter."

Strange drew aside the blanket as he spoke. He grimaced as he saw the battered thing which lay there in crumpled armor. Steeling himself, he knelt for a closer inspection.

"Early sixteenth century armor — fluted plates," he muttered. "No crest — Herr Pierce lied about that. Nothing outstanding—" he looked at the closed visor, glanced up at Thorne. "The face was mutilated, then?"

"Not badly," said the general. "That must have been closed by accident."

Strange lifted the visor. As he saw

the pale and agonized face of the dead man he gave a stifled exclamation of surprise.

"You know him?" Thorne said eagerly.

"Jean Fourrier, one of the *Surete's* greatest agents," Strange answered. He closed the casque and slowly stood up. "General, this proves my hunch was right. Those others were corpses in armor, hastily dressed like him—in rags. Jean was alive when he struck."

"But why in Heaven's name would they go to such fiendish lengths?" exclaimed General Thorne.

"He wasn't dropped—they wouldn't try so desperately to cover it up if he were." Strange's green eyes were fixed in space. "He was probably struggling . . . he fell before he could catch himself . . . but why would a man in armor be in a plane?"

Thorne turned abruptly toward the front room.

"I'm going to send for those reinforcements. This is getting under my skin."

AS he opened the front door, wrangling voices became audible. The Jays appeared, dragging young Burton between them. Thorne scowled.

"Go easy with him," he grunted at Strange, and stalked off toward the squadron office.

The Jays brought Burton into the barren front room, Tom Jay lighting the way with his flashlight.

"Let me alone," the frightened pilot cried. "For God's sake, why are you torturing me like this?"

Strange closed the door.

"You don't have to go any farther," he said gently. "I merely want to give you some medicine to quiet your nerves — and to explain how those others were killed."

Burton shrank back against the door, his eyes wildly dilated.

"You're lying!" he cried. "You know I'm going to die—everyone knows—"

"We're only trying to protect you," Strange replied soothingly. "I had you brought here so it would save time, and not tip off the spy back of this."

"Lies—more lies!" screamed Burton. "You've brought me here to die! You're going to put me out there with—" he gave a convulsive start, stiffened before their eyes.

"Burton!" Strange clipped out sharply.

A single gasp came from the pilot's lips, then his head sagged forward. He went limp in the Jay twins' grasp.

"He's dead!" Noisy said hoarsely.

"He can't be," whispered Tom. "He'd fall."

Suddenly, ominous red drops appeared on the floor back of Burton's feet. Strange sprang toward that oddly huddled figure against the door.

"Get back!" he flung at the Jays. He seized the knob with both hands, jerked open the door, pulling Burton with it.

"Good God!" Noisy Jay cried out.

Driven through the door and into Burton's back was the blade of a bayonet. For the fourth time that night, Death had struck by the alphabet!

CHAPTER IV

THE MAN IN THE COFFIN

STRANGE saw his own horror reflected in the Jay twins' eyes. "They got him," Tom Jay said, white-faced. "They got the poor fellow—and we were supposed to be guarding him."

"It's not your fault," Strange rasped. "It's mine!" He pulled a gun from the spring holster under his left arm. "Noisy, spread the alarm at headquarters. Tom, come with me and—"

From somewhere back of the end hangar two pistol shots blasted into the night. Tom and Noisy both whirled and dashed in that direction. Strange started after them, halted with a muttered oath. The killer couldn't have reached that hangar in those few seconds . . . An accomplice must be trying to draw them away.

He swiftly retraced his steps. He made a hurried circuit of the building, re-entered the front room. Burton still hung against the opened door, pinned there by the blade which had been so viciously plunged into his back. His white face seemed to reproach Strange for his death, and a wave of self-denunciation swept over the G-2 ace.

His eyes were stony as he pulled the dead pilot free of the bayonet and laid him on the floor. It was too late for even regrets—but there was such a thing as vengeance. Grimly, he went into the rear room. A quick glance showed him the room was empty. He was half-way to the back door when the odor of gasoline came to his nostrils. He spun about, saw a pile of dripping waste near an overturned can on the floor.

In the same moment a sudden feeling of menace rushed over him. He wheeled, automatic half-raised, then froze. The lid of one coffin had lifted, and poked through the aperture was a hand with a black air pistol.

"Don't move!" snarled the man in the coffin. Strange could dimly see two eyes glittering in the candle-light. There was a brief hush, then from out on the field came the hue and cry of the searchers. The snout of the air-pistol twitched a fraction of an inch.

"Move back two steps!" ordered the hidden man. "Lay your gun on the table—there by the candle where I can see it."

Strange silently obeyed. The voices outside grew louder.

"Turn around," grated the other man. "Move back this way. When those fools come in here, get rid of them! You'll be covered every second. If you tell them I'm here, I'll kill you."

Strange heard the lid squeak, but knew it had not closed entirely. He could feel the man's eyes drilling into his back, through the slit. The angry voices of Captain Irving sounded at the front of the building, as the C.O. paused near Burton's body.

"If we catch that damned Hun, I'll kill him with my own hands!"

"Too bad the general didn't tip you off sooner that Pierce was a spy," said another voice.

Irving appeared with two armed pilots, just as a little group of ackemmas came to the rear entry. He started, then recognized Strange.

"Oh, it's you," he said harshly. "I thought maybe that butcher Pierce had ducked back in here."

Strange grimly risked a nod, but the C.O. saw in it only an acceptance of his words. The others were looking in morbid curiosity at the sheet-covered forms and the partly exposed figure in armor. One of the pilots shivered.

"Come on," Irving ordered gruffly. "We'll search the supply sheds."

They tramped on out. As their voices died away, the lid squeaked open. Boots scuffed, and in a second Strange felt the air-pistol rammed into his back. The other man prodded him forward, moved around him suddenly to seize the automatic on the table. The flickering candlelight fell on the bare head and thin, hard face of the man who had called himself Pierce.

"A good thing that blockhead did not catch your signal," he snarled. He took a step closer, shoved the air-pistol into Strange's ribs. "Now, what is the message your *verdammt* general is sending to Chaumont?"

"I don't know of any such message," Strange answered coldly.

"Don't lie to me!" said the spy fiercely. "He ordered a plane started and a pilot to stand by. What is that message?"

"That Jean Fourrier was killed by German agents because he learned the secret of St. Evaux," Strange calmly invented.

All the color fled from the spy's thin face.

"You *Teufel!*" he said in a voice thick with fury. "I should have killed you tonight—"

"—when you murdered Private Little," Strange finished savagely as the other man broke off.

"It is not too late yet," the spy flung back viciously. He tightened his grip on the weapon. Strange's nerves were taut as high-strung wires, but his eyes did not shift from the German's face.

"You're counting on me to help you get out of here," he said with a mirthless smile. "Your bluff won't work, von Falke."

THE spy jumped as Strange spoke the name. "So that pilot lived long enough to talk," he muttered. His scowling eyes bored into Strange. "*Ach*, so it was only a guess after hearing him babble."

Strange smiled coolly.

"Too bad those Fokkers did not get you," von Falke said in a tone of repressed fury. "If I had only known they were waiting—"

The rumble of an engine being started cut into his words. A tense look shot into von Falke's dark eyes. He shoved Strange's automatic into one pocket of his flying-coat, covered the G-2 agent with the air-pistol.

"I'm going to escape in that ship," he rasped. "And you're going out there to see that I don't fail!"

Strange made no reply. Von Falke

reached out and snatched his goggles.

"Give me your helmet," he ordered harshly.

Strange unbuckled the strap with a sigh of resignation. He lifted the helmet from his head, then with a lightning movement whirled it by the strap. Struck squarely in the face, von Falke jumped back with an oath. As Strange sprang aside, the air pistol gave a sinister hiss. A bullet snarled through the plank wall behind him.

The German tried frantically to recharge the weapon when he saw that he had missed. Strange seized the candle from the table, threw it into the pile of gas-soaked waste. There was a puff and a spurt of flame. He dived for the door to the front room. Von Falke gave a choked cry as the fire raced toward the overturned gasoline can. Strange heard him dash madly for the rear entrance.

The roar of flames grew louder. Strange was at the front entry when an explosion shook the walls. Smoke and fire belched from the rear of the building, billowed out after him as he ran to safety. He put a hundred feet between himself and the shack before stopping. As he whirled he saw von Falke race in the direction of the Spad which was being warmed up. Men were rushing for the blazing shack from all parts of the field. Strange sprang toward the first armed man he saw.

"Pierce—the spy—he's making for that Spad!"

The man swore, sprinted after the fleeing German. Strange jerked a rifle from a dumbfounded greaseball and joined the chase. Three crimson jets of flame showed against the darkness near the idling plane, and three shots cracked dully above the roar of the engine. Then the *Hisso* revved up to a furious speed, and the Spad hurdled its chocks in a wild jump.

The man ahead of Strange hastily bent over a figure on the ground, then whirled and fired at the Spad. Strange threw the rifle to his shoulder, pumped five shots as fast as he could. He thought the plane lurched, but a second later he saw it lift in a reckless climb. As he flung down the rifle, Thorne and the Jays came charging down the line. Strange hastily explained what had happened, his eyes grimly following the searchlights as they combed the night. Irving came up while he was speaking, and in a moment there was a ring of pilots and ground men. As word of the spy's escape spread, three or four pilots ran to their ships.

"No use to go after him now," grated Thorne. "He'll probably be over the line by—"

"Look out!" howled a startled mechanic. "He's diving for a strafe!"

WITH a sudden shriek, the plane lanced out of the darkness. In a second, it was evident that von Falke's target was the group of officers made visible by the burning shack. Strange raced for his ship, tossed a command at the nearest *aek emmas*. Behind him, ground guns went into snarling action as von Falke cut loose.

Two red streaks stabbed down from the nose of the Spad. A running greaseball pitched forward on his face. The German kicked sidewise, twitched his tracers over the crowd. A dozen men wilted to the ground, and screams of dying and wounded merged with the screech of the plane. Von Falke zoomed, whipped through a crossfire from ground guns, plunged again.

"By God, he must be trying to get you!" a voice rasped at Strange's elbow. He jerked around and saw Thorne. "He's trying to even things with you—or else he thinks you've learned too much," the general went on fiercely.

Strange jumped down from the step of his Spad, as a mechanic took the switch.

"I've learned this much, General—there's a Fokker *staffel* hidden within five minutes of here. Pierce—von Falke—gave away that fact. Those three D-7's were after me—and the only way they could have learned I was coming was when you called Jordan."

"Then there's a leak at 6th Corps, in Belcourt!"

"And a fast one!" clipped Strange. "The Boche knew instantly—"

B-r-r-r-t-t-t-t-t! The clatter of unleashed Vickers sounded from straight overhead. A hail of slugs pounded into the ground, ripped toward the ships on the line. A pilot toppled over in his pit. Two ground men fell, riddled. The strafe-ship zoomed with a terrific shriek of wings.

The man who had started Strange's engine jumped down from the cockpit. Strange was in the seat, taxiing swiftly in hardly more than two seconds. One other Spad had pulled away from the line, and a third was starting to move. Strange jammed the stick forward, hurriedly brought the plane to flying speed. Once those others were in the air, it would be almost impossible to tell friend from foe.

He held the ship close to the ground until the wings tugged wildly to lift. A shadow cut through a weaving searchlight beam, and the next instant von Falke dived headlong at him. Strange lifted the Spad a few feet, then sent it skyward in a furious chandelle. The German jerked out of his dive, probed futilely at the streaking plane. Strange half-rolled, tripped his guns.

A grim light came into his green eyes as he crouched behind the Vickers. Into his mind came an image of Private Little, with a look of dazed wonder frozen on his timid face . . . A picture of young Burton, huddled against the door while the slow red drops splashed the floor . . . Sheeted bodies side by side . . .

VON FALKE sheered out frenziedly under the fury of Strange's attack. In that second, only the dazzling rays of a searchlight beam crossing Strange's wing saved the German from doom. He shot into a loop, trying to drop on the G-2 ace's tail. But Strange had reversed at the moment of being blinded. As his vision cleared he saw von Falke hurl a short burst at a Spad

beneath. The Yank ship wavered in its steep climb, fell off to the left. Smoke began to pour back from the engine.

Strange charged back with a snarled oath on his lips. Von Falke skidded in a wild turn, and the tip of his wing came into Strange's sights. Strange squeezed his trips, and a fiery blast ripped into the German's ship. Von Falke zoomed madly, twisting into an Immelmann. Strange relentlessly followed through. As he closed the gap he saw the German cast a fearful glance backward. He smiled, centered the rudder.

Twin torrents burst from the chattering Vickers. He saw the tracers sweep in toward the crouching figure at the stick. Von Falke rolled frantically just as the deadly hail seemed about to cut him down. The next second his plane was whirling down in a violent spin. Strange dived, holding his fire. The spy was faking, he knew. And when he came out of that spin . . .

White light abruptly blossomed out a thousand feet above. Strange whirled around in the cockpit. A magnesium flare was slowly swinging earthward. And into that blue-white brilliance, six black Fokkers came screeching!

Instinctively, Strange started to pull out. But he had hardly braced himself when his mind revoked the command to his taut fingers. His salvation lay below. Eyes slitted, he plunged on after the spy. Von Falke had stopped spinning, was coming up from his dive. Strange kicked in so close that their wings almost scraped. The German whipped into a turn. Strange followed, guns silent.

In that tight circle, both ships were identical. The pilot of the leading Fokker veered out, staring from one to another. His indecision cost him his life. With a lightning swerve, Strange threw his suddenly blazing guns on the black D-7. The pilot half-rose under the impact of a dozen red-hot slugs. His ship went up crookedly as he fell back in his seat. The two Fokkers behind him spread out hastily.

Strange raked the nearer one with a furious burst, whirled back toward von Falke's Spad. The spy's guns blazed. Strange banked swiftly, drawing the German's fire as he turned. Von Falke crashed out another blast. On the instant, Strange flung into a tight reversement. Von Falke's guns spat their death-laden slugs almost through a D-7's tail. The Fokker pilot kicked around, venomously returned the fire. Von Falke signaled in panicky haste, but before the Boche pilot could whirl back Strange had him under his guns.

The Vickers drove a black trail up the Fokker's fuselage. Strange flicked the controls to register on the pit. Streaks of phosphorous shot past his head before he could finish the pilot. The Spad's tail shook under a furious pounding. He whirled into an Immelmann, stared back hastily.

Three of the black Fokker's had turned away to engage two Spads from the 55th. Two more Spads were zooming to join in the fight. The two remaining D-7's were following grimly on

his tail, with von Falke close behind. He cast a swift glance downward, saw the curve of the Moine. As tracers smoked past his head he jammed the stick forward. The Spad raced through a twisting searchlight beam, into the gloom beyond.

More tracers crackled past his ears. He hunched down, staring into the dark . . . counting the seconds . . .

Suddenly, the Germans' tracer lines seemed to stop short in mid-air. With a fierce lunge at the stick, Strange stood the plane on its tail, just as the crater's dark walls leaped from out of the shadows.

CHAPTER V

FOURRIER'S DISCOVERY

WHHEELS almost grazing the rocks, the Spad twisted up and away. A hundred feet below, there was a terrific crash as the first black ship hit the walls. Flame burst out, and by the red glare Strange saw the second German zoom insanely. For an instant he thought the man would escape from the death-trap he had set. Then the right wing hooked an outflung ledge, and the Fokker crashed to its ruin. Both ship and pilot vanished in a whirlwind of fiery wreckage.

As the first Fokker struck, von Falke banked away frantically. Strange rolled into level flight, nosed down at the spy. The stick had hardly moved forward when with a brief warning sputter the engine coughed and died. He hurriedly turned the reserve tank gauge, diving to keep the prop whirling. Von Falke had started to flee, but as Strange plunged below him he kicked around to attack.

The Hispano barked, but refused to pick up speed. Strange swore as the German's guns began to hammer. Von Falke must be almost out of ammunition—but it would take only one bullet if it hit the right spot. He ruddered sharply as the tracers smoked through his wings. The Hisso was beginning to rev up, but he was down to five hundred feet. If it didn't reach full speed in a second or two—

With abrupt decision, he swerved toward the base of the crater. There was a narrow space between the curving walls and the huge rock on which the abbey stood. After that scare above, von Falke was not likely to follow him there.

The flaming ruins of the two Fokkers were sliding down the crater sides. He could hear the reverberations echoing above the moan of his wings. The flames lit up the dark space behind the abbey rock. It was perilously narrow . . .

His engine suddenly caught and roared to full speed, but it was too late to turn. The Spad thundered over the edge of the Moine, where it ran by the burial plot wall. He saw the winding road by which the villagers ascended to the church which had been built at the rear of the ancient fort. The blaze from the Fokker wreckage made this later addition stand out incongruously from the grim old building. As the Spad plunged by, Strange was surprised to

see that the dome-roofed church was completely open on the side facing the crater. Rows of benches were briefly visible, and farther back two or three monks around a high altar.

The scene registered only a split-second on his mind. He was nearing the other end of the great rock—and von Falke would probably be waiting to pounce. But now he was ready.

Crack! Glass shattered almost in his face, and the compass bowl splintered into a thousand fragments. Bullet-holes ran a sinister pattern over the cowl. Astonished, he flung a glance upward. There was no ship above him. Another burst thudded into the turtleback.

He swept the stick to his chest. The Spad roared up before it came to the end of the narrow space. Black-garbed figures threw themselves down behind the notched stone walls of the old ramparts as he zoomed past. For a moment Strange could not believe his senses. The old monks—firing hidden machine-guns . . . firing on Allied planes!

Grimly, he swung back, in spite of von Falke's furious rush to cut him off. The spy's plane howled down as though for head-on collision. Strange clamped his trips, poured hot lead into the other ship's tail. Von Falke skidded, went wobbling up into a climb. Strange leaned over the side of his pit, staring down at the abbey.

Near the foot of a second road which led up to the abbey, four black-robed men were crouching. Part of one burning Fokker had fallen two hundred feet away, and the light reflected from something the men had just put down. Strange ruddered dangerously close to the crater walls, took a second look.

A pit had been scooped out of the rocky ground. He started as he glimpsed the pieces of metal piled beside the hole. Those four monks were burying suits of armor!

ATORRENT of tracerless bullets forced him to climb swiftly. From three points on the crater side of the abbey hidden machine-guns were trained on the Spad. He banked sharply over the top of the turreted old building. An ancient fort . . . why hadn't he thought of it before! There was a logical place to find medieval armor—even if it had been made into an abbey. And Jean Fourrier's body had been found within 900 feet of this spot.

He pivoted tightly, ignoring the scurry of dark-robed figures below him. There was only one way it could have been done . . . One possible way—unless the French agent had really been dropped from a plane. He nosed down, and the Spad thundered above the pointed turrets with hardly five yards to spare. At one spot on the East side, on a section of flat roof, canvas had been pulled over some bulky object. A long derrick-like beam protruded, where it had crashed into the masonry.

Strange's green eyes blazed. His guess had been right. It was an ancient ballista, a catapult machine of the type used in olden times for hurling heavy stones or balls of fire at an enemy.

Part of the tangled problem unfolded itself in his mind with lightning swiftness. Jean Fourrier had traced some desperate German plot to the abbey of St. Evaux. That meant the monks were spies—that the real Jesuits had been captured or killed. Fourrier must have gained admittance by some trick, probably had posed as a poverty stricken peasant living in the valley. The spies would have to keep up some pretense with the religious villagers Probably they had forced some of the real monks to hold the regular services under threat of death.

The swift flow of Strange's thoughts was cut off by an ominous howl of wings. He banked instinctively, looked back as the Spad chandelied. More black Fokkers had arrived from out of the eastern sky. A rocket was dying out, showing where von Falke had signaled two of them to the attack. Strange sent the Spad roaring through a searchlight beam, dived down the light until he was sure the Germans were blinded in following.

As he pulled out he saw a dozen Spads from the 55th battling fiercely with the Boche. Machine-guns from ground emplacements kept up a muffled clatter, blazing away every time a black ship was not too close to a Spad. Beyond, across the Moine, star-shells were bursting above the lines, as nervous infantrymen kept watch for a sudden push.

To land through that low-fought sky battle was all but suicide, yet Strange knew his discovery should be reported at once so that the spies in the abbey could be captured. He pitched down toward South Pass, was immediately cut off by two snarling Fokkers. Von Falke and the other two D-7's joined in a hasty attempt to hem him in.

Strange rolled with guns blazing, blasted one ship from his path. Fabric was hanging from his wings and the tail as he raced up out of the trap. A Spad streaked in to his aid, and he saw one of the Jay twins drop on a German's tail. Suddenly two more black ships detached themselves from the main fight, charged across toward Strange and the Jay Bird. Two Boche converged on the other Spad. Strange renversed savagely, drilled a hot stream through the side of the first German's pit. The second Boche chandelied fearfully, and then as though at a single command all five Fokkers shrieked after Strange's plane.

He whipped around, hoping to repeat his earlier trick as he raced toward the crater walls. But abruptly the Germans banked away—almost as one. Strange's eyes narrowed. They were being guided by some one who knew that trick. That meant wireless in all the Fokkers—but who was warning them? It couldn't be from a set in the abbey. The 55th operator would have heard such a station long ago.

The old fort loomed before him. The Germans were trying to force him toward the abbey, apparently hoping to crash him out of sight from the drome. He cast a quick glance down at the narrow passage he had tried before. It

was almost dark, with only smoldering ruins where the two wrecked ships had burned. With a flick of controls he sent the Spad roaring down into the shadows. His guns were almost empty At any moment a Spandau burst would get him if he tried to fight that pack. But with the dark to shield him there was a chance.

As he had expected, bullets unmarked by tracers began to chop at his ship as he neared the ancient fort. But there came a sudden break in that fire. Two thousand feet above the valley of St. Evaux, half a dozen parachute flares bloomed out with a dazzling radiance. Like rats scurrying for their holes, the pseudo priests on the ramparts dragged their guns from view and vanished.

For a second after the flares lit up, Strange could see nothing in the sky. Then blurred, fast-moving shapes were vaguely silhouetted as a score or more of Yankee Spads dropped out of the night. A thrill went over him. Thorne's call for an extra squadron had gone through!

Von Falke and the five D-7's zoomed in panic. Strange was almost half-way through the canyon-like space. He back-sticked, staring across at the abbey as the Spad soared. The first time he had passed, only a dim light had shone in the rear of the odd, open church. But now he saw a bright glow under the tilted dome. And by that light, as the Spad swept by, he glimpsed a curious sight.

CROWDED about the high altar were nine or ten black-robed figures. Two had their cassocks thrown back, and telephone headsets covered their ears. A third was wildly waving a paper in one hand. Above them, standing behind the altar, was the grim-faced man who had mumbled in Latin over the dying Boche pilot. His lips were moving frenziedly, as though he screamed to some invisible audience on the benches before him.

As the Spad thundered past, two of the group spun around, snatched guns from under their robes. But the ship was past before they could even take aim. Strange leveled off five hundred feet above the abbey, a blank look on his face. Something pounded at the back of his mind, telling him that he had learned the secret of St. Evaux—the secret for which Jean Fourrier had risked his life, and died.

He gazed back at the gloomy structure, saw the frowning crater walls beyond. For an instant he had a picture of the two blazing Fokkers, slithering down those grim dark walls. He sat up with a jerk, pulses leaping. The curious scene within the church came back in a flash.

He stared down to where the Moine wound close to the base of the abbey. As he banked for a race to the drome he remembered another building along the Moine—not far away to the North, the old inn at Belcourt, recently taken over by American 6th Corps for a headquarters, after the other had burned. With a triumphant gleam in his eyes, he nosed down toward the field.

Only four of the black Fokkers remained in the air, and they were fleeing desperately into the East. Below, battered ships and flaming wreckage testified to the vengeance of the Yank pilots. Strange gazed after the fleeing Germans, then slowly the triumphant light went out of his eyes. His hand shot to the throttle as that last trace of triumph changed to consternation.

If his guess were right, only terrific disaster for the Allies would follow the Germans' discovery that the secret had been learned. Von Falke was fleeing taking that word to Germany to the hidden base which must exist nearby. Once the spy landed with that message—confirming what they already must be fearing—the German High Command would unleash the forces they must be holding ready to strike.

But he was the only one who had seen—or guessed the explanation. If the Germans thought he was dead—

AT full speed, its riddled wings drumming hard, the Spad bored up through the smoke-filled sky. Could he find von Falke among those others? The Boche would be trying to slip away from the light, furtively, to avoid suspicion. Suddenly he saw one plane edging off to the North, almost in the shadow. He raced after it, one hand fumbling inside his flying-coat, where a compact make-up kit was hidden in the lining.

His fingers, trained to know the exact position of everything in that kit, came out with a small tube in their grasp. As he peered over the cowl, he saw the other ship climb abruptly. Two Spads without squadron markings were converging on it for quick inspection. Strange groaned as he recognized the Jay twins' ships. By a violent zoom, he managed to cut off the nearest one. Noisy's impudent face stared across, broke into a grin as Strange hurriedly signaled him.

Strange motioned him back, charged in at the fleeing plane. The pilot threw a startled glance over his shoulder, and he saw that it was von Falke. In the next moment, Tom Jay closed in swiftly at the left. The spy dived at once, trying to gain the protection of darkness. Strange stabbed a burst past his tail, and von Falke skidded frantically. Before Tom Jay could open fire, Strange hurled his Spad between Tom and the German. Tom rolled quickly out of his way, shaking his fist without recognizing the man who had blocked his aim.

With two ships on his left, von Falke swung instantly to the right as Strange had intended. Strange dived at full gun, shot almost into the spy's path as von Falke pulled up. The parachute flares had died out, but a dozen searchlights were pawing the sky. Strange saw the German's face distort with rage, and he knew the spy had recognized him or his ship. He thumbed his trips, sent a burst wide of von Falke's wings, then suddenly reached forward and pretended to hammer at a Vickers breach.

The spy renversed, and the guns on his cowl stuttered for an instant. Strange lunged back on the stick, threw

one hand up to his face. The open grease-paint tube squashed its red contents over his cheek. As his hand fell away, he saw von Falke stare back. He let his head sag forward, shifted stick and rudder. The Spad slued around, pitched off into a spin. He let it fall five hundred feet, slowed its wild gyrations. Looking up, he saw von Falke plunge off into the night. Guns blazing madly, the Jay twins followed on his trail.

Strange gunned the Hisso, climbed past two circling ships of the 55th. The Jays were almost lost in the gloom when he reached their level. Only occasional tracers, red in the darkness, enabled him to follow the three planes. Very little gas remained in his reserve, but he had to head off the Jays. They thought von Falke had shot him down, and he knew they were reckless enough to pursue the spy half-way to Berlin for vengeance.

The Spad roared across the five miles of St. Evaux Valley. Ahead, tracers again stabbed the night, lancing from three directions. Then darkness again. Strange thought he saw a ship gliding down in front of him. He was nosing down to catch up with it when his engine began to miss. With a muttered exclamation, he twisted back to the West. He was reaching for the flare release when the pilot below him dropped a flare.

The light showed an expanse of small fir trees and brush patches on a gradual slope descending eastward. In dismay, Strange realized he was above the reverse slope of the old crater. The jagged ridge lay a mile or more to the West, and he was only a thousand feet from the ground. As he headed for the rim, trying to stretch his glide into the valley, he heard Vickers guns rattle up in the gloom. That meant the man gliding beneath him was one of the Jays.

HE was at five hundred feet, and grimly holding the Spad to bare flying speed, when the other ship abruptly banked away from the crater ridge. By the flare, he glimpsed the squadron markings of the 55th. He stiffened. Von Falke's ship! The Jays were fighting each other by mistake, up there in the dark.

He had no time to reach for a Very shell and get out his signal gun. Hastily, he tripped his guns and swerved toward von Falke. If the Jays saw him attack the spy, they would realize their mistake. The Vickers pounded, but only for a moment. The slow-moving prop ceased to turn, and the blades stopped in "dead" position.

Von Falke apparently had not seen Strange's plane until the twin-guns flamed. He jammed the nose of his ship into a hurried dive, twisting away from the tracers. The maneuver, with a silent motor, all but sent him into a spin. But Strange had no time to observe the German. His own predicament had become desperate. The Spad was within three hundred yards of the ridge and settling fast.

In the last few seconds, he thought he was going to succeed. Then the

straggly fir trees seemed to leap up at him. He braced himself, pulled the stick back. Wings swaying, the Spad pancaked toward the ridge. With a crackling sound, the tail-skid raked through a branch. The nose dropped, ploughed through a group of small trees as though they had been fenceposts. Then with a violent whipping motion, the plane went onto its back.

Strange hung in his belt, half-dazed. The ship had ceased to move, but an odd rumbling sound filled his ears. In a moment he realized it was a minor avalanche the crash had started. He unfastened his belt, fell into a broken fir branch under the cockpit. More stones rattled down the slope, and suddenly the Spad began to move again. He clutched at the tree beneath him, hauled himself to one side as the crumpled ship slid over him.

With an ominous crack, a large piece of rock broke away. The tail of the overturned plane pitched down, then in a roaring of stone and uprooted firs the ship went plunging down into the blackness.

CHAPTER VI

THE WHISPERING VALLEY

UNTIL that instant, Strange had not realized that he had crashed on the edge of the rim. He lay there, staring down into the dark. Blood ran from a cut on his forehead, mingling with the grease-paint he had used to trick von Falke. He had been saved by a miracle, but the situation was still desperate. German machine-gun posts down in the valley lay between him and the Yank lines. It would take another miracle to get through them, even if he could find a path down the slope—and two miracles in one night were too much to expect.

He crawled sidewise to a ledge, made his way up the rim to a safer position. The flare von Falke had dropped was burned out. He could hear nothing of the Jays' ships. He got to his feet, was raising his sleeve to wipe the blood from his face when the sound of dislodged stones warned him that some one was approaching. He felt for his automatic, remembered the spy had taken it. He crept back of a clump of firs, barely hiding himself when a flashlight cut a path through the shadows.

"Be careful, Hildt," came the grating voice of von Falke. "If the Yankee is alive he may fire at us."

"From the noise it made," growled another voice, "the swine is probably—"

"Himmel!" exclaimed von Falke. "The plane went over the brink."

Both men stopped, and the flashlight played over the broken trees and displaced rocks. By the reflected glow, Strange had a dim view of a bull-necked *Leutnant* beside von Falke. The spy's clothes were torn, and he limped as he stepped forward to peer over the edge.

"Well, he will not trouble us now," Hildt said with a sour laugh.

Von Falke turned and stared into the sky.

"I wonder what happened to the other one," he muttered.

"There were two planes fighting just before you fell in the trees," offered the *Leutnant*. "One went down, and I think the other landed at the base."

"I must get there myself," said von Falke. "Help me find that path again—"

"You had better come to my post and let me phone for a car," cut in Hildt. "It can come within a hundred meters, by the camouflaged road."

The two men moved away, von Falke limping as Hildt lit up the way. Strange waited till they had gone a short distance, then followed warily. The Germans went along a path which meandered over the ridge and then led down on the valley side. Hildt had covered the flashlight to make only a faint glow. Strange kept as close as he dared, stepping carefully among the loose stones.

Hildt's light vaguely showed where branches of trees had been twined together at the top to conceal the path. About two hundred feet below the ridge, the path ended at a low-roofed log hut almost hidden among trees and brush. With a quickening of pulses, Strange saw that the side facing the crater walls was open, just as the abbey church had been. There was a light within the hut. As he tiptoed closer, he saw a crude wooden horn just outside, apparently discarded.

In the open section of the two-room hut was a table on which stood an amplifier and a large microphone. Both were tilted up toward the curving walls of the crater. A telephone stood at the rear of the table, and wires connecting through switches ran to a cable on the ground. Strange saw that the cable led along the path, up toward the rim. Just as Hildt and von Falke entered, a voice spoke from the amplifier.

"Rohrbach!" it rasped. "What has happened? Why don't you report?"

The words echoed from the crater walls. There was a pause as they died away. The two Germans stood in attitudes of tense expectancy, staring upward. Suddenly a whispered voice spoke from out of the night—a voice which Strange recognized as that of the pseudo monk who had stood back of the abbey altar.

"Half our agents have fled," it said harshly. "I have been trying to keep them here."

Von Falke sprang to the table, threw a switch* and snatched up the microphone.

"Rohrbach—this is Q-7!" he snapped. The words roared from the amplifier, up toward the curved rock walls. "I'm cut in at Post Number Two. Hold the abbey—there is no danger—I killed that *schweinhund!*"

The words had hardly ceased to echo when the telephone rang furiously. Von Falke turned from the microphone.

"Was ist? Ja, I am here at Post Two—I was forced down. I was going to report in a moment—"

Another pause, then the spy launched into a terse explanation of what had

occurred at the 55th. Strange could hear clearly, for the microphone caught the words and sent them, amplified, up against the crater walls. He knew now that his earlier guess had been correct. Those curving walls took the echoed words and sent the sound waves circling around the sides of the valley. The effect was a gigantic whispering gallery. As in smaller ones of which he had known, there were undoubtedly but two or three places where the sounds could be heard. This spot was one of the echo centers, and the walls back of the abbey rock probably constituted the other main one. The reason for the long wall enclosing the monks' private burial lot was now obvious. The sounds must be audible there, too. Mediaeval Jesuits had evidently stumbled upon the existence of the whispering gallery and had used it to delude the ignorant peasants by creating some apparently supernatural effect. The crude wooden horn showed that some one, probably a monk, had tried the phenomenon recently.

"I TELL you the Brain-Devil is dead!" von Falke's emphatic words broke in on Strange's racing thoughts. "What? *Nein*, no one else saw."

He put down the phone, motioned to Hildt.

"Switch the microphone back to Post One. General Bruck wants to contact the abbey."

Strange stole forward as Hildt obeyed. Both Germans had their backs turned.

"Rohrbach," the amplifier boomed out, "make sure that none of the enemy is near your echo spot, then continue the reports. Send information on the *Amerikaner* offensive first, all air force data especially. *Leutnant* Hildt, disconnect until the next report from the abbey."

Strange had reached the open side of the hut. His eyes were fixed on the Luger which Hildt had laid on the table. He was about to make a quick leap when Hildt disconnected and the general's words ended. In the abrupt silence, pebbles grated under his feet. He dived for the gun as von Falke and the *Leutnant* spun around.

A stunned look shot into von Falke's face as he saw Strange. Hildt plunged for his gun. Strange almost had it in his grasp, but the German's lunge sent the Luger thudding to the floor. He landed an uppercut, sent the *Leutnant* reeling. But before he could seize the fallen pistol, von Falke jerked out the automatic he had taken from Strange at the 55th.

"*Handen hoch!*" he snarled. The muzzle jabbed hard into Strange's ribs.

"Let me at that *Hund!*" roared Hildt. He made a clumsy swing which would have floored Strange if he had not jerked aside.

"Keep out of this," von Falke said fiercely. He glared over the gun at Strange. "So it was a trick—pretending you were dead."

Strange made no reply. Hildt, re-

trieving his gun, gazed open-mouthed at him.

"*Himmel!* Then *this* is the Brain-Devil?" he exclaimed.

"*Ja,*" von Falke said grimly. "And now that he's captured, I'm even better satisfied. I was afraid he might have lived long enough to talk."

"I've already talked, *mein Freund!*" Into the words, Strange threw a deliberate taunt. "I dropped a message to General Thorne."

Dark blood rushed into von Falke's face.

"You lying *schwein*—you never had time—you were chasing me!"

Strange smiled mockingly.

"Wait till they drag the Moine and find that cable leading to the abbey."

With a snarl of fury, von Falke leaped at him, gun raised for a murderous blow. As Strange had hoped, the spy's heedless charge blocked Hildt's aim. One lifted hand flashed toward the spy's descending arm. In the same second his right shot down and across in a jolting hook to the jaw.

Von Falke's gun hand tightened spasmodically. The weapon erupted with a roar, above Strange's head. As the spy lurched back, Strange wrenched the gun from his fingers. Hildt had jumped to one side, trying to level his Luger. Strange pumped two shots so quickly they were like one. Hildt tottered back, fell over a chair and crashed to the floor. The Luger slid under the table.

As Hildt dropped, von Falke whirled to the open side of the room. Strange blazed a shot toward the spy, but missed. With a quick glance at Hildt, he sped after the other man. Von Falke was half-running, half-limping up the steep, dark path. Suddenly he flung himself aside, and a rock came whizzing back at Strange.

Strange ducked, was starting on when von Falke gave a frightened cry. There was a smashing of brush, a rattle of cascading stones. The German's voice rose to a yell of terror, then ended abruptly. Strange made his way to the spot where von Falke had slipped from the path. A few pebbles were still rattling down into the blackness. Not even a groan came up from below.

GRIMLY, Strange turned away and hurried back to the hut. To his consternation the phone was on the floor near Hildt's stiffening hand. It was plain that the man had tried to send a warning before he died. Strange picked up the telephone.

"*Leutnant* Hildt!" a guttural voice was bawling, "What's happened there? Who fired those shots?"

Strange thought rapidly. The circuit to Post One was closed, also, no one at the abbey had heard the echoes of the conflict or the crater walls would be muttering out excited questions. He came to a quick decision.

"Post One!" he rasped, in an imitation of von Falke's hard voice. "Hildt has been killed. One of those accursed Yankee pilots crashed near here and sneaked up on us."

"*Mein Gott!*" shouted the man at the other end. "Then he learned the secret."

"Don't fear, I killed him," Strange grated back.

"Good!" said the guttural voice. There was a pause. "A car is already on the way. Connect the circuit, and meet the car at the end of the road. I will send another officer to replace Hildt in a few minutes."

Strange put down the phone, stood tense for a moment. He could escape before the Germans arrived . . . or he could stay and play a role which would probably lead to a firing squad. He cast a glance at his wrist-watch. Almost three o'clock. In just about twenty-four hours the Yank drive would begin. And if his suspicions were right, a German-made hell would break open before that time. Unless . . .

He wheeled to the table, hastily removed his flying-coat. He jerked open the pocket in the lining, snatched out the flat make-up kit. Propping a mirror before him, he set to work with flying fingers. A car was already on the way . . . it could not be more than a few miles to the German base. There was no time for careful preparation—but he *must* pass inspection.

Shadows grew upon his face, bringing hollows to his cheeks . . . swift-traced lines, creating the thin, hard look of von Falke . . . the pinched mouth and cold, deep-set eyes . . .

From over the ridge came the muffled sound of an automobile whining in second gear. Strange gripped a stick of purple greaseless paint, drew a blotch above and around one eye. A swift dab of collodion . . . the twisting of a red-smeared handkerchief—wet with blood from the cut over his other eye—and he was through. He put on the helmet with which he had struck the spy, looked sharply in the glass.

Von Falke himself appeared to look back at him—a von Falke with a bloody bandage drooping over one eye, and the other eye half-closed and purplish black as though from a blow. Only the closest scrutiny would show that his eyes were not dark like those of the spy. That was the weakest point of his make-up.

Hasty footsteps sounded on the path. Strange took a last swift check-up. The helmet would prevent them from knowing that his hair was not the black hair of von Falke. He wore captain's bars under his flying-coat where the spy had worn those of a lieutenant. But if his plan worked out, there would be no trouble there.

He scooped up Hildt's Luger, put it in his left-hand flying-coat pocket. The other gun was in his right, and he was pretending to finish a sharp conversation by phone as the first German arrived.

"—never mind, here they are now," he snapped, and wheeled from the table.

A florid-faced major came into the open room, puffing from unwonted exertion. Strange hid the tension which took hold of him as the German stared at his face.

"*Ach du Lieber!*" the man exclaimed. "You look, *Herr Graf*, as though you had fought with a wildcat."

FOR the first time since he had encountered von Falke, Strange remembered that the spy bore the title of count. The major's deferential manner showed him that von Falke was a man of influence at the base. He took instant advantage of that fact.

"I've no time to waste talking," he snapped. He turned to the path as three armed Heinies hurried down to the hut. "The general wants some one here—you'd better leave one of your men until an officer comes."

The major detailed a man, followed as Strange led the way up the path. The two enlisted men brought up the rear. Strange climbed as fast as he could, so that the major did not recover his breath until they were in the car. The machine crawled over a narrow, rocky trail under a stretch of camouflage nets.

"The general has been in a terrible state," said the major. "The High Command has been burning the wires—afraid that the secret was out."

"It's safe, thanks to me," rapped Strange. "But those fools at the abbey almost wrecked everything. I don't understand yet how they let it happen."

"Rohrbach told us a few details," the major replied. "The Frenchman was posing as one of our minor agents, with information to be sent across. He slipped away and hid in one of those old suits of armor, but they checked up and found he had not left. When he found he was trapped he ran up to the old ramparts, barring the door. It took them several minutes to break it down.

"When they broke through, he was trying to place a stone block on that old ballista, which he had partly set. There was a message tied to the block. The stone fell back and hit the release just as Rohrbach's men were about to seize him. The Frenchman was hurled over the rampart before he could jump out of the way."

Strange hid a shudder at the thought of the horrible death which had come to Jean Fourrier.

"And a fine time I had, covering it up," he growled.

The road flattened out, swung under a wider expanse of nettings. Blue-shaded lanterns bobbed under the camouflage, and by the vague light Strange saw a few planes. It was impossible to be certain, but he thought there were tents farther down the line. The car turned in the other direction, passed several dark one-story shacks, halted before a building larger than the others. Sentries came out of the shadows, admitted them after a brusque word from the major.

Strange had one hand in his pocket, resting on the Luger, as they went into a dimly-lit vestibule. A stolid *Unteroffizier* saluted, opened the vestibule door. Strange braced himself as he saw the bright light in the room they were entering. This was the test he had dreaded. Would his make-up pass, or would he be denounced at once as an impostor?

There were five or six men in the room. One, a beefy German in the uniform of a major general, was shaking

his fist at some one his bulky form hid from view. He jerked around as the door opened. Strange's heart sank. The man the general had been threatening was Noisy Jay!

CHAPTER VII

CRASH OF THE CRATER

EVEN in that first instant of dismay, Strange kept his face set in grim lines. A look of murderous rage came into Noisy's eyes as he saw Strange's made-up features.

"You damned butcher!" he screamed. "I'll get you if it's the last thing I ever do!"

Two hulking guards jammed him back against the wall. The beefy Staff officer strode toward Strange, his heavy jowls hung down like a rooster's wattles, and a huge double chin made his face seem monstrous. Strange knew from G-2 photographs that this was General Bruck, a member of the German Supreme Command. Bruck stared at his apparently battered features.

"Was it the crash or that *verfluchte* Yankee who played that devil's tattoo on your face?" he demanded gutturally.

"Both, *Herr* General," Strange replied sourly. He glowered at Noisy. "So you captured the pig."

"He landed here," Bruck grunted. "He thought it was a vacant clearing—but he found otherwise." An ugly grin crossed his greasy face. "We just told him that you killed the other one—it seems the swine were brothers."

Strange laughed. It was the cruelest thing any role had ever forced him to do. But—von Falke would have laughed. "Come," barked the Boche general. "We can deal with this fool later."

Strange was glad to escape from the room, from that white and tortured face. He followed Bruck into a larger room where several men were grouped about a telephone switchboard. Two men with pads sat at a table on which stood an amplifier and a microphone. Strange knew that these were connected with the hut. The harsh voice of Rohrbach, the false monk, was pouring from the amplifier as they entered.

"—and the 318th Observation Squadron will operate from area D.817, G.436, in the Bois d'Auberville. This is the last Air Service order we heard."

An alert German officer stepped to a wall map of the Western Front, made an erasure, added a neat inscription at another spot. Strange felt his blood turn to ice as his eyes raced over the map. There before him was an exact picture of almost every key location in the coming American drive. The position of hidden artillery, the new ammunition dumps, troop billets and even the general operation attack plan—all was indicated there.

Two thirds of those moves had already been made. Some were being changed at the last minute, he knew, because of G.H.Q.'s knowledge of the information leak. And the Germans were receiving those changes! Not only that, German guns had been moved to cover the most important points, and

from the line-up of Boche *staffels* and ground forces, Strange saw that the Yanks would be plunging into a deadly trap if they were not warned. Even now, a German Air Force major was moving a *staffel* tab on the map, and phoning to some distant headquarters to effect the transfer.

A lean colonel with a cold, gimlet eye came out of an office on the left. He hurried across the room to Bruck.

"Spa is calling again, sir. They demand a full report."

"Come along," Bruck growled at Strange. "Colonel Vorst, check up and see why those Hanovers haven't arrived." He went into the office, motioned for Strange to close the door. "Now, before I call the High Command, are you positive the Allies don't suspect how much information we have?"

"Absolutely," said Strange. "They know there's been a leak—but nothing like the truth."

"And St. Evaux—you're sure they don't suspect the abbey?"

"Not in the slightest." Strange hid his feverish desire to have the questioning finished. "Dropping those other men in armor has fooled them completely."

"*Gut!*" said Bruck. He reached for his phone, paused. "What about the man Little? We had reports he was killed."

"He's dead," said Strange. "I killed him before he had time to talk. But that was a mistake, *Herr* General—setting so many after him. It caused a great deal of trouble."

"But, he might have told someone about being bribed by the old monk at the hut." Bruck swung around as the phone buzzer rasped. "*Ja*, I am ready for Spa. Von Falke, you had better wait outside."

"I'll go have this cut treated," said Strange. He went out, face grim under its disguise. So that was why Private Little had been murdered. On one of his lonely walks about the valley, he had found the path to the hut, had probably stumbled on a monk experimenting with the echo trick. And the Germans, also learning of that trick, and seeing its possibilities, had determined to silence him.

"—a machine-gun company has just arrived on the field," the harsh voice of Rohrbach was reporting through the amplifier.

Strange pushed through the taut group in the communication room. He took a side glance at the master map, went into the ante-room.

"Where is the prisoner?" he grated at the non-com in the vestibule doorway.

"In this room, to the right, *mein Herr*," said the Boche, saluting. Strange stalked into the room, closed the door. Noisy stood with his hands tied behind him, a fresh bruise on his face, and two guilty-looking guards in front of him. The murderous glare came back into his eyes as he saw Strange.

"I'll question the prisoner alone," Strange snapped.

"But, *Herr Offizier*," protested one of the men, "he is dangerous—he will try to kill you."

Strange gave an ugly smile, produced

the Luger.

"Two can play at that. I would like an excuse to even a certain score with him."

The men were starting out when the drone of a gliding ship became audible. Strange stopped one of the Germans.

"Wait," he rapped, "that must be one of the Hanovers. General Bruck has ordered a special mission for the first ship. Tell the pilot not to shut off his engine." He motioned to the other man. "Tell the senior non-com the general wants bombs in the Hanover's racks as quickly as possible. Bring me word as soon as the ship is ready."

He closed the door, keeping Noisy covered.

"Now, *schwein*," he snarled in a voice which he knew would reach the non-com out in the vestibule. "I'll give you one chance to talk."

Noisy tugged furiously at his bonds.

"You damned Hun!" he cried in a choked voice.

"Get back!" rasped Strange. Then he spoke in a swift undertone. "Don't let on, Noisy—don't make any sound—"

He lifted the bandage for a second, let the hard set of his mouth change. A stupefied look came into Noisy's face.

"Phil!" he whispered dazedly. "Then Tom—"

"The last I saw, you two were fighting each other," Strange told him in a low voice.

"I thought he was von Falke," groaned Noisy. "I put a burst into his prop and he stalled down into the woods near here. Then I saw von Falke's ship under that flare—I saw what I'd done—I landed to try to help Tom. The Germans jumped me from under those nets before I could take off."

"They accepted my story that I killed Tom," muttered Strange. "They'd found the ship, obviously—that means Tom got away."

"Then he wasn't hurt!" exclaimed Noisy.

"No, and he'll probably hide out and sneak across the lines. But we're in a tight spot. We've got to warn Choumont, without letting the German High Command know about it."

Footsteps sounded in the ante-room. Strange raised his voice in a torrent of angry abuse. The steps died away, and a door slammed. In a lowered tone he explained hastily the main points of what he had learned.

"Then all that information comes from the abbey?" Noisy said in amazement.

"By way of that open church," Strange said hurriedly. "The domed roof acts like a huge megaphone, and the sound waves are amplified to carry around the crater walls at that height. Also, words from the echo center on this side are focussed there and made louder."

"But where are they getting those secret reports?" demanded Noisy.

STRANGE had laid down his gun, was loosening the ropes at Noisy's wrists. "I think there's a cable at the bottom of the Moine River—probably

laid at night by Boche agents. Our 6th Corps H.Q. is in an old inn at Belcourt, right along the river—and it wasn't a headquarters until the old French town-hall was burned recently. The Germans must have planted dictaphones in the walls and tapped the phone wires by induction, before they forced that move by burning the hall. It explains the whole thing—they could listen in on Staff conferences—hear direct G.H.Q. wire reports—everything."

"Judas Priest!" Noisy said. "So that's why those murders were committed. They were afraid somebody at the 55th would learn about that whispering gallery."

"Right," Strange said grimly. "And they chose a good man to engineer the murders. That devil even poisoned a German pilot to make sure he couldn't talk and let out the secret."

"But what are we going to do?" Noisy asked hastily.

Strange listened briefly to the rumble of a motor out under the nettings. "Those bombs should be almost ready. There's one other move we'll have to risk." He spoke hurriedly for a minute.

"Good Lord!" Noisy groaned. "There's not a chance in a thousand."

"There's got to be!" grated Strange. "Remember, they think I'm von Falke. If we move fast, they'll be too surprised to stop us."

He shoved his other gun into Noisy's flying-coat pocket, leaving the youngster's wrists loosely tied behind his back so that he could slip his hands through. Opening the door, he roughly pushed Noisy outside, prodded him toward the communications room. The *Unteroffizier* on guard at the vestibule stared but made no attempt to stop them.

Strange flicked a hasty glance around the larger room. Two of the Germans looked up from their tasks, startled at sight of the prisoner. But the gun Strange held and Noisy's tied hands reassured them. General Bruck stood with his back turned, eyeing the key map on the wall. The sharp sputter of a motorcycle sounded from outside, and the general wheeled.

"Hasn't that man gone to Post Two yet?" he barked at one of the Germans.

"Yes, *Herr General*," the officer began, then stopped as Bruck swore at sight of Strange and Noisy.

"*Donnervetter!*" the beefy general erupted. "Why are you bringing that pig in here?"

"I've learned a way we can use him, *Herr General*," Strange answered quickly. They were not quite close enough . . . The odds were still too high, even though most of the Germans did not seem to be armed. "If you will let me explain in private—"

There was a faint sound as the ante-room door opened. Bruck's eyes twitched past Strange, then a look of absolute amazement came into his heavy face. A terrible foreboding swept over Strange. He started to whirl—went rigid as a gun was shoved into his side.

"Stand still, *schweinkopf!*" ordered

a furious voice.

"*Von Falke!*" cried Bruck. "*Um Gottes Willen*, then who is this?"

"The devil himself," came von Falke's snarling answer. He jerked the Luger from Strange's hand, drove him back beside Noisy. "Keep them covered," he rasped at the entry guard, who had followed him inside.

The rest of the Germans had leaped to their feet in astonishment.

"A spy!" gasped a portly officer.

"More than that," returned von Falke savagely. He snatched the helmet and bandage from Strange's head, pointed to the point where the make-up ended. "This smart *teufel* is Captain Strange."

"But you said you'd killed him," burst out the general.

"He was the one who phoned you from Post Two," said von Falke harshly. He told Bruck what had happened. "When I fell from the path I struck on a ledge and was knocked unconscious. I managed to crawl up the slope a few minutes ago. This officer replacing Hildt brought me here."

A *Leutnant* with an automatic had followed him into the room, was grimly watching Strange and Noisy. Out in the anteroom, a curious group stared in at the scene.

"*Bei Gott!*" Bruck said hoarsely. "Perhaps he gave some message to their Air Service general. We just heard he had gone to Belcourt to meet their Intelligence chief, who is being flown there by a G-2 pilot."

"He couldn't have known anything to tell General Thorne," said von Falke with a contemptuous look at Strange. "He didn't see anything at the abbey until he had taken off."

A MAN in pilot's garb pushed through the crowd in the ante-room, saluted General Bruck. "The bombs are in the racks, sir. I'm waiting for your orders."

"What?" barked Bruck. "I sent no word about—" he broke off, glowered at Strange. "It must have been this *spion*—a trick to escape."

Strange barely heard him, for in that instant his eyes had fallen on a grimy-faced figure in mechanic's dungarees, out in the ante-room. With a almost electric shock, he caught the man's surreptitious signal. The oil-smearing face under that dirty, shapeless hat was the face of Tom Jay!

He could easily guess what had happened. Tom had sneaked onto the darkened base, overcome some hapless German mechanic. Learning that Noisy was a prisoner, he had risked discovery and death as a spy in the hope of freeing his twin. Strange stole a side glance at Noisy to see if he had recognized Tom. Noisy was gazing ahead, stoically.

"Post One! Post One!" the speaker horn on the table suddenly blared out. "Colonel Jordan and General Thorne are in the conference room at Belcourt—I am afraid they have guessed something."

"Tell Rohrbach to connect his amplifier with the conference room circuit and let us hear what they say!" Bruck

flung at a German near the microphone.

The officer hastily repeated the order. There was a pause, a clicking from the speaker horn, and Strange knew that in the distant abbey church an amplifier horn was being tilted toward the crater walls. In a second, echoed words sounded from the speaker on the table. He stiffened as he heard Thorne's voice:

"But I tell you, Jordan, the leak's got to be here at 6th Corps. Before he disappeared, Strange proved that a hidden squadron close to St. Evaux was tipped off almost instantly after my conversation with you."

Strange heard the G-2 chief swear vehemently as Thorne finished the full explanation.

"There's only one answer. The 6th Corps phones must be tapped. Not crudely, either . . . H-m-m, it would have to be done before—By God, that's it! The old headquarters was burned purposely to get 6th Corps moved into this place, after Boche spies had fixed it up."

Bruck spun around, his greasy face livid.

"The secret's lost!" he snarled at von Falke. "They'll have the rest of it inside of an hour."

"We can rush Gothas there—blow the place off the map," the spy said fiercely.

"Too late—I'm going to warn the High Command. We can attack at dawn on all the places we've registered, before they have time to shift their forces."

Strange's muscles were aching with the tension of the past few minutes. There must come a break . . . but the *Leutnant* and the non-com were still watching him and Noisy, in spite of the excited group beyond them. Strange's hands were at his side, almost touching Noisy's flying-coat. The gun in Noisy's pocket was within inches of his hand . . .

"—might be right, but how could tapped wires alone explain it?" Thorne's voice was booming from the horn on the table. "You aren't crazy enough to think the Boche has run a telephone system right across our lines into Germany?"

"No," came Jordan's snapped reply. There was a brief pause, and Strange flicked a veiled glance toward the doorway. With dismay, he saw that Tom Jay had disappeared. He had counted on him to handle that group . . .

"I've got it!" Jordan's voice barked. "There must be secret wires running from here to some kind of signalling station hidden in the Vosges. Come on, we'll break out every man on the post. I'll find those wires and trace them if I have to tear down the damned building."

"*Mein lieber Gott!*" howled Bruck. He leaped toward the switchboard. "Direct wire—the Field Marshal! Plug in all main headquarters."

Half a dozen Germans sprang to make the connections. Von Falke had turned toward Strange, a light of vindictive hatred in his dark eyes. But he had not taken two steps when Bruck whirled from the switchboard, sprang

toward the two prisoners. His bull-like rush threw von Falke aside.

"Give me your gun!" the general rasped at the startled *Leutnant*. "I'll finish that green-eyed pig—"

HE snatched the weapon, and in the same moment the non-com hurriedly moved out of the way. It was the instant for which Strange had tautly waited. His right hand was flashing down into Noisy's pocket as Bruck spun around with the *Leutnant's* gun. He leaped back, fired swiftly.

A sick, horrified look filled Bruck's eyes. His hulking body doubled suddenly at the waist. Noisy Jay jumped forward, hands freed of their bonds, as the general started to fall. He tore the gun from Bruck's nerveless grasp. The non-com was frantically swinging his pistol toward Strange. Noisy fired, and the man went down with a groaning cry.

Von Falke had leaped back as the guns began to roar. Springing back of the switchboard, he wildly pumped a shot across the room. The bullet clipped the wall between Strange and Noisy. Strange drilled a shot at the edge of the switchboard. The slug ricocheted with a scream.

Before von Falke could fire again, glass crashed from a window near the switchboard. An arm with a pistol was hastily thrust into view.

"Drop it, you rat!" came Tom Jay's voice.

"Good work!" rapped Strange. "Keep them covered—Noisy, watch that door!"

A gun flamed from the direction of the ante-room. Tom sent a shot through the doorway, and the group outside broke madly. Strange whirled, tore the key-map from the wall with a sweeping movement. Above the rumble of an idling Mercedes, shouts rose outside.

"Follow our plan, Noisy!" Strange flung at the youngster. He jumped across Bruck's crumpled form, swerving his gun over the group of cowed and frightened Germans. "Down on the floor, all of you!"

One man tried to break for the door to Bruck's office. Tom's pistol roared, and the Boche tumbled with a bullet in his leg.

"Get to that ship, Tom!" Strange shouted. "They'll gang you any minute."

"Not till you two are clear," Tom yelled back.

From the open vestibule door, a gun cracked viciously. Strange leaped behind the switchboard, jammed his gun into his pocket. With flying hands he tore the wires from their connection points. It was done in five seconds, but a cry of alarm from Noisy told him they were almost trapped. He dashed toward the door of Bruck's office, shouting at Tom over his shoulder.

Noisy blasted a shot toward the ante-room, raced into the office as Strange flung open the door. He sprang to the window while Strange hastily switched off the lights.

"This way," he said hoarsely, as Strange swung through after him. "The mob's at the front—but they'll be

around here any second."

Strange hurriedly folded the map and shoved it inside his coat. A terrific uproar arose behind them as they ran toward the ships under the nettings. The sky was beginning to gray, and by the faint light Strange saw a running figure. Noisy saw it at the same moment.

"There's Tom!" he gasped. "Thank God he got away!"

"The whole pack will be on us in ten seconds," Strange flung back grimly. He shot a look down the line. "Was your Spad crippled?"

"No, but you'll never have time to—"

"Never mind that! You two grab that Hanover—do what I told you—"

The last word was lost in the thunder of the idling engine. Two greaseballs jumped toward Tom as he neared the two-seater. They fearfully raised their hands as they saw his gun. Strange leaped at the nearest man.

"Swing the prop on that Spad! If she doesn't start, you're a dead man!"

Light streamed from the vestibule of the office shack. A score of men rushed out, and the light shone on pistols and rifles. Strange vaulted into the pit of the Spad, threw the switch. The panic-stricken mechanic jerked the prop, but the half-cold engine only coughed.

"Swing it!" Strange rasped. He jumped erect in the pit. The German had dived under the wing, had fled into the shadows. A rifle bullet whined through the Spad's wing as he sprang down. He ran to the nose, seized the blade. Bullets crackled around his head. Then suddenly a machine-gun erupted with a furious chatter. Screams of dying and wounded men came, muffled above the rumble of the idling Mercedes. One of the Jays had cut loose with the rear-mount guns in the Hanover.

THE Hispano caught on the second throw. Strange jumped aside as the unblocked ship began to roll. He was in the pit in two seconds, crouched over the stick. The Hanover's engine blasted, and both ships began to roll from under the nettings. A dozen men dashed after the ships, firing wildly. Strange saw von Falke leap toward a black D-7, one of the four which had escaped from the battle over St. Evaux. A mechanic ran to start the engine for him.

Off to one side, Maxims blazed fiercely as the German ground gunners went into belated action. The Hanover dipped, pulled up and chandelled steeply over the nets. Strange raced the Spad the full length of the narrow runway, back-sticked as the motor revved up to its full speed. Steel-jacketed slugs gouged through the wings as he whipped back over the base.

Von Falke was taxiing madly down the field, and behind him men were shoving out another of the black Fokkers. Strange tripped the Vickers, raked the group of mechanics. Two or three fell, and the rest fled back out of sight. He banked again, saw with a start that von Falke was already in the air. The spy was flying with the desperate skill of a madman. Strange pitched around at him, as the black Fokker charged after the circling two-seater. The Jays

were almost over the base

WHOOM! The first bomb struck. Flame spouted up, and tangled bits of wreckage flew through a vast hole in the nets. Von Falke banked away wildly. With another roar, the second bomb struck, this one squarely on the office shack. With merciless precision, the hurtling projectiles blasted into the ground, bringing ruin and death. In a moment more, not a plane, a car or a cycle remained to the survivors below.

With a hasty signal to the Jays, Strange whirled into the West. Like a black Fury, the Fokker screamed after him. He crouched, throttle wide open, slitted eyes staring over the cowl. No time to turn and fight a minute lost might mean the death of thousands

Tracers shot past his wings. Von Falke was firing desperately at long range. Strange did not swerve. A race against time With the key-map in their hands, Thorne and Jordan could turn the German scheme into a bloody boomerang. He could sense von Falke's furious purpose as though the man were shouting in his ears.

Kill the Brain-Devil! Send him down in flames—and the map with him! Warn the High Command to strike at once!

The Spad thundered over the ridge and across the valley of St. Evaux. The Moine lay silver in the half-dawn Twelve miles more to Belcourt

T-t-t-t-t! The Spandau clatter was louder now. Strange whirled in his seat. The black Fokker was closing in. In seconds more those red-winking guns would have him in their range

Like a thunderbolt, the Spad dived toward the northern pass. Then with both hands hard on the stick, Strange hurled it up into the gray. Guns flaming, von Falke tracked through. Up, up shot the Spad losing speed, slugs clutching at its wings

In that last second, von Falke seemed to guess what was coming. Strange saw him begin to kick off. He shoved the stick clear forward.

One instant, the ship hung there. Then with a terrific howl, the Spad whipped its nose toward the earth. The Vickers drummed at his touch.

Caught squarely in his sights, the

Fokker trembled and burst into flame. He had a flashing glimpse of von Falke's horrified face, before the fire swept over him. The Fokker moaned down and crashed on the sides of the crater. An avalanche of loosened rock followed as it fell.

A searchlight from the drome swept through the lightening sky, followed the tumbling plane. The edge of the beam fell on furtive, black-robed figures stealing down the abbey road. They scattered hastily. Another light swept over them, followed them as they ran. Strange slowly nodded. The pseudo monks would not get far.

The Hanover was gliding down out of the East. He pulled up beside it, waved to the Jays. Side by side, the two ships roared off toward Belcourt. Strange looked back. Close to the old abbey, the crater walls were broken, where a great mass of rock had crumbled and hidden all trace of the spy.

A grim smile came to Strange's lips. The whispering gallery of St. Evaux was no more. Perhaps the last sound to echo from those cold, dark walls had been the death-cry of Count von Falke.

All Questions Answered

(Continued from page 32)

rops go. The last one went out over the Pacific and never came back. The Fokker was a better ship than the Spad in many respects.

Andres de la Garza, Brownsville:—The Avia motor I use in my Griffon stories is an actual power plant, but the plane is imaginative. Fonck had seventy-five victories. Putnam had eleven. The other person you mention is credited with fourteen.

Jack Doyle, Albany, N. Y.:—I would suggest that you write to Parsons in care of any magazine you may have happened to see one of his stories in. The editor will be glad to forward it to him. I do not know where he is.

Ernest Arnold, Newark, N. J.:—The wheels on large planes, as used as controls, are turned to the left or right, whereas the stick method required the movement of the stick itself over to the left or right, for banking.

Alfred Schaefer, Tamaqua, Pa.:—The picture you sent me is that of two German Arado ships which we told you about some months ago. We have no

official figures on its speed, but we believe it does 172. B.M.W. engines of 630 h.p. are used.

Joseph Walsh, New Bedford:—The figure you inquire about is fourteen official. Thanks for your good work with Mr. and Mrs. Baylies.

George E. Murphy, Augusta:—Thanks a lot for the information on the Turkish ace, Ryck Boddike. I am sending you the book lists you desire.

Donald Heyman, Clinton, Iowa:—Details, parts, etc., for the Flying Flea may be obtained from E. G. Perman & Co., 24 Brownlow Mews, Guilford Street, London, W.C.1, England.

H. L. Richards, Williamstown, Mass.:—Write to the International Aircraft Corporation of Niles, Mich., manufacturers of the Heath planes, for details of their knock-down planes which I believe once included a low-wing light monoplane.

Warren Stucker, Edgerton, Wis.:—Franke Luke, noted as a balloon-buster, came from Phoenix, Arizona. I do not

know his original address, but I presume that a letter directed to his parents c/o the Postmaster of that city, would reach them eventually. We have run dozens of stories about Frank Luke in this magazine.

Russell Griffith, Ashville, N. C.:—Yes, we know the Lockheed Electra has two rudders now, but it originally came out months ago with a single rudder. We hope this answers this argument for once and for all. See my article on von Richthofen in the December issue for more on the Baron's triplane, etc. The Spad had no dihedral. Waco uses any type prop you wish.

Arthur McCarthy, Revere, Mass.:—Guynemer is dead. He had 53 victories. A standard airplane can cost anything from about \$2,000 to \$60,000. Goggles and a helmet can be purchased for as low as \$2.00.

Gail Phares, Challenge, Calif.:—The ship you refer to is the Waco Model D, a two-seater biplane with a 420 Wright Whirlwind; top speed, 195; cruises at 166.

BY ARCH WHITEHOUSE.

From the Model Builder's Workbench

(Continued from page 56)

can put a detachable wing guard on your ship. Merely put a small "eye" bolt (made from a common pin with head cut off) into the leading edge at each wing tip, and another "eye" bolt in the nose block. Between these, stretch a length of 1/16" sq. rubber

thread, attaching with a little pin hook at each end of the thread. Stretch tightly. Now fly the plane. If an object is struck, the tension of the rubber thread will take up the shock and swing the ship around the object. This guard can, of course, be removed during model ex-

hibitions of your model craft.

—GEORGE DAY.

SOLVING THE BAMBOO PROBLEM
SHAPING bamboo tails, rudders, and wing tips is a tough job for novices—and often for veteran model builders,

too. Your bamboo members must be shaped well if you wish to get the most out of your flying model. Here's a method which will be found of great aid:

Obtain about a dozen long, straight pins and a few small candles (birthday candles, if possible). Now suppose we make a rudder. First stick the pins along either edge of the rudder on the plans. Next, insert the strip of bamboo in the slot made by the pins. Be sure the bamboo exactly conforms to the shape of the rudder member.

Now raise the bamboo about half an inch above the plans. If long pins are used, the bamboo may be raised more. Next, light one of your candles and play the flame along the top and bottom of the bamboo, especially applying the heat to the points where the curves are sharpest.

After heating, you can remove the pins from the plan, and your rudder member will be found made to shape and ready to be attached to the fuselage. For tail and wing tips, employ the same method.

—S. L. ROSS, JR.

FOR SOLID MODEL FANS

WHEN making a solid scale model, you may often find yourself without bamboo or reed available for struts, bracing, etc. Ordinary toothpicks will solve this problem. They are excellent for center struts and inter-plane struts, especially when given a coating of ordinary glue for reinforcement, after they are in position. Simply cut the

Attention, Model Builders!

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

toothpick to the correct size, putting it through the upper wing, into the top of the fuselage. Sand the protruding tip. The same can be done in making interplane struts. After this is done, put a drop of cement at the point where the tooth pick penetrates the wood. This makes a strong base for the strut.

Common pins make the best exhaust pipes for solid models. Bend them where necessary, press them to the side of the fuselage, and apply cement to hold the pin in place. After the cement is dried, the stick can then be painted black. Machine guns can be made from matchsticks by sanding the sticks to the desired form and painting them black.

To make a solid model look well even if you have no enamel paints, try this method. Sandpaper the model completely and apply the first coat of whatever paint you have. Sand again with the same paper, and apply a second coat of paint. Spread on a coat of ordinary five and ten cent store glue. Sandpaper the model again and apply a second coat of glue. This will result in a shiny finish at a very small cost to the model builder.

—FRED A. DRAGONE, JR.

BEESWAX FOR WING FILLETS

A LOT of trouble is often experienced in making wing fillets and other fill-in streamlining effects commonly added prior to doping and painting. Many modelers use sawdust mixed with glue for their fillets, but this method frequently leaves a rough finish.

Those who are acquainted with the manufacturing of aircraft, however, know that beeswax is used on the lock-stitching cord of the wing to keep the cord from unraveling. This is because beeswax is the only wax to which dope will adhere. Because of this property, you can use this commercial wax on your solid models.

By getting this wax into a soft state, you can make excellent fillets with it. Moreover, you can rub this wax lightly over the parts of your plane to fill in any small cracks which might detract from the appearance of your model when finished.

—HOWARD J. MULLER.

Death Flies the Electra!

(Continued from page 22)

Methods in Exterior Ballistics before the Canadian Police Chiefs' Association. Here's a clipping from yesterday's *Montreal Mail*."

Lang took the clipping, studied it. "It got back here pretty quick, didn't it, Keen? The *Mail* was not on the streets until late yesterday afternoon. Did you fly down?"

"Fly? . . . Me?" laughed Keen. "No. We drove down—that is, Barney, my chauffeur, did. I slept most of the way."

"Car looks pretty clean for such a trip, Keen."

"That's like Barney—he never rests while there's a speck of dust on that body."

"Never mind the jabber, Lang," John Scott growled. "Come on inside, Keen. We've got a beauty for you."

They were ushered into the main office of the Amalgamated Lines via a gauntlet of tired-eyed newspaper men. "There's nothing new yet, boys," Scott bawled, shoving Keen inside.

Three men in business suits sat at a long table. Nearby, on a leather lounge, lay a girl, partially covered with a camel-hair blanket.

"This is Jay Bland, Keen," introduced John Scott. "He's top man here at Amalgamated. This is Mr. Slade, night dispatcher, and Mr. Netcong, the vice-president. They'll tell you what

they know about this. We want your advice."

"Thanks," smiled Keen, nodding to each in turn. Then he turned toward the girl on the lounge. "Is this the hostess?"

"Oh, yes. Now, Miss Clintock, will you join us again, please. This is Miss Audrey Clintock, the hostess who went through this amazing experience. We've kept her here for safety—away from the news hawks, you know. She's coming along okay. We're going to send her down south for a rest as soon as we can get her aboard a plane."

Smiling wearily, the girl sat down at the table. Someone put a steaming cup of coffee before her and she seemed grateful. "Thank you, ever so much," she said. "I feel much better now. I must have slept some."

"Fine. Now tell Mr. Keen what happened, in your own way, Miss Clintock," Scott urged.

"WELL," the girl began, "I was hostess on Trip 9. We were well on our way to Buffalo—somewhere over Scranton, I think—when one of the passengers, a Mr. Anton Valentier, got up from his seat and went to the lavatory. I was well down the cabin, near the freight compartment door. Most of the passengers were dozing. The next thing I knew, Mr. Valentier came out of the

lavatory and rammed a gun against my ribs. Then he made me open the freight compartment door. I had a key for it as I keep the head-rest covers and boxed meals there.

"He made me go inside with him where he sorted over the registered express—then I noticed he had a parachute on. I ran out while he was sorting the packages to warn the pilots."

"Damned plucky," commented Keen.

"I yelled at Hank Morrison, the first pilot, that a man had gone mad inside—with a gun. He yelled at Eddie to lower the wheels. Guess he figured on getting down at the emergency field outside Scranton. Hank started to report back to Newark here, then Mr. Valentier came charging down the aisle. He pushed me from the control cabin—then I heard the gun go off once. He then shoved in the automatic pilot. The next thing I knew, the gun went off again and he rushed back down the cabin to the freight compartment."

"And he escaped through the emergency hatch with a package selected from the registered express," added Keen. "I read that in the papers."

"Did you read how Miss Clintock saw two planes outside after she had found both pilots dead, and that a man in black with his face completely covered with a mask appeared on the wing outside and ordered Miss Clintock to

let him in?"

"That was in the story, too," nodded Keen. "Amazing! And he—this man—brought the ship in and disappeared?"

"Only after he had identified himself as 'the Griffon,' Mr. Keen," snarled Drury Lang.

"What—the Griffon again, Lang? This is interesting! What did—what sort of a chap was he, Miss Clintock?" asked Keen.

"Well," smiled the girl, "he really acted like a gentleman. Nothing like the killer he's supposed to be. He told me that all he wanted was a chance to get clear once he put her down at Newark. He darted out the moment she stopped rolling."

"And completely disappeared?"

"Well, he climbed into a black plane of some sort, that landed alongside of us, and was away before anyone from the hangars could get to us."

"How interesting! You certainly had a hair-raising experience. But look here," Keen turned to Jay Bland. "What was taken from that freight compartment?"

The head of the Amalgamated looked questioningly at Scott.

"Go ahead, tell him," Scott ordered.

"Well," the president of the Amalgamated said in a dry voice, "it was the working model and blue prints of the Hammond prop."

Kerry Keen let out a low whistle.

"You know the Hammond prop?" asked Scott, somewhat startled.

"Oh, he knows *nothing* about aviation. He wouldn't fly for anything—not much!" smirked Lang.

"I know something about it," smiled Keen. "You see, Horton Hammond consulted me on one or two points with reference to the shedding of eddies from the blades of rotating propellers. It's supposed to be the first real silent prop made, isn't it? Something of a move toward the silent plane?"

"That's it, Mr. Keen," Jay Bland replied. "The greatest invention in aviation since the first Wright effort! Muffle the engine, and you have the most deadly air weapon known—the silent plane."

"And now," added Keen, "the idea has been stolen—by a gentleman with a French name."

The telephone bell rang at this instant. John Scott took up the receiver, barked into the mouthpiece.

"Yes, this is Scott What was that? . . . Hammond? . . . Horton Hammond found murdered at his home . . . this morning? . . . The devil!"

For a moment, not a sound was heard in the big office. Scott hung up the receiver, his face ashen and drawn.

"Get that?" he finally muttered. "They got Horton Hammond. There's no chance of saving that Hammond prop secret now. There was only one model and one blueprint!"

"Where was it going?" demanded Keen.

"To the Kragglund works in Buffalo, to be made up for secret tests," someone said.

"So you knew where Hammond lived, Keen?" smirked Lang.

"Only through the address on his stationery. As I said, he wrote to me and asked my advice."

"There was something queer about his death, Keen," John Scott added. You probably won't believe it, but Horton Hammond was killed by something belonging to you."

"To me?" gasped Keen.

"Remember the day I visited your library uptown? You showed me a number of strange historical missiles used in various forms of warfare. Do you remember that twisted steel dart you brought out?"

"The *flechette*?" Keen cried.

"Yes. It was driven down into his skull—almost down to his throat. Killed him instantly," Scott announced.

"I remember that. I had sent it to him to try out on the assumption that the curved vanes of that dart would help him to devise a prop blade free from eddies. The eddies create that tearing sound you notice when you stand off to one side of a whirling prop."

"Your yarns get better every day, Keen," snorted Lang.

Keen ignored him: "You are sure it was mine?" he said to Scott.

"It had your mark on it. The one you stamp on your collection of firearms and weapons—you know, the crown and dagger design with the 'K. K.' initials," Scott explained.

"Hammond," Scott continued, "was evidently walking from his shed—the one he uses for a workshop—to his home. They believe the *flechette* was dropped from a plane. One was heard over the shed late last night, and they believe he was killed about midnight. His place is at Port Jervis, you know."

"Um But how could anyone aim a *flechette* like that—with that accuracy? They used to be dropped in bunches out of planes on groups of marching troops."

"That's for you to figure out, Keen," Drury Lang butted in again. "It was your—your whatever you call it. Talk yourself out of that one."

"Why, I sent that thing to Hammond about a month ago. It could have been picked up by anyone and taken around the world in that time. But they couldn't have dropped it with that accuracy."

"Well, no matter, it's done now, and we face the job of recovering that propeller, and finding the man who killed those two pilots. Then we ought to be able to find out who killed Hammond. What do you say, Keen?" asked Scott.

"To hell with the prop! We want the guy who killed those pilots," broke in Jay Bland.

KERRY KEEN slouched back in his chair, fumbling with a gold-tipped cigarette. He frowned and stared at the girl who had wandered back to the lounge. He was certain, now, that he had seen that girl somewhere, but his thoughts returned to the job in hand.

"You know, John," he said quietly, "I wish I could figure out how they killed Horton Hammond. But I've got to be going. Good day."

"Oh," gulped Drury Lang.

"What are you going to do?" asked John Scott.

"I don't know for certain," said Keen. "I think I'll wander over to Bannerman's."

"Bannerman's? That place on lower Broadway where they sell old guns, muskets and that sort of junk?" asked Lang.

"Yes, there's a couple of old weapons I'd like to look up."

"But what about Hammond—and the prop?" urged Scott.

"What about it?" snapped Keen. "It's all too much for me. You're the Secret Service men."

And with that Keen started for the door. Lang followed him out like a bloodhound.

"What's the game, Keen?" demanded the sleuth under his breath as they passed the crowd of newspapermen.

"Nothing much—just my hobby of collecting rare weapons."

"You can stow that gag, Keen. We can pull you in for that Hammond affair you know. It was your thing-umabob that killed him, you know. And you'll have a tough time proving where you were last night. We can check your car at the border, you know. You *might* have been lecturing in Montreal, but you certainly didn't drive back all the way last night. And there is another little matter of \$10,000 donated to the Crippled Airmen's Fund—sent in under the signature of 'the Griffon.'"

Keen frowned.

"You see, Mister Keen," Lang taunted, "we checked that money. And it happens to be some of the money taken from that lad, Norton Gates, who swiped Webb Marvin's plans. That was a neat job, Keen, but you made the mistake of not going through the money closely. You left Gates' card inside the pack of bills!"

"So what? You still think I'm the Griffon, Lang?" smiled Keen. "Can you prove it?"

"Not yet, Keen. But go ahead. You'll make one big mistake, yet."

"But what will happen to you if the Griffon no longer aids you," Keen parried. "You've done pretty well for yourself out of it."

"Sure Sure, Keen. That part is Okay. But you're not walking out on us in this one, you know."

"A holdup, eh?"

"You can help, Keen. You know something—and we want information. You go to work on this thing, Keen, or—"

"Or what?"

"Well, there's a lot of news hawks in there, demanding to know who this guy the Griffon is. You're front page news today, Keen. The sky highwayman who saves beautiful hostesses and brings in transports after someone kills the pilots—Robin Hood stuff. But there's too much dough connected with you that simply don't jell. Suppose I tipped them off that you *might* be the mysterious Griffon. Know what that means? They'd run you down to earth in no time."

"But you don't want the Griffon run

to earth, Lang," grinned Keen, waving to his chauffeur.

"No—er, not yet, Keen. We want that Hammond prop thing back."

"Look here, Lang," Keen snapped with an icy voice. "You know damn well you're all wet on this business. You haven't a thing on me. I'll have a go at this thing, just to get the bird who killed those pilots. The prop thing may be okay and then again it might be a gag. Who knows? But if I work on it, you keep your paws out of it. You blunder about like a bull in a china shop. Is that a go?"

"Shake!" grinned Drury Lang. "When do we get something?"

"What time do you get into your office in the morning?"

"All depends."

"Well, stay in bed an hour longer tomorrow. I might be able to do something."

"You're making it tough for yourself, setting a date like that, Keen. If anything does turn up and the Griffon is mixed up in it, it certainly will look bad for you."

"And if I don't, you get nowhere—and Scott will wonder what happened to his ace detective, eh, Lang?"

"Buzz off!" growled Lang, turning back to go inside again.

The big black Dusenbergs backed up to the steps of the reception office and Drury Lang heard Keen say: "New York . . . downtown, 501 Broadway, Barney."

And Drury Lang returned to the office perfectly satisfied. The address was Bannerman's.

BANNERMAN'S is housed in a gaunt, age-stained building near Canal street. The windows are crammed with dusty muskets, faded uniforms, and rusty war equipment ranging from steel helmets to breastplates. Keen entered the narrow doorway and made his way immediately to the dingy office. The tall, sparse man at the desk recognized him at once. He shoved aside a tray of military buttons.

"Mr. Keen!" he greeted. "Glad to see you. What is it today? I have not been able to pick up that Turkish Flintlock pistol for you yet, but I know where it is. If we wait a few weeks, we can get it a lot cheaper."

"Never mind that now," Keen said quietly. "I want some information."

He leaned over, whispered something into the tall man's ear.

"Golly, that's queer," the man said. "I sold the only one I had about two weeks ago. Let's see," he frowned grabbing at a dusty ledger. "Here it is—yes, just about two weeks ago. To a young woman named Woodin. We sent it to a small hotel in Middletown. Ann Woodin was her name."

"Middletown—Middletown, New York?" gasped Keen. "Let's see, that's only a few miles from Port Jervis."

"About fifteen at the most. I know, because we have a summer place up at Delaware Water Gap, and we're in that section a lot."

"Got a picture of the thing?"

The man shuffled through a thick

catalog and held it open.

"There it is," he beamed. "What's up?"

"Never mind," Keen replied. "Don't tell anyone else about it. West African type," he mused, looking at the photo, "with hinged stock allowing the use of . . . Just the thing, Mr. Bannerman. Now keep this under your hat, in case a half-baked detective named Lang pops in. Tell him I came to see you about that Turkish flintlock, eh?"

"You know me, Mr. Keen."

Kerry Keen hurried out, leaped into his car again. "Home Barney," he grinned. "Graylands."

"What's up?" Barney inquired.

"Mr. Lang wants us to get the guy who killed those two pilots. Funny thing, too. He still thinks I'm the Griffon. Well, we'll find the gentleman for Mr. Lang. There might be some money in it."

"Not from Lang."

"No, the package, Barney—the package. That was Horton Hammond's new silent prop. Someone copped it and the government is all at sixes and sevens."

"They copped it last night about midnight," suggested Barney, "with that plane—it's a French Mureaux 170-C-1 which does about 235 top. They can be all the way to the Pacific coast by now, if they keep well up into Canada."

"They *could* be if they started off right away, but something tells me they didn't. You see, Barney, they waited to kill Horton Hammond sometime between midnight and about 7 o'clock this morning. So it is quite possible that they will lay low until darkness again—tonight."

"If they do, they're crazy!"

"Anyone who would try the stunt they pulled must have been crazy. You see, they *had* to go back and kill Hammond to make certain the secret of the prop would never get out. That must have blocked their plans considerably. That Mureaux probably hung about long enough to see the Electra heading back to Newark. Then they went down and picked up this guy, Valentier, to warn him and to plan the killing of Hammond. I'll bet my last nickel they are still in that area hiding out."

"So we are going out again tonight and try to find them?"

"You're getting smarter every day, Barney."

ALL the way back to Graylands, Kerry Keen sat and mused on the name of Ann Woodin. There was something hauntingly familiar about it, but somehow he could not place it. Keen was certain there was a woman somewhere, with the same name, who had been in the limelight. He'd look it up in his file when he got back to his Long Island place.

Barney ran the big car up the winding drive and Keen got out and let himself in. The Mick took the car around to the garage, changed his clothes, and went to work grooming the Black Bullet.

Inside, Keen poured himself a drink and changed also. He selected a rough tweed suit that was comfortable and

baggy. He looked the part of the country squire now. For some time he paced up and down his long library, tugging on a great pipe, his eyes half closed. Suddenly he went over and took down a large book: *The Blue Book of American Aviation* and ran his finger through the index.

He flipped the pages and came to a section devoted to women pilots. There he found the name: Woodin, Ann Barbara, T-2104. Alongside was a small photograph of Miss Woodin.

Keen whistled. The girl in the picture was Miss Audrey Clintock—the air hostess aboard the Electra. The same girl he had been talking to at the Amalgamated offices not two hours before.

"I'm beginning to get this a little better now," he mused. "Let's see if I have anything more on her in the file."

A close search brought to light an interesting bit of news about Miss Woodin. She had won her transport license and was all scheduled to take over a piloting job on a mid-west passenger air-line. But just at that time, another woman flyer who was already holding such a position lost her job—lost it because the passengers were not particularly keen about flying with a woman at the controls.

Seeing the writing on the wall, Miss Woodin's prospective employers then refused to hire her, feeling that their passengers would have the same idea. This sent Miss Woodin on the warpath and the whole affair got plenty of space in the newspapers. Women columnists all over the country ranted about it in their fight for equality. There was no question but that Miss Woodin was a skilful pilot, but as long as the passengers opposed the piloting of the other woman, the company felt there was little sense in giving such a position to Miss Woodin.

"But why did Miss Woodin change her name and go with another line as a hostess?" Keen asked himself. Of course, he could have taken the stand that flying was in her veins and that rather than take over some earthbound post she'd decided to become an air hostess.

"She probably thought that one of these days a situation would arise that would allow her to step in and take over the controls and bring an airliner in. The resulting publicity would assure her a reward, perhaps a co-pilot's berth," Keen mused.

Then he stopped with a jerk: "I'm beginning to get it now. She couldn't wait for an emergency, she had to make one. She was in on this thing all the time. She tied up with this bird, Valentier, and probably helped him get the package. She might even have slipped the parachute outfit aboard."

He drew down a large scale wall map and studied it. "Everything jibes now," he muttered. "Miss Woodin parks out at Middletown. Old Hammond had a place at Port Jervis. The Electra was stopped over Scranton. The three points are all within a sixty mile area!"

He pondered on the business of changing the name again: "She prob-

ably figured that they wouldn't give her the job if she used the Woodin name. She may have planned something like this all the while, and her instinct warned her that the Amalgamated officials would suspect something."

That point sounded reasonable to Keen, but he was now wondering what had happened to the Hammond prop plans and the working model. Who had killed old Hammond? He did not ask himself *how* Hammond had been killed—he knew the answer to that question. The visit to Bannerman's had cleared that up.

He was about to telephone to John Scott to warn him to have the girl hostess held, when his own phone rang. He turned toward it, then realized that he had the automatic answering and recording device clamped in. He watched the receiver arm slowly raise the French phone set and heard the reproduction of his own voice answer.

"Hello . . . This is Keen," the voice said over the speaker.

There was a mumbled response which Keen could not hear, as the message was being carried down into the recording plate below.

The responsive record he had devised was timed carefully with, "Yes . . . All right . . . Go Ahead" and "Thanks, that's all I want to know."

As a result, the person talking at the other end would be under the impression that he was actually talking to Keen—a busy man who spoke in monosyllables. Keen had timed it so that he was certain to get the gist of the message.

He watched the mechanism, a sly smile on his face. When it was completed he opened the lower doors and took out the wax record. He turned, slipped it on a small phonograph nearby, and ran it off. It said: "Mr. Kerry Keen? . . . This is Miss Clintock . . . at Newark . . . You're pretty smart, eh? Well, I recognized you. You're the Griffon! You made the mistake of mentioning the emergency hatch when you were questioning me this morning. That had *not* been mentioned in the newspapers."

Keen swore under his breath, but continued to listen.

"Well, Mr. Keen. You'll never get me. Listen to this: I'm leaving right away. They have an Electra out on the ramp ready for me. They *think* they're taking me down to Florida for a rest. They don't know who I am, though, and there won't be any Griffon to climb aboard this time and take over. You double-crossed me on that one. Make a move to stop me now, Mr. Keen," the voice went on, "and I'll drop Mr. Scott a line and let him know who the Griffon really is. But you won't be in the air now, will you, Mr. Keen? The Griffon only flies at night and there is still quite a bit of daylight left. I'll be over the border—"

And that was all Keen's responsive record allowed her to say.

FOR a minute, Keen was dumb-founded. He was trapped—or at least outwitted—by a woman. He

jabbed a push-button connected with Barney's quarters, then disengaged the recording device of his telephone set. He reached down for the receiver, then hesitated.

Suppose he called John Scott to have the girl halted? That would give his game away completely. Suppose he let the girl get into the air. It was dollars to doughnuts she would kill another pilot—perhaps two—and actually take over the Electra this time and slam off across one of the borders—but which border?

He figured fast. To get across any border but the Canadian was out of the question with an Electra from Newark. That settled one point, at least. It was reasonable to assume that the girl would try to get away with what she had failed to accomplish the night before.

"She'll head for somewhere to pick up Valentier. They have a reason for that. He's somewhere around Scranton or Port Jervis. He came back primarily to kill Hammond, but now it looks as though they have something else to worry about—something that requires an Electra. I wonder what it is."

He picked up the receiver and called Newark Airport. John Scott, who was still at the Amalgamated offices, answered. Keen tried to put on a calm air.

"Hello, John. Is Miss Clintock still around? This is Keen."

"Miss Clintock? No, they just sent her off for a rest. Down to Florida for a couple of weeks. What's up?"

"Oh, nothing. I just wanted to question her about that emergency hatch, you know. There's none shown in the drawings of that particular Electra model and I wondered about it."

"Bland says they were put in recently as a safety measure."

"That's all right, John. Tell Lang I'll see him sometime in the morning. You're sure Miss Clintock has gone?"

"Positive. We went out with her to get her past the newspaper men. She called her mother, just before she left, from a public booth. She'll be all right in a few days. A game kid, that, Keen."

"Game? . . . Sure . . . Damned game!" Keen replied. "Called her mother, eh? . . . Well, I'll be seeing you."

And with that, Keen hung up. He realized now that he could not have stopped her, had he tried. Scott and Lang would have been outside seeing her off.

"What's the idea?" demanded the voice of Barney at his elbow.

"We're taking off at once. Get her ready."

"What! In the daylight?"

"Have to. There's a job in the offing, Barney. Step on it."

"But—you'll give the whole show away. It's daylight—for a couple of hours yet."

"I'll take care of that, Barney. You put out the togs and get her ready."

"Oh, I remember now. The black light!"

Barney tore into a side room and came out with flying kits made of heavy black silk. They both slipped into them

and then buckled on parachutes. Keen drew on his face mask and goggles. Barney rolled his up under the helmet for a time.

"You get her warmed up, Pulski, while I go and set the lamp, upstairs."

"Okay, Ginsberg," grinned Barney. Keen darted upstairs to the big attic. There he came into a large room in which stood a battery of three search-light-looking arrangements. He focussed them one at a time and aimed them out of the tall window. He tugged a switch and the arcs hissed for a minute. Then he waited until the glow had taken on a strange bluish glare. The Tecla carbons sizzled and he adjusted the glare by peering through a square of reddish-yellow glass. Then he looked out of the window and across the lawn to the Sound. The effect was startling! It seemed as though a great splayed-out block of dusty glass had been placed there, obliterating all vision. He smiled, shut the great beams off, and snatched at a small wall phone.

"Barney? How's she coming?"

"Pulski to you, Ginsberg," the voice came up from below. "Are you forgetting your script?"

"Okay, Pulski," laughed Keen. "Run her out into the shelter of the arbor. I'll be right down."

Then Keen threw a time clock switch on the lights and set the hands. He checked it with his wrist-watch, then ran downstairs. Below, Barney had run the Black Bullet out from the hidden hangar. He had swung in the Skoda silencers so that the big Avia motor just purred as it huddled in the cover of the heavy arbor.

Keen came out of a side door and darted under the shelter of the heavy foliage of the garden. He barked under his breath at Barney: "Get moving. We've only got three minutes of the light."

They climbed in and Keen ran the black amphibian down the trim lawn to the hard sand of the private beach. There, to all intents and purposes, the Black Bullet disappeared. The black light directed down from the tall attic window had laid a swath of invisibility from which Keen could take off. He felt his pontoons take the water and the effect of swaying flotation as they moved away. The engine purred gently and then he opened her wide. They were taking off through the black light beam which shrouded their movement entirely. Only the banshee wail of the prop gave even a hint as to what was happening. Before the three minutes were up, the Black Bullet had climbed into the clear and was racing pell mell for the junction of three states.

AS they curled out high above Graylands, they could see that the strange light had disappeared. The time switch had snapped it off, leaving old salts with something to ponder over and a new atmospheric freak for the yachting crowd to write to the Weather Bureau about.

But in three minutes the Black Bullet was an indistinct insect of dural and steel, hammering its way into the

west, with Kerry Keen and Barney O'Dare searching for a glinting Electra. As they circled a wide area between Newark and Scranton, Keen outlined his findings about Miss Clintock. Barney nodded and his mouth grew grim.

"There it is," Barney muttered. "Flying low along that railroad between Easton and Stroudsburg. Look just this side of that factory with the three smokestacks."

"I get it," nodded Keen.

"Going down?"

"No. She's taken it over, all right, but I can't be sure about the pilot. She may have just trussed him up. Let's watch her. She may be making a contact somewhere first."

"I'd like to go down and clip her wings and watch her spin," growled Barney.

"You keep your eyes on her. We'll make her spin later—to our tune."

Keen held his position high in the sky and kept the late afternoon sun behind him. He knew the girl, if she had taken the Electra over single-handed, would have all she could take care of watching her flying. Most certainly she would never expect the Griffon to be in the air in the daylight!

"She's turning further west now," Barney warned. "Port Jervis, eh?"

"Looks like it."

"What the devil do they want that Electra for?" Barney demanded for the tenth time.

"I'm just beginning to get the idea," Keen replied. "See that open park-like place over there. It lies about five miles north-east of Port Jervis. That's the old Shorncliffe estate, and that's where Hammond was working."

"Pretty swell layout, too," agreed Barney.

"But it's not big enough to put an Electra down," Keen frowned. "What is their game?"

"Besides," Barney went on. "There must be a flock of cops and dicks around there, figuring on the Hammond murder. It don't make sense."

They were well over the big estate now and they could see the Electra sliding across the patchwork landscape below, heading for a strange rendezvous of some sort.

"Did you ever stop to think, Pulski," Keen went on, "if a man wanted to invent a silent plane, he would have to do more than just clear up the roar of the prop."

Barney's eyes twinkled under his goggles, and he nodded like a happy doll. "So that's why they want the Electra?"

"That's my guess," Keen answered. ". . . Hello! . . . put your glasses on that car . . . the auto running out of that big barn-like place. See, he's heading deep into the fields running on the private roads. A dime to a dollar that's Valentier—the guy who finished Hammond. And I'll put up another side bet we can guess what he has there."

"I got him now," Barney replied focussing his binoculars.

"And look! There goes someone out of the Electra—in a parachute!"

"A guy in blue—a pilot's airline outfit," Barney hissed. "She made him jump!"

"Good! At least she didn't blow the top of his head off. Is he Okay?"

"Sure. He's handling his shrouds to clear that railroad track."

"Now we're clear to go to work. Spot her closely, Pulski."

THE car that had roared out of the old Shorncliffe estate was driven by a man who had been Horton Hammond's assistant in some of his experiments. In the back of the car, which had a station wagon body, was a long wooden crate.

For miles the man wound through pine and thicket, steering skilfully over a road he had tried out many times, preparatory to this final coup. He watched the silver Electra by peering into his tilted rear-view mirror and smiled as he realized that at last his task was nearing its close. He had done well, with the aid of that insane girl. He had obtained the working model of the Hammond prop and the blueprints required for its manufacture. Now, he had successfully completed the job. Wouldn't Blondel Ponchon rub his hands?

He guided the car through another sheltered track that led through the woods and pondered on what he would do with all that money. There were so many things he wanted to do, but it had all happened so suddenly. There had been long months of planning—always with that one big obstacle in the way until he had learned of Ann Woodin. Then, with startling clarity, their big problem was solved. Well, they would all be well paid for this job—once they got the crate into Canada. Still, he could not get the spectre of that man in black out of his mind. The man who had successfully returned the pirated airliner safely to Newark. Well, perhaps the girl would be able to clear that up when she contacted him.

He glanced into the rear-view mirror again and saw the Electra settling down over the trees behind. He smiled at the manner in which they were making this, their last and most important contact. He tore out of the wooded roadway and emerged in a long open clearing.

The Electra was coming in for a landing, not ten feet above the top of his car. But as suddenly, a new menace caught his eye. The black amphibian—his nightmare—was screaming down at him. But before he could make up his mind what to do, there was another plane in the picture.

"Good!" he beamed. "Blondel Ponchon will be able to take care of that black swine."

He raced the car and its valuable crate out to where the Electra was growling her oleos across the turf.

But Keen and Barney had caught the move and had come down to intercept the Electra while she contacted the station wagon. Yet so interested were they, that they never saw the high-wing monoplane slamming down at them from above. Keen was busy letting down the folding pontoons which also carried landing wheels set in water-

tight boxes. That gesture saved his life, for as he leaned forward to draw up the long steel lever that set the retracting mechanism in operation, he heard something smack into his instrument board with a clanking thump.

In a flash, Keen curled the Black Bullet away and peered up. Barney was breaking out the two Hotchkiss guns in the rear, preparing for action.

"I told you!" Keen yelled. "They've got Hammond's silenced motor down there, and these guys had to come back and help load it from the car to the Electra. What a break!"

But Barney was in action now. The Mureaux, a French two-seater fighter with a 500 Hispano Suiza 12Xbrs engine and capable of 235 m.p.h., was slamming at them from a steep angle. The Black Bullet, with her big pontoons down, had sacrificed much of her speed, and it was a fight that could not have been better matched had they scoured the earth for two winged hellions like these. Both were armed to the teeth with the latest of weapons. Both were in the hands of skilled pilots. But Keen and Barney knew they faced the task of getting the enemy craft down reasonably intact—and most certainly without burning, and destroying the secret of the Hammond prop.

"Get his motor, Barney," Keen ordered, as he drove the Black Bullet through a storm of lead. "I'll take care of his wings or controls."

But the Mureaux was not to be caught easily. Keen watched the pilot and had to keep an eye on the ground to see what was happening down there at the same time. Barney fought skilfully and could see his bullets biting away at the nose of the French fighter. The Frenchman went over on his back after a short dive and they could see the snouts of the two Chatelleraults—mounted in the streamlined boxes under the wings at the point of intersection of the bracing struts—spitting scarlet death.

Barney hammered away at the motor again, and Keen ripped the amphibian up, rolled her over on her back, and hung there for what seemed seconds. He waited, it seemed, for the Mureaux to pull out of her dive. Then he plunged down, his front guns screaming.

Barney gasped at the frenzy of the attack and saw Keen's fire completely buzz-saw the tail off the Mureaux. The French fighter staggered, flopped about like a harpooned whale, then side-slipped to the ground with a splintering and wrenching of metal. It hit not twenty yards from where the Electra stood purring alongside the station wagon.

"Okay, Barney!" Keen yelled. "A gun—quick!"

"I'm way ahead of ya, Ginsberg!"

Keen rolled over, side-slipped madly, and dropped the Black Bullet down in front of the Electra, blocking it off completely. Barney was over the side, a black mask drawn over his face, covering both the man in the car and the girl who sat chalk-faced in the control pit of the Electra.

Keen slipped out, raced to the pile of

wreckage that had been a sleek French fighter. Both men were stone dead. He tore at everything within reach and finally came out with the valuable cardboard box he sought. It had been opened, but everything appeared to be intact. He came back and tossed it inside the cabin of the amphibian.

"All right, Valentier," he said to the man in the station wagon. You can back her up to the door of that Lockheed. I'll help you get that motor aboard."

"Who are you?" demanded the thin-faced Frenchman.

"My card," said the man in black.

The man addressed as Valentier took the small white pasteboard and stared at it. "The Griffon!—the man who took that ship back last night?"

"The same!"

"Then . . . then, this is the last . . . the finish. What now?"

"We'll get Mr. Hammond's motor aboard, first. But, just a minute, Valentier. One question please."

"About—about the—?"

"Where did you stand when you killed Horton Hammond last night—when you killed him with a *flechette* fired from an ancient cross-bow?"

"Then you know?"

"I know that Miss Woodin purchased an old West African cross-bow with a hinged stock that allowed certain type darts to be fired from it instead of arrows, and I know that Hammond was killed by a wartime *flechette*. You killed Hammond, Valentier!"

"Yes . . . I killed him . . . I killed him when he walked out of the workshop late last night. I stood on the roof and fired down at him. I stole the dart from his room a few days ago. I worked for him under the name of Rene Beaussart . . . on the motor silencer device."

"I figured that. Well, it's too bad. Who's your boss?"

"Blondel Ponchon, head of the International Espionage Syndicate. He was in that machine with his brother, Marcel Ponchon. They're both dead?"

"Both. Dirty business, this, Valentier. Pays well, I know, but this time you lose. Now let's get this aboard, and no funny business, either. Pulski, over there, is a bad man with a gun."

"You are going to fly this back?"

"Someone is," grinned the man in black.

"To Newark? But look across there!"

Keen turned and stared out over the trees. A dense fog was trickling in from the north-west.

"Fine!" he beamed. "That will help some."

"You'll never get into Newark through that."

"No? . . . But this Electra and the motor will."

Valentier snorted and together they tugged and lugged at the crate. It was very heavy, but somehow they got it in. They set it amidships in the aisle. By the time they had placed it, the fog was thick.

"Now we'll see about Miss Woodin. She's a transport pilot with beam experience. She'll have to take it in," Keen said coldly.

He went up through the narrow companionway and entered the control pit. The girl sat stiff in her seat, staring out through the windshield.

"Now, Miss Woodin," Keen said calmly. "You will take off at once and fly back to Newark. I'll escort you—just to make certain you find it. You'll have to ride the Bellefonte beam, of course."

But Miss Woodin did not answer. Keen leaned over, and suddenly saw a small bottle in her hand. He snatched at it. But the hand was already stiff in death.

"Well, that makes it a little easier," he said quietly. "Went out her own way."

He dragged the body away from the left-hand wheel and placed it in the main cabin.

"You fly?" he then asked the puzzled Valentier.

"No—not anything like this," the man replied. "Nothing as big as this. I'm just a service pilot—two-seaters."

"Well, you're getting a short but informative lesson in transport blind flying," grinned Keen.

HE called Barney down and explained what had happened. "I'm taking her off, Pulski," he said aloud. "You follow us and make sure everything is all right. Help me tie this bird up in the co-pilot's seat."

"You'll never get in, Ginsberg. Fog as thick as a blanket up there."

The man named Valentier stared at the two men in black and then sat down with resignation. The man addressed as Pulski, took a length of heavy sash cord from the locker—and spared no knots and hitches.

"Now two short lengths about his wrists, Pulski," Keen said. "And leave the ends long."

Pulski cut two lengths and knotted them about Valentier's wrists. The Frenchman protested that he could not fly such a ship, as he had never been behind such a wheel.

"You'll fly it—or," Keen snapped. "You might beat that murder rap, you know, but you can't beat a nose-on crash. Act sensible."

Then Keen shoved Barney out, whispered in his ear.

"I'm taking him over Montauk to put him on the Newark beam. Pick me up off the No. 3 buoy off Southampton. He'll get her in."

Barney returned to the amphibian and Keen shut the cabin door. He moved up inside the control pit, started the motors and turned the big transport around. Barney in the Black Bullet, waited behind him, until Keen was clear, then took off after him. In twenty seconds both were lost in the fog.

"Now get this, and get it straight, Valentier," Keen barked at his captive. "You can put this thing down blind, if you do exactly as I tell you. I'll run her on the robot in the meantime."

Keen turned the ship on a due east course and explained the beam and blind-landing system as used at Newark.

"In a few minutes we'll be on the beam that leads you from Montauk Light, on the tip of Long Island, direct to the beam station outside the Newark Airport. Here, put on these head-phones and you'll pick it up in a little while. You know the beam system. If you get off to the left she'll buzz the 'A' signal—dot-dash."

Valentier nodded, sullenly.

"If you get over on the right, she'll buzz the letter 'N'—or dash-dot. When you are on your beam course, the two signals intermingle and you get a steady buzz. Understand?"

"I know that much, but how do I get her in?"

"You fly the Newark beam all the way in until you reach the cone of silence, which means you're dead over the beam tower. Check your clock there and fly on dead ahead for four minutes. Get that? The four minutes will take you about 6.4 miles away from the center of the field. There's no wind tonight. You can easily come in on the long runway."

"What then?" asked Valentier hollowly.

"You will follow the beam in, as I said. Fly so that you hit the cone of silence when you are at 1200 feet altitude. Keep flying around until you do, then do that four minute gag and bank around. Throttle back—you can use your foot, because I'm going to tie your hands to the wheel—and go down at about 100 m.p.h. Actually, the cone of silence is about 8,000 feet away from the end of the runway so if on returning you cross the cone of silence at 600 feet, you will be able to glide in and hit the runway perfectly. Hold her there and keep up that 100 m.p.h. glide and you will be able to put her down like a pillow. That's the system the transport pilots use."

Keen pinned the written details up in front of Valentier and coached him in the system all the way to Montauk.

Outside, the fog was thick and soupy. They could not see the ground now and Keen turned on the beam set again and listened.

"Here we are. Here's the Montauk-Newark beam. Now we'll turn and get on it and head back toward Newark. Here, I'll call the field and have them clear the runways for you."

Valentier nodded again with resignation and stared at the paper in front of him, while Keen took down the mike.

"Calling WREG . . . Calling WREG . . . Plane No. 207 . . . Amalgamated calling WREG . . ."

In a moment he got a response.

"WREG on 207 . . . Where are you?"

"Plane No. 207 returning to Newark. Clear all runways . . . Coming in on beam . . . Give barometer readings please."

"Okay 207 . . . Barometer, Newark 29.22 . . . All runways clear . . . Go ahead."

Keen leaned over and adjusted the Kollsman altimeter for the correct atmospheric pressure and replied:

"Thanks WREG . . . Have police and ambulance on field . . . Coming in

from Montauk . . . That's all."

The operator at Newark gasped, flipped the switch of a departmental phone, and barked into it.

Keen grinned at Valentier, then got up and placed the man's hands on the big black wheel. He laced them securely in position so that Valentier could not leave his seat. Keen then lowered the landing gear.

"All right, Valentier. It's all yours. I'm going back aft—just to get out quickly when you get in. Remember, now, cone of silence at 1200. Fly on for four minutes and turn back. Get to 600 feet over the cone again and throttle back to 100 m.p.h. and let her drift in. You can lower the flaps with your other foot, too. Best of luck."

Keen took out a card and scribbled across it: "Here's your man, Scott. The girl went out—on her own. She's Ann Woodin—not Miss Clintock. Work it out yourself." On the other side was scrawled "The Griffon."

He stuck the card in the compass-deviation chart frame and slipped back into the main cabin. "No funny business, now, Valentier. I shall be back here—with a gun."

But the Frenchman was too busy making certain he got in safely to figure out an escape. He never heard the cabin door slip open, or realized that the Griffon had hurtled headlong out into the fog above Long Island Sound. He could not know that the minute he hit the cone of silence outside Newark, Kerry Keen was being picked up by a black amphibian that had followed them all the way with the aid of an infra-red ray lamp, mounted in the cockpit of the Black Bullet.

IT was 10 o'clock the next morning when Kerry Keen sauntered into Drury Lang's office with a brown cardboard box under his arm. He was in trim tweeds and wore a jaunty boutonniere. Lang scowled at him from behind a dingy desk.

"Well?" he growled, ignoring Keen's cheery voice. "What you got there?"

"Crusty, aren't you?" Keen replied. "Sorry to get you up so early."

"Get me up!" snorted Lang. "I ain't been to bed."

"Whatever happened?"

"That jane—that hostess gal—she was Ann Woodin, that girl pilot who raised the squabble about women in airline jobs out in the Middle West."

"She confess?"

"Naw . . . she's dead . . . Swallowed something."

"Nothing in the papers about it?" Keen asked with a puzzled air.

"No. We don't know much about it yet. But say—what's this?"

"Hammond's prop. You wanted it, didn't you?" Keen said quietly as he lit a cigarette.

"Where'd you get it?" Lang was eyeing Keen with undisguised suspicion now.

"I . . . found it . . . It's yours to take back. That was the bargain, wasn't it?"

Lang stared across at Keen with a beady eye. He transferred his gaze to

Advertiser's CONTACT

A LITTLE NEWSPAPER DEVOTED TO A BIG CAUSE ★ OF, BY AND FOR FLYING ACES CLUB!

VOLUME 20

MARCH, 1936

WHOLE NUMBER 31

F. A. C. Radio Communications Corps Growing By Leaps And Bounds!

ORGANIZED a few short months ago, the Radio Communications Corps of the F.A.C. is progressing in a measure far exceeding our fondest expectations. Already there are about thirty-five stations belonging to our "network." And more are signing up almost daily.

As has always been the case with the club, cooperation has been the watchword. No sooner had we announced this new and important department than in came a letter from Bob Cottom, 620 E. Sixth St., Cherryvale, Kans., offering his assistance to members interested in short wave. As a result of his offer to furnish fellow F.A.C.'s with receiver diagrams with which he had been successful, he became so "swamped" that an S.O.S. to GHQ became necessary. And so we're happy to advise you Buzzards that we're now in a position to furnish diagrams to all who are interested, free of cost. If you're a beginner, we'll be glad to send you a simple diagram for a one tube receiver; if you've had experience we'll shoot along

a more complicated diagram, affording a greater receptive range.

With all the big passenger transports equipped with radio, interest in short wave on the part of aviation enthusiasts and model builders is only natural, but we want to correct a false impression entertained by many of our readers. The cost of construction of a short wave set is not as steep as many of you imagine, and any reader who can build a plane model can easily construct a set merely by following the same procedure followed in model construction—by paying attention to small details and following directions faithfully.

Those members of the F.A.C. who are licensed operators already know of the fine work being carried on in behalf of the club by Captain Lionel K. Berig, The Dawn Patrol, Inc., Boston, Mass. This F.A.C. unit owns and operates 27 radio receiving stations and one emergency transmitter—the stations standing watch over the International Distress Band, the Aviation Bands, and the 160 meter Amateur Band. Call letters are: Fleet & Division Headquarters, DPIHQ, and the other 26 stations are DPIA to DPIZ, inclusive.

Captain Berig has just written that in his estimation it would be a fine thing if certain "key" stations of the FLYING ACES CLUB could send out general messages to all stations of the R.C.C. net, in order to bring them closer together and also to exchange ideas on aviation. We agree, and very shortly messages to all F.A.C. stations will be issued over DPIHQ, Boston, Mass., and W8FTB, Rochester, N. Y.,—the most powerful stations in the F.A.C. net.

We sincerely trust that those readers of FLYING ACES who already operate amateur stations and who have not signed up, will do so immediately, since every station can be of invaluable service to the club. To those who are not already dabbling in short wave, we'd suggest that you write to old ACES UP, care this magazine. In return we'll send a diagram and will be glad to answer any questions you may ask, and in conclusion permit us to issue a general warning—don't go on the air without a license, since both a station permit and operator's license are required by law.

Efficiency Plus—



Capt. L. K. Berig at the Key of DPIHQ

Thoughts On Window Trimming

THE other day we received a letter from our old friend, Bob "Pepper" Martin, expert FLYING ACES window trimmer, of Milford, Utah. Bob apologized for not having sent us pictures of his customary displays, and his letter contained a sentence which gives us a happy thought. The sentence to which we refer reads: ". . . unless I can find time to make a few more models the next window display I tackle will be a flop."



Bob "Pepper" Martin

There's no use denying it, fellows — well constructed models go a long, long way in helping to create effective window displays. This has been proved time and again by actual sales records, so we can't blame Bob for feeling that displays, minus models, wouldn't be quite the thing, and here's where our "happy thought" comes in.

If you're a model builder and would like to be of some real service to your club, you can do so by loaning some of your models to your friends who get a "kick" out of trimming windows. Sometimes the most expert window trimmer is a poor model builder, or he may find himself in Bob Martin's position—with insufficient time to do both. Perhaps in your own unit this very situation exists, unknown to yourself, so make some inquiries and by a little teamwork some really nice displays will result.

While on the subject of window trimming ACES UP is reminded of a rather unique stunt employed by Charlie Riley, Commander of the Philadelphia district. Charlie not only uses his window displays to sell additional copies of FLYING ACES but to increase the membership of the Philadelphia unit as well. In every window he places an attractive arrangement of a page of the FLYING ACES awards, taken from a back issue—you know, the page headed, "Join The Flying Aces Club." This he pastes on cardboard and at the bottom neatly letters in the address of the unit, telephone number, etc. And to use Charlie's own words: "You'd be surprised at the number of fine recruits, actually interested in aviation, that we've signed up in this manner."

the box.

"And that monkey, Valentier, said a guy named Ginsberg took it," Lang finally muttered aloud. "What the devil is this all about, anyway, Keen?"

"What?"

"Well, get this. It's a pip. Last night, during the fog, the Amalgamated control tower got a message that Plane No. 207—that was the ship they were sending that Miss Clintock down to Florida in—was returning. A call came in for police and ambulance assistance. And almost at the same time, they got a phone message from the pilot—a guy named Newland, who had first taken it off—that he was down somewhere outside Port Jervis, and that he had been tossed out of the plane at the point of a gun by the girl."

"But they were going to Florida. Why Port Jervis?"

"Don't ask me. This thing is screwy enough already. Anyway, they cleared the runways and in a few minutes one of these Amalgamated ships comes down through the fog and makes a landing—Lord knows how. We couldn't even see it until it was on the ground."

"These new beams, Lang," Keen muttered.

"Beams hell! Who do you think flew it in?"

"The Griffon again!"

"Naw! It was this guy, Valentier, who had pulled the show the night before. He was tied down tight and his hands were roped to the wheel. And in the cabin sat this Miss . . . Miss Clintock . . . Woodin—dead as a door nail!"

"Amazing!" Keen gasped.

"I think you're sarcastic," snarled

Lang, glancing sideways at his guest. "But anyway, there he sat trussed up, but able to fly her in. And in the back cabin was a motor—"

"A spare motor?"

"Spare hell! It was another invention of old Hammond's. A silenced motor to go with the silenced prop."

"But—" Keen remonstrated.

"Stow it! It was pretty important—more important than the prop, they say."

"But what explanation did this Valentier make?"

"None that sounded reasonable. There was a card stuck up in front of him. Yeh, the Griffon again, and if I had not called you last night a few minutes after we unhooked him, I would have had you cold, Keen."

"But I *might* have been in on it," Keen smiled.

"No. You couldn't. You see, this Griffon guy came in with him, just as he had done the night before—and disappeared in the darkness before anyone from the hangars could get to the plane."

"Got away in a black plane again, eh?"

"Anyhow, this bird spilled the whole story about the girl and the plan to get both the prop and motor out of the country. They were working from a joint somewhere up in New Brunswick—across the border—and they almost got away with it."

"So the Griffon got them all, and you're all cleaned up on this case, Lang? Well, here's the prop. You can report in triumph now."

"Um . . . But I still can't figure that Griffon guy. You know, Keen. Yester-

day, I was as sure as the devil, you were the guy, but this mess last night cleared you entirely. The punk in the cockpit said there were two Griffons—one named Ginsberg and the other Pulski, but that's a Barney of course."

"What about Hammond?"

"Now there's a story, Keen. I managed to clear you on that one. This bird—and I took a lot of trouble getting to the bottom of this—killed Hammond with that dart thing of yours. Fired it out of an old cross-bow! You're a lucky guy, Keen. We had you planted for that."

"Thanks," replied Kerry, looking relieved. "Then I can go, now?"

"Sure—but wait a minute. You didn't tell me how you got that prop."

"I don't have to, Lang. *You* got it. But if there's any reward, I want my cut."

"Reward? Say, there's twenty-five grand. But I can't take it."

"Good. I can—and I need it. You know my address? Then that's all."

"Well . . . er . . . yes. But I would like to know how—"

"Never mind, Lang. Look here, I'll give you a good tip instead. You want to know who the Griffon is?"

"Do I?" the dusty detective gulped.

"Well, personally I don't like that story about pilot Newland being tossed off that airliner by that girl. After all, she's dead and can't defend herself. I'd tail that man, Lang."

"By gorry, Keen, there might be a lead there," gasped Drury Lang getting to his feet.

And Kerry Keen, perfectly satisfied that Lang should direct his inquiries along that line, sauntered out.

Happy Landings

(Continued from page 27)

true; for international commerce is a big thing, as was discovered in 1914-17. It proved sufficiently important to be listed as a reason for war when German U-boats were sinking American merchant ships.

LET us presume, that Japan decided to take over a protectorate of the Philippines and then move farther southward and threaten British possessions in the South Seas. What do you think Great Britain is strengthening the defenses at Singapore for? To stop Chinese junks from raiding Borneo?

Let us go a step further and visualize Japan blocking out American air liners and preventing their landing at Manila or Macao on the assumption that the American mails were carrying British

government military documents. All legal cargo in every sense, but the event might hurl the United States into a whirlpool. Let an American Clipper ship be shot down or a Pacific air base bombed, and— Well, you finish the sentence.

And so, with the enthusiasm and financial courage so evident in the organization of a trans-Pacific air line, we get in return prospects of far greater national defense requirements. The Navy will have to be strengthened and a new air-arm organized. New bases will have to be built and more men trained to man them. The air enthusiasts will glory in the prospects of openings in the services. The circle of circumstance will widen and widen.

Will naval treaties come out of all this? The creed of "no entangling al-

liances" will have to be broken, should such a move be made. Noted writers have suggested several such possibilities, but America has seen the result of these "scraps of paper" and will no doubt shy off. While a naval alliance with Great Britain might work out well in theory, we all know that Britain is up to her ears in international strife. The odds would be all against the United States keeping out of trouble.

That's a great air line they've built out to the Orient. A masterpiece of keen planning and courageous enterprise! The men who are manning those grand ships are among the most skilled in the world, but a greater Navy and a greater Air Service will have to be devised if we're going to defend those bases.

Candidates for flying boat instruction, this way, please!

Russia—The Air Power Enigma

(Continued from page 18)

system for building them, and the designs. The big problem noted so far is the lack of skilled workers and enough modern factories to turn out all the equipment they want. Another point that must be considered, is that

while Russia has all the raw materials, wood, coal and steel, her progress thus far in transportation has been held up, and factories are not as yet working full time, owing to the lack of supplies.

Once these points are remedied, there

is no reason why the Red Air Force cannot be brought up to a strength of at least 10,000 fighting planes.

Next month, we will return home and attempt to give a general outline of the United States Air Services.

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Doin's in the Dunes

(Continued from page 14)

fully. A Spad's Hisso turned over, made an awful clatter. The Old Man ran downstairs and out onto the field. He yelled at Lieutenant Pinkham. Phineas turned and yelled something back, but the C. O. could not catch it. Major Garrity swore, then waved his arms when the Spad shot away and lifted into the aerial soup.

"Casey!" he bellowed. "Ser-r-r-re-gent Casey! Come here you—"

The non-com came running to the farmhouse, stopped to look at his commanding officer.

"I—he said you give him orders to leave early," Casey yelled. "He—"

"Wh-What did he call me when he climbed into that Spad?" Garrity cracked. "If it's what I think, I will call up Issoudon and have him arrested."

"It was, sir," bleated Casey. "He says to go dunk your dome, you lantern-jawed wart hog."

"Don't you call me names, Casey! You're busted—you—!"

"It was him what called you that, not me, sir," gulped the Flight Sergeant. "The loot says it—not me. He also says to tell you he couldn't join the Foreign Legion anyways as no dame ever threw him down an' his name ain't Smith. I can't see no sense to it, can you, sir?"

Garrity reached for a rock and flung

it at Casey. Then he tore inside to get at a telephone. "I'll show that mug-wump. They'll put him in the klink the minute he lands at Issoudon. Oh, I've stood enough—"

However, Phineas Pinkham never arrived at Issoudon. He miscalculated quite as badly as a man who buys a train ticket to Canada to join the Texas Rangers. Phineas found the ceiling zero and was almost on the point of turning back. Second thought changed his versatile gray matter. He had no desire to go to Issoudon and train new pilots, so why go there? Here was an excuse to keep away from such a humdrum existence. He pointed his nose southeast and let the Spad have its head. Although he was unaware of the fact, Lieutenant Phineas Pinkham was headed for the most cock-eyed adventure of his hectic career.

"Haw-w-w-w-w! That is what I'll tell the old tomatom! My compass went haywire an' I got lost in the fog, and I flew an' flew until the gas give out an' there I was—of all places—in Switzerland! Why you could've knocked me over with an empty egg shell—"

It was tough going. The prop churned up big gobs of spray and tossed it back into Phineas' grinning physiognomy.

"It's a good thing I didn't strap my trunk on the wings like I figured," the Boonetown, Iowa, Merlin mused. "I will not need it. It is my bag of tricks that is most important and they're right at

my feet! I hope the Switzerlanders have a sense of humor, haw-w-w-w!"

TWO hours later Phineas pulled up the Spad's nose. The mists were still thick enough to be made into blankets and Phineas did not want to hit the top of an Alp. That flying time should have brought him over the land of St. Bernard dogs and yodelers. But halfway through the next hour, the pilot began to get worried. His gas would not hold out much longer. He took a chance and cut down altitude. Breaking down through the thick ceiling, he shivered and gulped.

"I must've missed the Alps or I would've tripped over 'em long ago. Oh-h-h-h-h-h-h!" The Hisso skipped a couple of beats. It coughed and bogged down. The jokester from the States had to set his Spad down somewhere. Five hundred feet up he spotted a mist-choked countryside. The outlines of a small cluster of buildings became visible. Nearby was a stretch of real estate dotted with sheep.

"Haw-w-w-w-w! They're as good as a flare. It will be flat where they are."

Again Lieutenant Phineas guessed wrong. When he crawled out of the wreck of his Spad, he found out that he had tried to make a three-point landing on terrain that slanted away at an angle of forty-five degrees.

"I would not have been much use at Issoudon," the Boonetown strayer mumbled as he limped toward a small

farmhouse. But an angry Frog peasant met him halfway.

"*Sacre bleu, ze sheeps voose keel, non? Chien! Peeg! Ze crazzee flyeeng machine she ees—oui? Voose donnez moi l'argent!*"

"All you think of is dough, you Frogs," Phineas yipped. "Shuttez voose trap an' tell me where *je suis*—compreenny?"

The Frog pointed toward a signpost that hung drunkenly from an old post across the fence. The pilot stared, read—"Marseilles—8 kil.," and sat down on the wet turf, his brain doing an Immelmann.

"*Vous est malade,*" the Frog peasant said. "*J'ai le vin blanc chez moi.*"

Twenty minutes later Phineas, stomach warmed by the potent fermented juice of the Frog grape, trudged toward Marseilles.

"Boys, I am far from home in any language. Well, I will git a boat—no, I will git shot if I do. Even a Philadelphia lawyer wouldn't take my case now. Well—huh—" He turned at the sound of cart wheels. A two-wheeled vehicle drawn by a bony nag loomed up in the fog. Phineas hailed the peasant and was granted a lift. An hour later the miracle man drove the nag into Marseilles, down the famous Rue Noailles. He was all alone.

"I hope the Frog won't catch pneumonia back in that ditch," he chuckled. "Haw-w-w-w-w! But I am desperate an'—" He yanked his peasant hat down over his eyes and glanced about. Marseilles seemed over-ridden with Frog doughs. Phineas drove the cart into a side street and stopped the ancient equine. Just ahead an old sign creaked on unoiled hinges. A faded, tattered French flag fluttered beneath the words "Cafe Napoleon." Phineas reached the cobbled street just as a Frog soldier emerged from the dingy emporium. The man stopped, looked up at the flag, and spat at it.

"Why, you traitor you!" yipped the Yank and leaped. He poked his fist into the soldier's prop boss and grounded him. Lest the noise of the man's *descendu* penetrate to the cafe, Phineas reached down and dragged the *soldat* across the cobblestones and in through the open doorway of a Frog house. The place appeared untenanted. Phineas shut the door behind him, looked down at his victim. The man's coat collar was open and something dangled from his neck. It was a small bottle with a label pasted on it. By the light of a match the pilot on the loose attempted to read the label. The flare caused the Frog to stir and Phineas poked him again to render him *hors de combat* once more. This time he ripped the bottle loose and studied the peculiar characters scrawled upon the label. For a minute they stumped him, looking like Chinese at first. Suddenly he thought of a trick ring he had once owned on which the same kind of characters had been engraved. Arabic!

"Wh-Why—what is a Frog doin' with—why I believe I—what the—I'm—haw-w-w-w-w!" Phineas' jaw muscles bulged then and he took a knapsack from around his shoulders. From

it he drew forth a wicked looking knife and a small bottle of red fluid. The knife blade was a queer looking thing. It had a big semi-circular piece cut out of the blade into which a man's wrist would just fit. Phineas uncorked the bottle, poured some of the red contents over his victim's wrist. He waited then until his prisoner got his marbles back. The Frog opened his eyes, stared stupidly at his captor, then tried to raise his hands. He wondered why one wouldn't move and looked at it.

"*Mon Dieu!*" he choked out. "*Sacre—ze arm—ze arm you have cut heem almos' off: Ze blood she run—non—stop thees—Gott!*"

"Huh?" gulped Phineas. "Make up your mind. Are you a Heinie or a Frog? Haw-w-w-w-w! Boys, have I stepped into somethin'. Come clean, you bum, or off comes the flipper! What is in that bottle? What's the idea of insultin' the colors of *la belle France*, huh?" He bore down on the knife blade and the captive turned as pale as a quart of milk and tried to yell. The Pinkham palm clamped down over his mouth.

TEN minutes later the Boonetown flyer was in possession of knowledge for which the Allied powers would have given half the A. E. F. monthly payroll. The man on whom he was sitting was a German who had enlisted in the Foreign Legion before the outbreak of the war. He had been sent to France in 1916, had been taken prisoner by the troops of his mother country. Astute Kraut brass hats had worked on him, had found that the prisoner's one ambition had been to get back to the land of *wienerschnitzel* and *schnapps* from which he had strayed when a waxen-haired fraulein had given him the ozone in favor of a beer garden impresario. Now Wilhelmstrasse had been looking for just such a man. He had been to Africa. He would go back bearing a message to Sidi Okra, the Scourge of the Oases. Knowing that Frog troops were to be sent back to try and hold the Moslem boys in check, the brains of Wilhelmstrasse had seen to it that the Heinie Legionnaire was put back into North African circulation. And in the lining of his coat had been sewn a blank piece of paper. Around his neck had been tied a small bottle of purple liquid.

"Haw-w-w-w-w!" chuckled Phineas. "*Merci* beaucoup. You see this knife is just a fake, *mon homme*. Look at the blade. That blood was red catsup. Well—huh, did I fool ya! Haw-w-w-w-w!"

"*Peeg—schwein—chien!*"

Phineas had to put his man to sleep again. Twenty minutes later he sidled out of the Frog house dressed in the uniform of the French Army. The blank sheet of paper was in his possession. The little vial hung around his neck. From his ever-resourceful knapsack he had produced a black wig and a false nose that was identical in shape to that of the pseudo Frog he had just left securely tied.

"Well, I giss I am in the Intelligence Corps now," Phineas chuckled as he walked out of the Rue Noailles, his collection of odd novelties and tricks re-

posing in the pockets of the Frog uniform. "Haw-w-w-w-g! It takes a Pinkham."

As he plodded along the street the nomadic Yank wondered how he was going to get that message translated. Oh, he knew it had been written so that the writing would be invisible. That purple fluid had given that away. That would be a liquor made of stewing up violets. It would reveal some Arabic written with onion juice. Phineas' ample proboscis had caught the faint odor of the weepy tuber when he brought the nose and blank paper together.

"They aren't very smart, them Krauts," the wizard extraordinary grinned and headed for the waterfront. "The ex-Legion guy said he didn't know what was in the message. All he was to do was hand it to a sheik in Sidi Bel Abbes by name of Beni Hazzit. Haw-w-w-w-w! Allah won't be praised when I git through. Well, I got to find where the Frogs are sailin' from."

THE succeeding forty-eight hours were a nightmare to Phineas Pinkham. Three hours after leaving the Cafe Napoleon he was one of thousands lined up on a parade ground getting insulted by a diminutive Frog sergeant. Two hours after that he was on a troop ship bound for Oran. Sinbad, compared to Phineas, was never out of his backyard. And while the steamer was weaving its way through the maze of harbor craft, a Frog peasant's wife was opening the door of a cottage near Aix to see her spouse dressed up in the uniform of the Yankee Flying Corps. It fit him like an elephant skin would cloak a mule. And in a small Marseilles side street, an ex-Legionnaire, who had broken loose from his bonds, was staring at the peasant smock that draped his bony frame and wondering how he would ever get back across the Rhine. The world was a crazy place with Phineas Pinkham loose in it.

The Boonetown miracle man landed at Oran in due time, spent torrid hours there in hot stuffy barracks before entraining for Sidi Bel Abbes, African headquarters for the Legion. There the soldiers shed Western Front regalia for the cooler outfit of the Legionnaires. Phineas got a squint at himself in a mirror and wondered when he would wake up.

"If Babette only could see me now," he mumbled. "She would think it was her fault, haw-w-w-w! I wonder why they wear a curtain at the back of their domes? And these ice cream pants—!"

It occurred to the Boonetown flyer that Lady Luck was riding on his empennage. From the time he had left Marseilles other troops seemed willing to give him as wide a berth as they would have tendered a polecat.

"I giss John Smith was not much of a mixer like a dyspeptic landlord," Phineas had mused on the way across the Mediterranean. "I will be as nasty as I know how."

Twenty-four hours after the troops arrived at Sidi Bel Abbes the word went around that they were to leave

for the Moslem front early in the morning. Legionnaires were given liberty in the Algerian town and Phineas headed for the Cafe of one Abdul Kazam where unbeknownst to Allied brass hats skullduggery was the chief stock in trade. Crossing the Place Sadi Carnot, Phineas paused to take inventory of things he should have with him. A pair of Arabs shuffled close, clad in voluminous burnouses.

"If it got *really* hot here," Phineas sweated, wiping big globules of perspiration from his brow, "I bet them Allahs would send for a load of raccoon coats. Boys, I could fry an egg right on my dome right now. I wonder where the hangar is where they keep their camels, haw-w-w-w-w!"

The plane-less pilot reach the Cafe and walked in. Scowling beetle-browed Arabs choked the place. Four of them crouched near a water pipe, sucking at the tubes noisily.

"I giss they're Scotch Arabs," grinned Phineas. "I bet they all use the same toothbrush. I—uh—er—gulp!" A great Spahi blocked the Pinkham runway, grunted something unintelligible and reached for a scimitar big enough to behead a rhino with one swipe.

"Beni Hazzit," Phineas gulped. "*Bismillah*—Allah be praised an' all that! I come from big white papa in Potsdam—er—Allah eel Allah!"

The big Spahi motioned Phineas to a back room, screened from the cafe by heavy drapes. Three Arab beauties, faces veiled, eyed Phineas curiously.

"Hello, Fatima," the Yank tossed out. "Haw-w-w-w-w!" The Spahi growled, shoved him up a stairway covered with carpet as thick as a deep-dish apple pie. Again draperies were tossed aside, a fancy carved door opened, and Beni Hazzit stared at Phineas, alias John Smith, Legionnaire Number 0999333.

The Spahi was waved away. Phineas wiped his face with a handkerchief and wondered why Beni Hazzit could look so cool. There were several beads of sweat on the sheik's dark brow, that was all. He was a skinny Arab with a long crinkly black beard. Beni Hazzit looked at Phineas closely without speaking for several seconds, then held out his hand. Lieutenant Pinkham, alias John Smith, looked at that hand, felt icicles sprout out from his spine although the temperature was more than one hundred and twenty-so-and-so at the bottom of an oasis well. His eyes wandered. He saw the edge of something protruding from under a couch. The sunshine coming in through a latticed window made it sparkle.

"You have thees?"

"*Oui*—yeah—*ja*—uh—er—could I have a drink of—" He pointed to his throat and coughed. Beni Hazzit nodded, clapped his hands. Shortly the big Spahi brought a bottle of wine. Beni Hazzit poured some into two glasses, handed one to Phineas. The amazing flyer from France sat down on a hassock close to the sheik and sipped at the brew. As he did so, he reached into his pocket for the paper he carried. Beni Hazzit snatched for it as if it were a reprieve from the guillotine. Phineas

put his glass down, reached his fingers up his sleeve furtively. He made strange passes over one of the glasses while Beni Hazzit gloated over the blank paper.

"Ze—bottle—son of a pig! *Avec le* purple juice! Veet!"

"Don't ya call me names, ya—uh—haw-w-w-w-w!" Phineas stuttered. "Here it is."

Beni Hazzit picked up his wine glass later and drained it in one gulp. An hour later Phineas came down the stairs on the heels of the Spahi, his burnoose drawn up around his face. But there was a crinkly black beard jutting out from the cloth and Phineas' face was the color of walnut furniture. He had left Beni Hazzit, or whoever he was, under a stack of pillows and drapery upstairs. The Heinie agent was sleeping the deep sleep provoked by a double dose of morphine. Two Arabs closed in on Phineas as he came down into the cafe.

"*Balek!*" Phineas yipped at the Moslems as he headed for the door. It meant get out of the way in Arabic. The Boontown pilot had picked up several words on his way across from Marseilles. The two Arabs who crowded him seemed to lead the way for him. They led him to the outskirts of Sidi Bel Abbes where three camels were waiting.

"*Bismillah!*" Phineas grinned and tested his beard to see if it was stuck fast. He got onto the back of one of the desert ships and the ruminant immediately got to its feet. "Boys!" gulped the rider, "they grab up altitude fast. Well, it is the first camel I ever saw without no power plant! Haw-w-w-w-w! I would like to see a Limey ride one."

Phineas never knew that camels could rock like the one he rode. No one could have convinced him that a guy could become seasick on the Sahara. But after a while he got his gastro-nomic organism on even keel and took stock of the situation.

"That Beni Hazzit—who I am now s'posed to be—was a fake," the Boontown pilot grinned into his beard. "By Allah, he should have stained his arm, too. When he reached out that flipper—Oh, I am wise to everything now—that spur on the boot under the couch—he's a Heinie officer! I bet they have spies in Borneo, them Krauts! Well, I still have the bottle an' the paper an' all I got to do is find out what the Heinies wrote. Haw-w-w-w, if the Old Man and the bums could see me now! Sheik Beni Hazzit Pinkham—Allah be praised!"

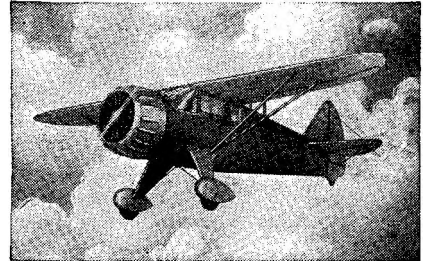
ACROSS the hot sands the Arabs led Phineas to a great oasis near Debdu and there were the ruins of an old Legion post. Crouching among them were three great Moslem brass hats and the one ranking over all was Sidi Okra, the Scourge of the Oases.

"*Bismillah!*" piped Sidi. Phineas felt a trifle chilly.

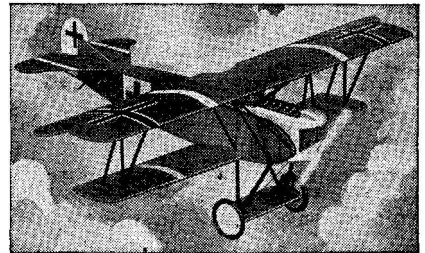
Without a doubt this sheik was the worst looking thing ever to walk on two legs. He had a scar that reached from ear to ear, spanning the bridge of

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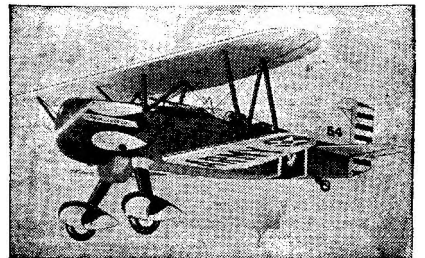
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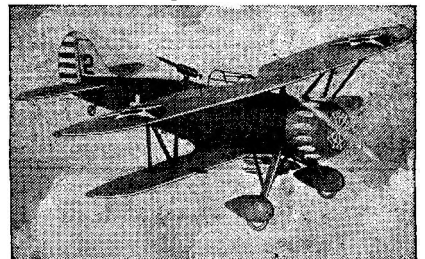
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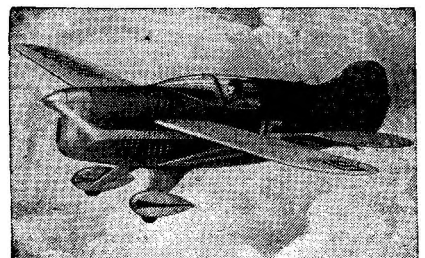
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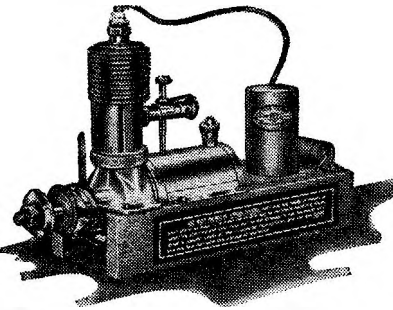
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his hooked nose. His eyes were green and yellow, and when he opened his mouth he flashed a set of teeth that could outbite a shark.

"Allah is great," Phineas said as the camel hunched down on its undercarriage. "There is nobody like Allah."

Abd-el-Fizz was not much prettier than his playmate. He muttered something to the other sheiks and then motioned to Phineas. The Boonetown flyer, feeling like a succulent rabbit caught in a telephone booth with a beagle hound, walked into the ruins of the fort. He drew out the folded blank sheet of paper and handed it to Sheik Sidi Okra. Abd-el-Fizz yanked the bottle from his neck and nearly ruptured the Pinkham Adam's apple.

"Haw-w-w-w-w!" Phineas emitted weakly and settled down by an evil-smelling fire. He watched the Arabs open the paper and pour the purple liquid over it. In the firelight he saw Arabic writing appear on the paper.

"Allah — il — Allah!" yelped the sheiks and unleashed a mess of gibberish that was all Greek to Phineas Pinkham.

However, the Boonetown self-appointed member of Intelligence had something else up his sleeve. An ace in the hole, so to speak. He produced a big black cigar from his pocket, lighted it, and sat back to enjoy its fragrance. The smoke from it skirled close to the hawk-like schnozzles of the sons of Allah. Sidi Okra sniffed and grinned expansively. Abd-el-Fizz gestured wildly and Phineas caught on. The Moslem boys were succumbing to the aroma of fine tobacco.

"Bismillah!" observed Phineas and took three other cigars from inside his burnoose. He handed them around, then sat back to wait. While the disciples of Mohammed lighted the weeds, Phineas' head swiveled. The Arabs who had escorted him to the oasis were sleeping peacefully near the camels. Time passed. In the light of the dying fire the face of Sidi Okra seemed to have acquired a coat of whitewash. One sun-tanned hand was pressed close to his diaphragm. Abd-el-Fizz shot Phineas a murderous look which suddenly changed to one of defiance as he resumed his puffing on the weed. Sidi Okra and his brother in skullduggery did likewise. Would they let an infidel German dog show stouter stuff than sons of Allah? No! A thousand Arabic no's.

"That's the spirit!" chortled Phineas. "Don't be sissies. Them assafoetida leaves mixed in those ropes won't do your livers any good, though. Haw-w-w-w-w!"

Time passed. Sidi Okra had difficulty in holding the last inch and a half of his weed. Abd-el-Fizz did not try to. His dark physiognomy now the hue of *blanc mange*, he got up and staggered out to get some desert ozone. The third sheik sat gaping at Phineas with eyes that looked like a couple of glazed nuts. And still Phineas puffed on in apparent enjoyment of his own stub of twisted tobacco. Suddenly Sidi Okra swallowed hard, held onto his stomach with both hands.

"Now is the time for all good men to come to the aid of the Allies," recited Phineas in high glee. He picked up a chunk of masonry as big as a loaf of bread. He bopped Sidi Okra over the scalp, whirled and crowned the other sheik, then went out and walked toward Abd-el-Fizz, the Butcher of Biskra. At the moment that sheik was as harmless as a consumptive kitten. Phineas had only to tap him lightly above the left eyebrow and he settled into the Sahara sands with a peaceful sigh. From the sheik he secured the message from Potsdam and headed for the camels. A Moslem camel rider stirred, got up and stared toward the dark heap under a date tree.

"Wallah-h-h-h-h!" KERPLUNK!
"There goes his three teeth. He will talk gum Arabic for awhile now," Phineas chuckled and leaped at the other son of the desert. A stiff right to the chin and there was no more opposition. Quickly the Yank shed his burnoose, reached into his pants pocket for his Legionnaire kepi cap and drew it down over his black wig. He pulled off his beard and tossed it into the sands.

"Once more I am John Smith of the Legion," he grinned and climbed aboard a camel. "It's a caution how these bed-sheets will cover a multitude of shins, haw-w-w-w! On, sturdy steed, for Sidi Bel Abbes. I must get a friendly Arab to do some translatin'."

NOW Phineas had no way of knowing but Intelligence officers of the Frog army had long been suspicious of Beni Hazzit. Even as our hero had been hobnobbing with Sidi Okra, a Frog officer had found a bottle of walnut stain in the effects of one Colonel Toussant of the Legion. Putting two and two, as well as three and three, together, an indignant Frog officer led a band of Legionnaires to the Cafe of Abdul Kazam and turned it upside down. There they found the still comotose figure of Colonel Toussant with his face stripped of its beard and his skin stained from shoulders to scalp, from finger tips to wrists. Arabs, they found out, had let some other fake sheik get out of town. Orders flew like wildfire. Two battalions of Legionnaires stamped out of Sidi Bel Abbes and headed for Debdu.

Stranger things were to happen to Phineas. Three miles from the oasis, he heard a familiar sound over his head. Looking up he spotted a Frog plane and it was heading for the sands. The motor was skipping like an old maid's heart while the owner watched a Clark Gable flicker. Phineas watched the sky wagon, a Nieuport, land not more than a hundred yards from his camel. He coaxed the long-legged ruminant to scotch down so he could dismount. Phineas ran over to the crate and grinned at the pilot.

"What ees eet wrong, m'sewer?"
The Frog pilot swore, shook his head. Phineas soon discovered the trouble. It was a loose wire. The Yank climbed into the ship and began to test the Clerget-Rhone. It purred like a kitten. He got out while the French airman

gaped at him.

"You air ze flyair? Mais non, you air ze private in ze—"

"Look what's comin'!" exclaimed Phineas, brain clicking fast. "Look—Arabs!"

The Frog turned. Something hit him behind the ear. When he awoke the Nieuport was gone. He was sitting in the hot sand and his empenage felt shriveled. A sheet of paper was pinned to his tunic. The Arabic figures on it fooled him, but the English scrawl was plain enough.

"Dear M'soor—It pained me to do it but I will get shot if I don't get back to my squadron in la belle France. Give the Frog brass hats that Arab writin' as it should mean somethin' to them. I could not wait to find out, haw-w-w-w! You can see the Kaiser has put the Kraut eagle on it as Sidi Okra wanted proof it did come from Berlin. He is a business man, that sheik, non? Get to the Oasis and pick up the bum before he starts anything more. That cigar must still have him gaga. Adoo for now. Lieutenant Phineas Pinkham—Bar-Le-Duc, France."

"Sa-a-a-acre bleu—Peenkham. Mon Dieu!" The Frog pilot wondered if he had gone *cafarde*.

The Legion troops found him a half hour later trying to coax the camel Phineas had left for him to kneel down but it was a mulish camel. At sight of

the Legionnaires, the pilot yipped for water and drank two canteens dry, after which internal ablutions he handed the paper to the Colonel of the Legion. The man took one look, yelled an order, and his troops hied back to Sidi Bel Abbas. A friendly Moslem there translated the message from Potsdam. The Frog brass hats almost had a stroke at the tremendous importance of it. On the way from Germany, due to appear off the shores of Rabat, cruised a big transport submarine, the first ever built by the Heinies. On board were two thousand machine guns and enough ammunition to reduce the population of northern Africa by half.

"Thees ees what ze Moslems wait' for, *oui!*" screamed a Frog general between leaps. "*Sacre*—we blow ze German boat to bits. Ze Arabs weel reach not near Rabat—ah—*voila* thees Peenkham. Who ees he—eh?"

The Frog airman groaned and sat down. "Maybe ees you have not hear of Jeanne D'Arc *aussi, non?*"

WHAT of Phineas? We pick him up skimming over the Rock of Gibraltar, an expansive grin wreathing his homely countenance.

"That is not Gibraltar," he exclaimed. "I must be lost again. Where is the insurance sign?"

An hour later his Nieuport was burning nothing but castor oil and was throwing it back into his face. He

landed in France not more than forty yards from the Spanish border. Three days later he dropped off a camion on the drome of the Ninth Pursuit Squadron. A self-respecting scarecrow would have shunned him by that time. Phineas had a queer look in his eyes and he did not have to fake it. Major Garrity grabbed at him, waved a fist.

"So you didn't go to Issoudon, huh? Where did you get that suit? That's a Foreign Legion outfit—or it was. You been in Afri—? Oh, you can't make me believe that. You—"

"Oh go 'way," Phineas sighed and sat down on the ground. "I got lost—I got amnesia—prove that I didn't! Git away, I'm goin' to sleep."

Major Garrity did not believe it even when the news came across the Strait of Gibraltar to Spain, across France and into Bar-Le-Duc. The Allied brass hats acclaimed Phineas of Morocco and forgot all about Lawrence of Arabia. They came in bunches to shake his hand and promise him medals. And through it all the Old Man just sat counting his fingers. Finally he collared Phineas and told him to come clean.

"*Bismillah!*" was all the Boonetown pilot would say. "Allah is good! No matter what I say you will still be an unbeliever. Haw!"

The next day the Wing suggested that Major Rufus Garrity take a leave of absence. It seemed that he was nowhere near himself.

Ackemma Ace

(Continued from page 25)

them for the next patrol scheduled to cross the German lines.

Often, while waiting for the first faint hum from away up in the blue sky to betoken the return of the patrol,

Peter fell into vivid day dreams of flying and fighting over the front lines, of shooting down innumerable Huns, of knocking down big bullies like Sergeant Hendry, of being a hero. It was

nice to be a victorious fighter, even if it was only in his dreams. If only this war were different, if it was like it was in all the books and movies, then, perhaps, he would really be a hero.

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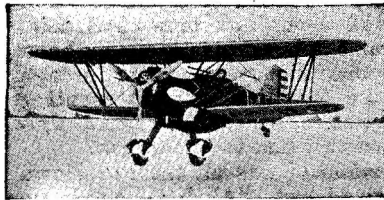


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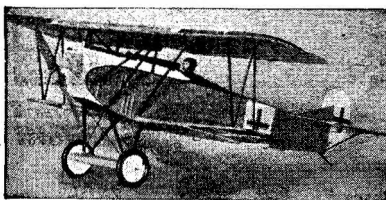
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But not in *this* kind of a war.

A crescendo hum, rapidly changing to a deafening roar, betokened the return of the patrol. Peter sighed, felt discouraged as he came back to the everyday world about him. He would always be an insignificant little mechanic leading a humdrum, monotonous existence while others fought and won.

One by one the speedy little ships zoomed over the hangars, their motors died down, and they bounced across the field, their tails skids digging deep into the dry soil and sending up clouds of dust.

Peter trotted over to his ship. Lieutenant Barington slid out of the cockpit, pulled off his helmet and goggles, and lighted a cigarette.

"No work for you today, Tompson," he drawled; "our friends, the jolly Germans are not taking the air this fine morning. It was just a joy ride this time."

"That's good, sir," grinned Peter. "By the way, sir, about Carlson—there's something funny about him, I think. He's no good as a mechanic. Sir, I'm suspicious of that man."

The Lieutenant looked cautiously around, lowered his voice.

"I am, too, Tompson," he murmured; "I've an idea he had something to do about those loose safety wires—and other things. I want you to watch him closely, especially at night, and let me know any suspicious actions you see. But keep quiet about it, you understand."

"Yes, sir," Peter answered, thrilled at the Lieutenant's mysterious manner. "I certainly will, Lieutenant."

THE weather was hot and dry. Peter slept poorly that night, dozing uneasily in the borderland between waking and sleeping. The sound of someone leaving the mechanic's quarters brought him up on his elbow and in the dim light shining through the open door of the orderly room he saw Hendry follow an orderly out of the building in the direction of headquarters.

Special orders, he decided. G.H.Q. must want an extra patrol tomorrow. He thought about Carlson. Queer fellow, he mused, there's something about him that don't ring true. He doesn't belong with this outfit. Wonder if I'd better get the Lieutenant to get him transferred?

Acting on a sudden impulse he slid from his cot, walked softly down the aisle to Carlson's bunk. Carlson was not there!

Slipping on his shoes, Peter left the building and went over to the hangar. The sentry was on the far side of the mess hall and he entered through the small side door as quietly as possible. Standing there in the darkness, Peter waited while minutes passed. Then suddenly, out of the blackness, a wrench clanged reverberatingly on the cement floor. Regardless of any noise he made, Peter felt along the wall, reached his work bench, yanking open a drawer, and found his flashlight. Snapping the button, he sent its brilliant rays over

WE'RE SORRY!

BECAUSE of circumstances beyond our control, the special photo feature we promised for this issue—The American Bombers Pass in Review—"conked" just as it was "taking off" for the printers. But we'll have it for you in the April number of FLYING ACES without fail.

—THE EDITORS.

and about the hangar. But there was no one there!

Going back to his quarters, he noted that Carlson was still absent. Peter decided to wait till morning to tell the mysterious occurrence to Lieutenant Barington. Carlson must have been the person in the hangar—and he was there for no good purpose. It was a queer business.

LONG before dawn Sergeant Hendry strode up and down the aisles in the mechanic's quarters, his deep voice bellowing, "Rise and shine, you greaseballs! Everybody out on the jump. Special full strength patrol. Every ship and pilot to fly!"

The field became a scene of feverish activity. Lights flashed up in every building and the busy mechanics tested and checked their ships in efficient haste. Soon the air was filled with the muffled thunder of idling motors as the ships were slowly warmed up on the starting line. Just as the trees on the far edge of the field became faintly visible through the grey dawn the entire personnel of pilots emerged from headquarters and scattered toward their ships, pulling on helmet and goggles and drawing on a last cigarette with nervous haste. Rumors flew about among the mechanics that some big movement of the Allied troops was going on behind the lines and that the Squadron had orders to attempt to keep all German planes out of the air on this sector so that no information of the movement could be secured by the enemy.

"Everything all right, Tompson?" asked Lieutenant Barington hurriedly.

"The ship's okay, Lieutenant," replied Peter. Then Tompson lowered his voice, "About Carlson, though. I think—"

"Can't stop for that now. Both gas tanks full? It's going to be a long patrol."

"She's good for over three hours, sir."

"Right. Pull the chocks."

One after another the ships drummed out a roll of thunder from their exhausts, bumped down the field, and climbed into the sky. The sun had not yet risen and the greyness, combined with the dense clouds of dust made thicker by each succeeding plane, soon caused the limits of the field to become dim and indistinct in the gloom.

Lieutenant Barington, acting as rear guard, was the last to take off. But almost before his tail came up and he

started rolling down the field, something seemed to be wrong. He cleared the edge of the field, but as he did so, there came the grating sound of ripping fabric. The Spad's motor sputtered and the ship fell off in a sickening side-slip. It disappeared behind the trees, and a dull thump followed.

In an instant, the trained emergency crews swung into action. Lurching and bumping across the dusty field, sirens screeching and wailing, the "crash wagon" and the ambulance raced together toward the tree-lined end of the field.

Peter, clinging to the rear step of the speeding "crash wagon," his mind filled with ghastly memories of other crashes, of still broken forms in a tangle of shattered wood and metal, of writhing, screaming figures glimpsed momentarily through orange curtains of roaring flames, could hardly believe his eyes as he reached the scene of the crash and saw the Lieutenant, unharmed save for an ugly cut over one eye, walking nervously about before the wreck of his Spad, smoking a cigarette.

"I sure did wash out that crate," he greeted them. "Couldn't see a thing on the take-off and I must have drifted too far over toward the east. First thing I knew a tree top reached up and pulled off the whole lower right wing. I cut the switch and the old bus went down like lead. Are there any other ships left in the hangars?"

"Only the captured German ship and the Salmson, that old two seater observation plane, sir."

The Lieutenant seemed unusually perturbed at the news.

"But I've got to—I should join the patrol. But that Salmson—it's too slow. Oh, well, I guess I stay on the ground."

Peter went back to the hangar to get some tools. The magnetos and some other parts could be salvaged from the wreck. And now he noticed that a group of mechanics had pushed the German ship, a Fokker which had been forced down by engine trouble, out of the hangar and were working on it, gassing it and covering its black crosses with white paint.

"Going to send it back to America as a trophy," one of the mechanics

confided to Peter. "A pilot's coming up from Brest today, the Sergeant says, and he's going to ferry it back to the harbor."

While Peter worked at salvaging the undamaged parts of the Spad he marveled at the Lieutenant's close escape from death and wondered why he seemed so worried because he was unable to join the patrol over the lines. Several times he thought he heard a faint, muffled call. Abruptly, he thought he heard it again. He threw down his tools, went to the brink of a little gully beyond the trees and just outside the field. Lying there, half hidden in the brush was Carlson, his head a welter of blood from several long and ugly wounds!

"Tompson, stop that patrol!" gasped Carlson as Peter raised him up to a sitting posture. "Get them back at once or they're doomed men! Acid on all the control cables down inside the fuselage where you mechanics wouldn't think to look. Those cables will be eaten through in two hours. Barington did it—he's a German!"

"B-Barington?" stammered Peter. "He can't be! Why, he—"

"Don't argue. There's no time to lose. I'm a Special Agent from Intelligence—been on his trail for weeks. I saw him pull those wires off your motor so as to throw suspicion on me. He's been getting wise to me lately, that's why he set you to following me so you'd keep him informed of my spying. I caught him in the hangar last night after you were there, caught him with the acid. He'll escape to Germany now that he's carried out his plan. When I surprised him he knocked me down, dragged me here—thought he killed me. Get that patrol back!"

SERGEANT HENDRY listened tensely when Peter brought him this startling story. "The patrol has got to land before they break their necks," Hendry snapped. "I think I can fly that old Salmson—I'll take it and warn them. Wait, I'll need a gunner to man the Vickers in the rear cockpit. Who'll come along?"

The ground crew shuffled their feet uneasily and looked away. It was suicide, Hendry had flown so few times

—why he'd never get down alive.

Although his heart throbbled in his throat and his knees shook with fright, Peter stepped manfully forward.

"I'll go, Sergeant," he said bravely; "I've handled a Vickers on the testing range."

Hendry's lips started to curl, but suddenly he laughed.

"Devil take it, Tompson," he roared, clapping Peter on the back with an enormous paw, "I knew you had nerve when you talked back to me in the bar-room the other night but now, you little runt, you've shown more guts than all these grease balls put together. Come along! Hey, you weak sisters, get that ship warmed up on the jump. Corporal Eldric, take a detail, find Barington, and put him under arrest. That baby's going to get a firing squad or I'm a Dutchman. Lord knows where he went after his crack-up—but you've got to find him!"

Peter climbed into the rear cockpit of the battered old observation ship, buckled the safety belt around his middle. Hendry opened the throttle, the motor bellowed, and the unwieldy Salmson waddled across the field, broke into a clumsy canter, and finally bounced up into the air like a rheumatic stork.

Peter gripped the sides of the cockpit firmly. Like most mechanics, he had ridden but few times in the machines upon which he had worked for so many long hours. His stomach rebelled at the repeated lurchings and swayings that the ship made under Hendry's inexperienced hand, and for an awful moment he thought he was going to disgrace himself by being sick. Hendry looked back triumphantly after he got the ship safely in the air and seeing Peter's white face, grinned encouragingly. Slowly the feeling of nausea passed and Peter began to look about him with interest.

Away down below were the narrow, ribbon-like roads and the zig-zag lines of the trenches. Peter drew a long breath of satisfaction. He was high in the air over the lines, bound on an important mission. This was adventure. It was not such a bad war after all!

Hendry pointed upward, headed the nose of the ship toward the sky. Away above them was the Squadron, patrol-

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ling back and forth along the allotted stretch of forty miles of front. Even with the motor laboring at full speed, it was many minutes before they could level off with the patrol.

Wagging his wings wildly for attention, Hendry singled out the leader and started crowding him away from the lines. Throttling back to slower speed and plainly bewildered, the leader waved them away.

Peter stared at the planes in agonized anxiety. Minute by minute the acid was eating through the control cables. At any second, one after another, those speedy, powerful ships might start fluttering and spinning down out of control, their pilots helpless to do ought but wait for the certain death sure to meet them.

With a muffled curse, Hendry kicked hard left rudder, headed straight at the leader. The startled pilot wrenched his ship out of the way, peered with white face over the side, and shook his fist at Hendry. Again the Sergeant made a threatening move to ram the Spad and at the same time pointed desperately back toward the flying field. The leader, finally convinced of the significance of the Salmson's wild maneuverings, slowly nodded his head and, followed by the entire patrol, pointed his ship's nose for the field.

The two men in the observation ship watched them disappear with mingled relief and anxiety. If their luck held out, they would be on the ground before the weakened controls gave way. Hendry swung the ship around for one

last look at the front before following them down.

SUDDENLY, away down below and headed straight for Germany, Peter saw a Fokker, its wings glistening with fresh white paint. Instantly, he knew who was in that ship. Barington, knowing that his game was up, had somehow stolen the captured German ship and escaped before the ground crew had a chance to stop him.

Peter leaned over, grasped Hendry by the shoulder. "Barington!" he shouted and saw the Sergeant's mouth tighten into a grim line as he comprehended. For both those men there was nothing but undying hate for this Hun who, instead of fighting man to man, chose instead to kill by underhanded methods.

The odds were against them, Hendry and Tompson knew. It was an old Salmson against a new attack Fokker—a stork against an eagle. But without hesitation Hendry pushed his ship over into a dive straight toward the fleeing German. He got in a wild burst with his synchronized machine gun, then pulled the Salmson up in a wobbly chandelle. Peter dragged his Vickers around on its little circular track, drew back on the trips. He saw, above his jumping ring sights, the tracer bullets tearing into the right wing tip of the Fokker.



Startled, Barington shoved his throttle wide open and zoomed. Coming out of a wing-over above them, he recognized the ship and its occupants and although, by reason of his faster ship he could easily have escaped, he chose instead to give battle to the men whom he knew had spoiled his plans.

He dived far beneath, zoomed up some distance ahead and, half rolling out, headed back toward the Americans, the red flashes of his guns winking evilly. Peter, now firing over the top wing, saw little round holes appear with magical swiftness in the center section of the Salmson. Two steel flying wires, severed by the stream of bullets, sprang back toward him like striking cobras. Hendry pulled the ship back into a crazy tight loop. Its motor roaring at full power, wings bowed from the strain, the Salmson shivered, but held together.

The Fokker swung left, turned, and came back again, heading straight toward the left side of the Salmson. Peter, his legs firmly braced and his face and shoulder pressed against the jumping machine gun stock, held back his trips, tried to find the oncoming ship in his sights. Bullets were hissing and snapping past his head. A sliver of wood and fabric splintered out from the wing, vanished over the side. Something hit Peter a terrific blow in the left shoulder and he was down on the floor of the cockpit.

It was hard to get up again. Somehow, he couldn't seem to move his left arm—it felt as though it were asleep. Something warm was running down inside his shirt, he must be bleeding badly. He had to get up; had to get that gun going again. He couldn't leave

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the Sergeant unprotected.

It was hard to hold the gun stock with only his right hand and shoulder—and he was getting so tired! Couldn't hold it much longer. Vaguely he heard again the whip of bullets about his head. Opening his eyes with an effort, he saw the Fokker headed toward them again in a screaming dive, Barington's aquiline face bent grimly behind his spewing machine gun.

With a last effort, Peter swung the gun up, squeezed the trips. He couldn't hold it steady, it was jumping and wobbling about in erratic circles, but all the while it kept up a ceaseless chatter. Then suddenly, incredibly, the German stopped firing. Hendry did a crazy turn and as they came out of it the Fokker went past them. There was Barington, leaning back against the cowling, his head nodding and swaying with the motion of the ship, while from a corner of his mouth a bright crimson trickle was spreading down over his jaw!

For a few seconds the Fokker flew on across the sky, the dead pilot's hand still on the controls, then it faltered, stalled, and snapped over into a tight spin. Down and down it fell, spinning faster and faster, until, away down on the distant earth, a puff of dust leaped into the air, a bright orange flare flick-

ered for a few seconds, then disappeared.

VAGUELY, as though from far away, Peter felt a series of jolting, crashing bumps and heard the rasping of the tail skid as it dragged over the ground. Then, somehow, he was lying on the ground and the sharp sting of iodine shot through his shoulder like hundreds of needles.

"A couple of nice little holes through his shoulder, but he'll pull through all right," he heard someone say.

He opened his eyes.

"We got that German spy sure enough, didn't we, Sergeant?" he asked faintly.

"We got him? You mean *you* got him," said Hendry fervently. "I thought my number was up sure when he knocked you down and left my tail unprotected, but you got him plenty with that last burst. Tompson, you may be a little runt but still you're the biggest little scrapper in this outfit."

Peter sighed faintly. He was awfully tired and it was hard to think, but he wanted to keep remembering that he sure had killed a German spy—that he had brought down a Hun ship and saved Sergeant Hendry's life. It was a good war!

On the Light Plane Tarmac

(Continued from page 27)

motorcycle industry a number of years ago. The motorcycle fan was not satisfied with a mount that would get him about the country at a normal rate of speed and with a minimum of noise. He wanted a heavier machine that would do 100 m.p.h. For a few years he had his way, then Mr. Ford invented his famous flivver and cluttered the roads up with four-wheeled vehicles and the motorcyclist got in the way, caused accidents, became a menace. The true motorcyclists finally gave up and took to the car.

Today, the motorcyclists and the manufacturers are seeing the error of their ways. Lighter and quieter bikes are being built. Those who use them now enjoy them for what they were originally intended for—pleasure. They have rallies and club runs, and they enjoy the roads and beauty of the country just as the true automobilist does.

As stated above, the American flying enthusiast did not want a light plane. He sniffed at it and said: "If I can't fly at 100 miles an hour, I'll stick to my car. I can get eighty out of that. Those European jobs only cruise at 65 and they have a motor that looks like a coffee grinder. That's not flying."

The American motorcyclist sniffed at the light European bikes, too, because they were only listed at 4 and 5 h.p. and did about 40. But look at the motorcyclists abroad today! They really enjoy the game. Their club runs and rallies have something of a social background.

But thank the Lord the 1936 Ameri-

can is beginning to see the light where sport plane flying is concerned. I can count at least twenty of my friends who would buy a light plane tomorrow, if there was one available for a reasonable price. And not one of them ever reads an item about flying, races, speed records, or cares who has the largest air service. They want to *fly*—to get into the air alone and get the benefit of the clean, unobstructed air lanes. They know that the day of motor-ing pleasure is over. Their car is just something in the way of necessary transport.

THE \$500 WRITE-OFF

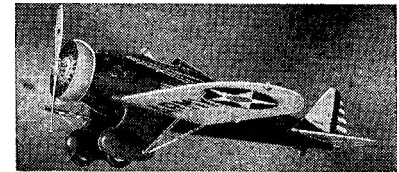
SO what? Why isn't there a real low-priced light plane in America? First, there is the opposition of the aeronautical manufacturers. They would like to sell a few thousand light planes next year, but they are actually afraid the purchasers will ruin aviation. There's too much money invested in commercial and military aviation ventures to risk the light plane game just yet. They picture the sky full of rattle-brained young men, bashing into one another, piling into cities and towns, and running up a death list that would put a World War casualty report to shame.

The Chamber of Commerce for Aeronautics has tried to prevent such a disaster with stringent rules concerning licenses and examinations of all craft. They are perfectly right, as they see the situation.

The automobile industry has seen the

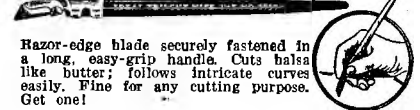
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Actual photo showing how CHARLES ATLAS looks TODAY

writing on the wall, too, and have put every block possible in the path of the light plane game. They have openly said that to finance and build light planes and suitable motors on a production basis is not possible. The reason is that so far, they have not really attempted to design a light plane motor that would pass government tests and stand up under normal private flying conditions. They have played around with revamped auto engines that develop about 80 h.p., whereas the true light plane would be perfectly efficient at about 35 or 40 h.p.

Let's look at the situation in this light: A great number of young men take out private licenses every year. They pay anything from \$350 to \$500 to put in about ten hours of solo to get this ticket. After that, what?

Also, there are numerous young men and women who take up gliding—an excellent sport, no matter how you look at it. But gliding, while it teaches much about actual flying, is just a teaser. They soon want to become power-plane pilots. Some actually put motorcycle engines on their soarers and hop off. The Department of Commerce frowns on such tricks—and rightly so. A soarer is one thing. To attempt to make this light craft into a powered machine is quite another.

Thus we see that several hundred enthusiastic young flying men and women reach a certain point in their training and after that, they have to pay a great sum to hire a plane to keep their hands in or they lose their tickets. Many give up in disgust and forget all about the \$500 they invested. They write it off as a loss.

This is plainly unfair, but they can do nothing about it. In England, however, a group puts up enough money to pay fifty per cent down on a plane. Then the Director of Civil Aviation writes out a check for the other fifty per cent, an instructor is selected from the R.A.F. list, and the members pay him so much an hour from the club funds which they themselves pay in at so much per hour of flight training or solo. Once a member is proficient enough to gain his "A" or private license, the government chips in again and pays half of the cost of training that man—or woman. This goes toward new equipment. Each "A" license, then, means more money for the club and the system goes on joyfully. No wonder they have so many clubs and people who can fly over there!

Unfortunately, this rule isn't being enjoyed here. But the flying club is the only way out for the private or sportsman pilot. Such a club, we learn from certain manufacturers in this country, can be established in sections where as few as twenty enthusiasts can get together and put in \$100 apiece. Most certainly, one cannot expect to learn to fly for any less than that.

THE CLUB BASIS

THERE are several plans for a successful flying club. Once you have organized your group and selected someone who is up on these matters, the important thing is to make sure

you have a flying field suitable for safe tuition work. The average large airport is not suitable, since traffic is usually heavy. Select one of the lower classification fields that has plenty of room and convenient approach facilities. The hangar conveniences are not so important, providing that your ship is suitably covered at night and protected from bad weather.

Next, select a *good* mechanic-pilot—not one of these helmet-and-goggle models who prances about on the tarmac in clean white breeches, gleaming boots, and gold wings. Your man should be a good all-around fellow with a transport license, one who can take care of the ship as well as give flying training. There are hundreds such good pilots available just now, but you had better act fast and get your pick.

And now the plane. Here you must consider your finances. If twenty members contribute an initial \$100 apiece, you have \$2,000 to start. There are a number of machines in the \$1,500 class that will provide you with all the training facilities you desire. There is the Flyabout made by the Aircraft Mechanics, Inc., of Colorado Springs, Col., which can be purchased for \$1,400. This ship is powered with the 37 h.p. Continental radial. The D-2 model comes with the Szekely 45 h.p. motor. Both are approved types. The Porterfield, a two place cabin ship with a 65 Velie comes at \$1,595. The Rearwin sportster comes nearer the \$2,000 mark, listing at \$1,995. Machines in the class of the Aeronca, the Monocoup and the light Fairchild all make ideal school ships for modern club training. The Taylor Cub is another nice job, and we'll describe other suitable ships in coming issues of **FLYING ACES**.

The cost of flying a new ship in the general class listed above must be considered, of course.

In student training, it has been figured out that a 40 h.p. motor costs 75c per hour for gasoline and oil. Depreciation runs to about \$1.10 an hour, maintenance 25c per hour, and hangar rental 40c per hour. Thus the total cost of \$2.50 an hour must be the basis of operations.

Let us then presume that the members, after paying for the ship, agree to pay into the club fund a sum of \$10.00 per hour for flying time. This is a generous fee but most useful for general figuring. If the member goes solo, he is charged \$7.00 per hour.

YOU CAN MAKE MONEY!

WE will now work on the basis of \$3.00 per flying hour for the instructor, although other and more inclusive arrangements may be made that will take in the maintenance mentioned above. If, over a period of one month, the members fly the ship a total of 45 hours, the income would be \$450 if all the time paid for was dual. It will be a little less if there is some solo. Subtract from this the sum of \$247.50—the expenses involved which includes the salary of the instructor and the \$2.50 per hour maintenance cost—and you have a profit of \$203.50 in the club

treasury. Thus, in one month, twenty members have been able to get a share of 45 hours of flight training, which, while it does not sound much, still stands at something over two hours each. And in two hours, you are getting well along toward your solo time. Actually, you see, each member has paid out about \$120 for that much time, but he also has an equity in a new plane and is still a member of an organization which has \$203.50 in the treasury toward a second. Or, if the members so wish, they can use the fund in such a

way that their instruction fees become less, as their hours pile up. Add to all this the club social activities, good fellowship, pride of ownership, ground training suitable for private ownership, and mechanical experience of a nature that fits in best with sportsman pilot training—and you've got plenty!

There's the light plane idea in a nutshell. If you have any further questions to ask, do not be afraid to write to us. Address, On the Light Plane Tarmac, FLYING ACES Magazine, and we'll do our best to put you straight.

Can Our A-A Guns Defend Us?

(Continued from page 10)

target is sighted through each of them. This gives us the simple trigonometric problem of a triangle. For the length of the base of the triangle—that is, the length of the tube on which the telescopes are mounted—is known. In addition, the angles of the telescopes to the tube are also known. The instrument, then, readily calculates the distance of the triangle's apex—which is the enemy—for by mathematics, the distance of a triangle's apex from its base is easily determined when the length of the base and the two base angles are given.

Operating on this principle, the data computer automatically indicates the distance and altitude of the target. The data computer also makes allowance for direction and velocity of the wind, muzzle velocity, and air density. As it will take the shell several seconds to reach the altitude of the airplane, a certain amount of lead must be allowed, and the computer automatically registers this.

While it sounds complicated in the telling, all of these computations are made *instantly* and the officer in command of the instrument, usually a lieutenant, at once begins to swing dials to aim the guns. One dial indicates the lateral position, or azimuth, of the gun. When the lieutenant sets his dial, say, at the number "3", a dial on each gun automatically moves to "3" and the gunner simply turns a knob to this number. Immediately, the gun swings around to the desired position. In a similar manner the gun is aimed vertically. Therefore, laying a modern A-A gun on a target is simplicity itself.

The piece is now ready to be fired. The fuse on the shell is set to burst after so many seconds, depending on the height of the target. The fuse consists of a sliding ring which moves around a fixed indicator. This movable ring is numbered, "1", "2", "3", and so on, representing the number of seconds before the shell will burst once it has left the gun.

BRIEFLY, this is the story of our formidable new weapons of defense against aerial attack. It should be readily apparent what vast progress has been made since the A-A guns of the World War. The personal error is eliminated, for the range data is automatically computed and is carried to the guns in a flash by electrical trans-

mission from the range-finding instrument. No sights are necessary on the guns, and they have an increased arc of elevation as well as increased muzzle velocity. Moreover—and this is important during operations in the field—they are much more mobile and can be set up and dismantled more rapidly than could Archie. Also, the recoil mechanism is considerably improved.

Of course, aircraft have made vast strides forward, too. During the War, no one ever heard of a bomber that could fly faster than a pursuit plane and do loops and other evolutions as well. But that is what A-A gunners have to contend with today. However, the automatic data computer has proved itself to be almost superhuman in keeping the guns trained on as elusive a target as a stunting airplane. Coast Artillerymen believe that they can unquestionably frustrate an aerial attack, provided, of course, that they have a sufficient number of batteries.

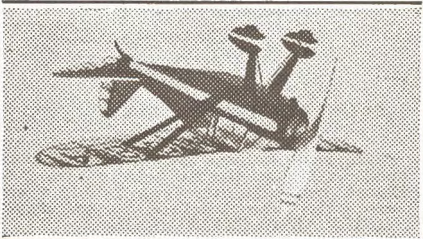
Even so, scientists are not satisfied with the almost perfect system now in use. New developments are constantly being made. At present there is being demonstrated to the United States Government a system for the radio detection of approaching aircraft. Our present day sound locaters are effective only within a range of 9 or 10 miles. A new system which projects a radio beam can, it is claimed, pick up the sound of aircraft 720 miles away. While present types of sound locaters depend upon the sense of hearing of the operators who focus them on the approaching enemy, the new radio detector turns automatically toward the source of the sound. Dials on the instrument show the exact distance of the aircraft and tell how many there are, the direction in which they are flying, and their speed and altitude. It is also claimed that this remarkable instrument can distinguish between friendly and hostile craft. The apparatus was developed in England, but it is now being offered to the U. S. War Department.

There is also being developed a larger and deadlier type of machine gun to use against attack planes flying too low for field piece fire. The new gun will fire a small, high explosive shell so sensitive that it will burst upon striking even a thin piece of paper.

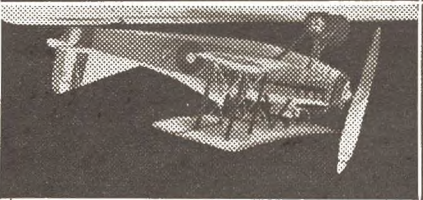
One interesting development is the projected use of electro-magnetic waves to put an aircraft's magneto out of

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Which Prize Will YOU Have First?

COMPLYING with the wishes of many of you readers, we have formed the **FLYING ACES PRIZE CLUB!** "Doug" Allen, your National Adjutant, is in charge and what a swell time we're all going to have! Just look over these prizes! Great, aren't they? You bet they are, and they're **YOURS ABSOLUTELY FREE!**

All you have to do to own them is send us a few subscriptions, and please bear in mind that these prizes are not given **WITH** subscriptions—they represent your "pay" for securing them. Moreover, to aid you in your work, "Doug" has induced certain publishers of other popular magazines to "club" with us, which means that you can sell a sub-

scription to **FLYING ACES**, together with one of these publications—a list of which will be sent you upon request—at a special low price for the two, with a substantial saving to the subscriber. Just think how easy it is going to be to secure subscriptions on this basis!

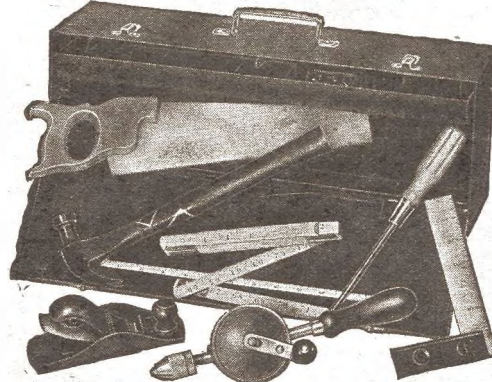
Fill out the coupon below **RIGHT NOW** and we will send you by return mail complete instructions, together with order blanks. Then you can get started at once. From all appearances the big subscription season, directly ahead, promises to be a good one and this means that you should be able to easily win any prize or prizes you set your mind on.



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(Given for 10 one year, or 5 two year subscriptions to **FLYING ACES**, alone, or in club with other magazines.)

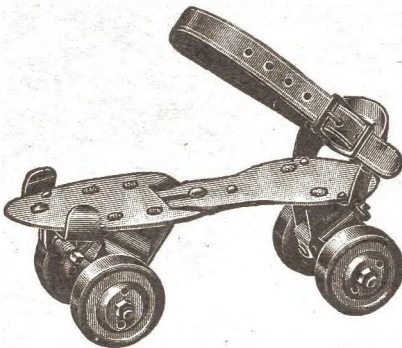
Here's the instrument you bike owners have been longing for! A genuine speedometer that not only tells how fast you go but records the trip mileage as well. Made by Stewart-Warner, one of the largest and oldest manufacturers of automobile speedometers in the world. Just like the one on Dad's car! **SPECIFY PRIZE NO. 1.**



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Any model builder, "armed" with the latest copy of **FLYING ACES** and a **STANLEY TOOL SET** is in a fine position to make prize-winning models. We're not going to enumerate the various tools because you can see many of them. **SPECIFY PRIZE NO. 2.**



CHAPIN-STEVENS ROLLER SKATES

(Given for 4 one year, or 2 two year subscriptions to **FLYING ACES**, alone, or in club with other magazines.)

Here we offer you one of the finest and strongest skates manufactured. They are ball-bearing type; high back construction making them suitable for either boys or girls; clamp toe and nickel plated. **SPECIFY PRIZE NO. 3.**



REGULATION SIZE FOOTBALL

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Before we realize it the football season will be with us, and what a lot of fun you fellows can have with this ball. It's really "built"—made of genuine "top-grain" leather, stoutly sewn and stitched; with pure gum bladder. A tough, heavy football; with rawhide lacing. You'll never kick this one flat! **SPECIFY PRIZE NO. 4.**



FINGER PRINT OUTFIT

(Given for 3 one year, or 2 two year subscriptions to **FLYING ACES**, alone, or in club with other publications.)

This prize is offered as a result of popular demand. During the past few months many F.A.C. members, engaged in "G-2" work, have written us concerning such an outfit. Now you may have one of the same type sets used by not alone many police officers, but by the Federal Authorities as well. **SPECIFY PRIZE NO. 5.**

order and thus force it down. Experiments have actually been conducted and motors stopped—but only at short distances. However, if powerful enough waves could be sent out, it is possible that a high flying machine might be brought down. But proper screening of the engines might curb the effect of such waves.

It is interesting to note that whenever a new and powerful means of offense is developed, a means of defense against it is quickly evolved. Thus the science of armament see-saws back and forth, and the relation between the two changes very little from year to year.

It is quickly granted that the Archie of War days was no defense against enemy aircraft. But in 1936 the answer to the question, can our A-A guns defend us? is—providing we have enough batteries and trained men—"Yes."

Make the "China Clipper"

(Continued from page 44)

reputation of the remaining, and more orthodox, equipment.

Flares are used to obtain a fixed point for surface reckonings at night. An ordinary chemist's flask filled with silver bronzing powder and fitted with vanes to guide its downward flight has been considered for this purpose in the day time. On impact, the glass breaks leaving a bright spot on the water visible for miles.

The Pratt and Whitney double row, aircooled, fourteen cylinder motors are each fitted with the automatic mixture control. The three bladed Hamilton steel propellers are variable-pitch airscrews and most likely will be fitted with the new constant-R.P.M. attachment. The operation of the last mentioned, as its name implies, holds the engines at a constant speed whether the plane be climbing, flying level, or diving. The variable pitch propellers will compensate for the particular flight condition.

This complex giant requires a crew of nine to handle its needs and to guide it on the wing. On the ground, when the ship is undergoing motor overhaul or adjustments, small retractable platforms fold outward from the leading edge of the wing to provide a firm footing for the mechanics.

Incidentally, the *China Clipper's* cabin is completely sound proofed. Tests show that the cabins of aircraft of this size and structure are quieter than the average pullman.

Pan American Airways and both the Sikorsky and Martin plants have shown the way. That the world will not be slow to climb on the band wagon is already evident. At the present optimistic moment, far-sighted men can see no limit to their field of operations. At the rate they are progressing, it would not be safe to prophesy the future, for any forecast may fall short of the forthcoming event.

If you think that the days of the pioneer are a thing of the past, you're wrong. The *China Clipper* will one day be as famous an antique as noted ves-

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sels of the past are today.

And now to build our model of the *China Clipper*:

BUILDING THE MODEL

SELLECT a perfect block of soft balsa and cut it down to the over-all sizes required by the hull (11 3/4 by 1 7/16" by 2"). With a soft pencil, mark the profile on the side of the block. Remove the excess wood with a sharp knife. Smooth the newly cut surface. The sides are cut to shape in the same manner. Round the edges with a razor until the shape of the hull at the various stations agrees with the cross sections given. Templates are provided for the purpose. Mark the side elevation of the "V" bottom on both sides of the semi-finished unit. Mark the center line of the hull on its lower surface. Shape the bottom as required. Use a razor to form the edges at the two steps. A fine comb is suggested to form the corrugations shown after the sanding is finished.

WINGS, MOTORS, SPONSONS

THE wings are made in three pieces: center section, left panel, and right panel. Mark the outlines of the three sections on blocks of the proper thickness and cut out with a scroll or coping saw. Smooth the rough cut edges. Taper the thickness of the parts as seen on the front views. The wings are shaped to the camber designated. The necessary sections are given on the plan. Trim the surplus wood with a razor blade and sand the completed sections. The inner edges of the outer panels must be beveled due to the dihedral angle. Bamboo pegs as well as cement are used to assemble the three sections.

The cowlings are shaped round as required. The nacelles are first squared to their outside dimensions for accuracy. Shave the corners and sand with fine paper. Cut an incision in their rear faces to fit the leading edge of the wing. Attach the cowlings to the nacelles and the finished units to the wing. Use heavy cement for gluing and fill the crevices with it. Realistic propellers can be cut from tin. Attach them loosely with a pin.

The sponsons should be squared to the outside dimensions before any shaping is done.

Mark the pattern on the upper surface and trim. Taper them as seen on the front view. The cross section is given at one point. Their general cross section is an airfoil. Sand neatly and corrugate the lower surfaces as shown. Glue the finished sponsons to the sides of the hull at the positions noted. Use wood filler for the fillets if possible. Thickened cement will serve as a substitute.

TAIL SURFACES

MARK the outlines of the vertical tail on a sheet of the required thickness. Trim with a razor and smooth. Shape the front to the taper shown on Plan 3. The stabilizer is constructed in like manner. The finished surfaces are finely sanded.

ASSEMBLING

COAT the hull, wings, and tail with clear varnish or lacquer. Lacquer is quick drying. Clear dope will serve the purpose but not to the same advantage. Sand the surfaces with the exception of the corrugated portions with the finest sand paper obtainable. Wet-dry sandpaper is recommended and is obtainable at any hardware store. Give the units a second coat to completely fill the pores.

Hold the wing in position to check the alignment. If true, cement the wing firmly to the hull, filling small crevices with thickened cement. If through some inaccuracy in your workmanship the fit leaves relatively large crevices, use wood filler for the purpose. Streamline the struts shown and attach them. Be sure that they are in line when viewed from the front. Glue the fin and rudder to the hull. To it, fasten the two stabilizer halves. Leave the thread bracing off until the painting is finished.

The under side of the hull is black. The portion of the upper surface of the wing bounded by the color lines shown on the plan is red. The remainder of the ship is silver. The outlines of the controls, tabs, windows, etc. are trimmed in black. A realistic note is struck if the interior of the windows are painted white. The lettering NC-14716 is done in large black letters on the right upper surface and the lower left surface of the wing.

Rumania's I.A.R. 14 Pursuit

(Continued from page 48)

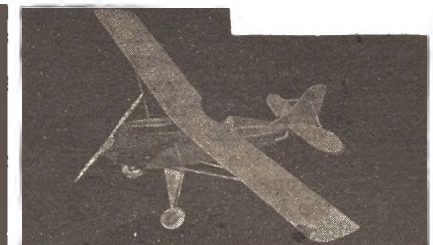
holds the rear rubber hook is cut from hard 1/8" sheet balsa and cemented well in position. The hook is installed in it first, however, before cementing the block in. It is a good idea to sand the finished fuselage lightly to remove any cement bumps, etc., which may have accumulated during construction of the ship.

WING

NOW construct the wing stubs. This part is built in one unit and cemented well to fuselage before fuselage is covered. The short leading and trailing edges are of the same stock as used in the wing proper—namely, 1/32" sheet balsa for trailing edge, and 1/8"

by 5/16" for leading edge, and carved to shape after being cemented in position. Be sure the spars in the wing stub section are of very hard balsa, cut from 1/16" sheet balsa. Don't forget the extra pieces of 1/16" thick hard balsa for landing gear members. Now to proceed with the wings. Only the right wing is shown in plans, but this may be easily copied for building the left wing. Begin by cutting out the ribs from 1/32" sheet balsa of medium hardness. Remember to make two of each rib shown in plans. To build the wing, use the following procedure:

Lay down the bottom wing spars, which are hard balsa. Also cut trailing



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edge from 1/32" hard sheet balsa, and pin down with the spars. The aileron spars are also put in place, as they are made at the same time. Some of the builders may be a trifle puzzled as to how to obtain the dihedral, which is built in with the wing. This is accomplished through the angle of the wing ribs to the bottom of the wing. When cementing the ribs in place, which is the next step, make a small template out of sheet balsa to place against each rib as it is cemented in, which gives them all the same angle. The angle is just past 90 degrees, which makes an acute angle between the ribs and the bottom of the wing. Now select a piece of hard balsa (1/8" by 5/16") for the leading edge. Taper it, as shown in front view of wing, and cement to ribs. Sand it to proper cross-section later. The ailerons are fastened in before wing is covered with two lengths of iron or copper wire which serves as hinges. Now bend the aluminum wire tip to shape and cement on end of wing as shown. Finally, install the three tip braces, cutting them to contour shown on front view of wing tip.

TAIL SURFACES

THE stabilizer comes next. The ribs are 1/32" hard sheet balsa. The leading edge is 1/32" by 1/8" hard balsa also. The stabilizer spar is 3/32" by 5/32" hard stock, while the elevator spar is 1/16" by 5/32" stock of the same variety. The same size aluminum wire is used on all the tail surfaces

as on the wing-tips. Remember to secure elevators and stabilizer together with the hinges before covering. The rudder and fin are practically self-explanatory, being of the same general construction as the stabilizer and elevators. The ribs are cut from 1/32" sheet, except where specified, where they are 1/16" for necessary strength. Fin and rudder spars are 1/16" by 5/32" hard stock. Again let me remind you to join the fin and rudder together before covering.

LANDING GEAR

SELECT only hard balsa for the landing gear, as it will naturally get more rough usage than any other part of the ship. All struts are streamlined as shown in drawings. The front, side struts are made from 1/8" by 3/8" balsa, the rear, side struts being 1/8" by 1/4" balsa, and the center struts are of 1/8" by 1/4" stock also. To reproduce the curve shown on the center struts (see front view of landing gear), cut out "V's" in the curved part and bend to shape, holding them with a heavy coat of cement. Notice how the widest strut is carved down to smaller size near wheel. Cut two "V" shaped pieces from balsa to fill up the two corners formed by the side struts where they meet (see side view of landing gear). The piano wire axles are secured to the center struts underneath, on convex side of strut curve. The ends of the axles on struts are bent in a rather long "U" shape to prevent their working loose and turning back

and forth. Install them flush with the struts and cement and wrap with fine silk thread. The wheels are 1 3/8" diameter and 1/4" wide. These may be purchased at any model supply house or made on a lathe from balsa. The writer purchased celluloid wheels and found them much more satisfactory as far as lightness is concerned. Now cement the landing gear unit to the wing stubs, using plenty of cement at joints. It is assumed you have previously cemented wing stubs in position as directed.

PROPELLER

THE flying propeller is made from a hard balsa block, size 1/2" by 1/4" by 6". Lay out propeller blank first, getting correct curve of spinner and inner blade curves. Do not cut the tips to shape until after carving. The rear section of the spinner is carved out of the same piece, and the finishing-off cap is made and cemented on later after shaft is secured in rear section of spinner. The scale prop is also shown, to be used for exhibition work. To make this, it is much easier to turn the spinner on a lathe, and after making each blade separately, insert them in holes 1/8" deep and make sure they are in line and at about 15 degrees pitch. A brass washer is securely cemented against the nose plug and prop spinners to serve as bearings. Two or three washers are inserted between the spinner and nose plug. The nose plug is made in two parts—the front consist-

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ing of a 1/8" hard sheet balsa disc carved to proper profile of the fuselage. The rear piece is cemented to this, and is 1/2" in diameter and 1/4" long, to fit hole in nose block. The plug is then drilled for the shaft, as was the spinner. Finally, the plug and propeller are connected on the shaft as a unit.

COVERING AND ASSEMBLY

MINO paper is suggested for covering the model. The fuselage is easy to cover well if you take your time and don't rush it. It is advised to cover the solid balsa pieces of the fuselage as well, as a much finer finish when painted will result. The wing stubs may be covered next. After this is done, use some more cornstarch paste for the wing fillets (see front view of fuselage). After they are completed, cover them with tissue also, using small pieces. In covering the tail surfaces, be sure the paper is secured down on all corners of the channels formed by the movable controls, to insure neatness. Each wing is covered separately and connected to stubs later.

Now connect each wing panel to its base, using plenty of cement on the butt joint. After this is dry, take strips of tissue to cover over the joint. All that remains to be put together now are the tail surfaces. The stabilizer is first cemented in place. Next the fin is cemented in place on top of the stabilizer. At this point make the bamboo struts supporting the stabilizer, and cement in position. The assembly is now completed by rigging up the fin brace of heavy black thread.

COLORING

THE general color scheme is khaki (equivalent to our olive drab) and silver. Use a good grade of colored dopes. The olive drab parts are as fol-

lows: Fuselage, top of wing, top of stabilizer, spinner, radiator, stabilizer struts, and section of rudder not covered by rudder stripes. Silver parts are as follows: Bottom of wing, bottom of stabilizer, landing gear, wheel centers, windshield frame, and prop blades.

Color the following details black: Front piece of headrest, tail skid, tires, section shown on side view of fuselage—each side (just under side cylinder blocks), starter crank holes in nose block, the figure "4" on sides of fuselage (see drawings), and the Venturi tube. The three colors needed for the Rumanian Insignia are blue, yellow, and red. Size and location of wing cocardes is indicated on plans. Paint one on underside of each wing in same position shown in top view of wing. The centers are blue, yellow in the middle, and red on the outer edge. Now paint the rudder stripes on. Blue is next to fin, yellow in middle, and red on outside. After this is dry, letter the data shown on rudder drawing with India ink and pen. Incidentally, in painting the wings and stabilizer with the olive drab and silver, be sure to have the dividing lines of color on the center of the leading edge, which is done by merely drawing a line with pencil along center of leading edge of wing. Have the dividing line of olive drab and silver on the line.

FLYING

THE original model required 3/8 ounce of nose weight, cemented in bottom of nose block inside to balance it for flying. In preparing it for flights, first obtain a good glide by experimenting a trifle with the nose weight. A field covered with tall grass is best for flying the ship. Power the model with six to eight strands of 1/8" flat rubber.

Flying Aces Club News

(Continued from page 33)

what special features our members like or dislike need not wait until publication of the next issue. Here's a letter from L. J. Murray, London, England. Friend Murray imparts a rather unique plan which might well be adopted by F.A.C.'s residing in sparsely settled sections of our own country. He says that his unit boasts members distributed all over England and Ireland, and that they meet twice a year in good old Dublin. And here's an answer to your question. I'll read it, in part: 'At our last meeting we discussed FLYING ACES from all angles and could not find any complaints. However, we have one suggestion and that is that the war planes album should be discontinued, since nearly all the ships have been shown. Why not substitute same with pictures of ships of the period from 1919 to 1930?' Well, anyway, there's one reply before you start.' (Editor's Note: We've already changed to modern aircraft in that department.)

"Boy, are they piling in!" remarks Doug. "Letters? I'll say they are," replies Herb, enjoying his fourth cup of coffee.

"Yes, letters, of course, but I really had reference to our ever-growing roster of honorary members. Here are two more in a row. The first is in the form of a card addressed to Col. Paul R. Guerrero, by Miss Laura Ingalls, who up and smashed Amelia's trans-continental record, and the second is contained in a letter from Eddie Petner, from way down in Columbia, S. C., enclosing acceptance on the part of the Governor of his State—Olin D. Johnston. At this rate we'll pretty soon run out of States."

"Say, Doug," remarks Herb, "that reminds

me of what the Governor of North Carolina said to the Governor of South Carolina."

"What did he say?"

"He said it's a long time between drinks—let's have another cup of coffee!"

Rising from his chair as if to make a speech, Doug says in all seriousness, "Fellows, I have a very warm spot in my heart for the writer of this letter. I refer to Gary Cameron from the land of Kangaroos and Eucalyptus trees. Recently, the F.A.C. unit in Australia, under the brilliant leadership of Gary, celebrated its first anniversary, at Sydney. A year ago they unfurled the F.A.C. banner out there on that huge 'island' between the Pacific and Indian oceans, and today they have over seventy members."

Whereupon, Editor Herb arises from his chair. "Mr. Chairman," he says, "I suggest we drink a toast to Australia, thereby giving me an excuse for drinking another cup of that good coffee."

After the coffee Arch speaks up: "Do you birds realize we're marooned here? Joe Archibald drove us over this morning and then went back to the office, thinking we'd take the trans-



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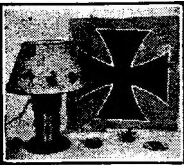
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over the fuselage saying, "Joe says he will come and get us if Herb will promise to publish his 'Phineas' stories just as long as he keeps writin' 'em!" Whereupon Herb leaps into the ship and shouts into the "mike," "Act your age, Joe—if we'd ever cut 'Phineas' out we'd have a delegation of protesting readers completely blocking Times Square!"

—DOUGLAS ALLEN.

Fly the Howard Hughes Racer

(Continued from page 36)

and sand the leading and trailing edges, and fillets to the proper streamline shape before covering with white tissue.

ASSEMBLY

BEFORE assembling, the center section wing assembly should be given a coat of banana liquid and fine sanded to kill the fuzz. The control wire from the nose should be attached to the crank, a washer cemented on to hold it on the crank, and a .4 oz. lead weight cemented in back of the 1/4" disc just before cementing the center section-wing assembly to the fuselage. Mix a creamy paste of flour and banana liquid and rub it on the balsa surfaces with the finger tips to fill the grain and scratches, using acetone or thinner to "grease" a spot if it becomes too sticky before finished. Sand all this with very fine sandpaper when dry and then cement the tail surfaces on. To stretch the tissue, dampen with water spray and let dry.

PROPELLER

THE propeller for flying is only slightly larger than scale, due to the speed demanded. Carve it from a very hard block. Cut out the propeller blank, varying its width as shown. After carving the blades, round up the hub and housing. The shaft is 1/32" music wire, attached in the conventional way. The nose block is removable for installation and winding of rubber. The original model is powered with 14 strands of 1/8" black lubricated rubber. To insert the power, enclose the strands in the special rear hook and bind the strands together. Drop this end into the

fuselage (while holding the other end with one hand and the nose of the model up with the other) and watch through the cockpit while engaging the hook to the anchor. Now enclose the front ends of the strands in the prop shaft lock hook. You will now notice that the end of the control wire looping over the prop shaft is removable and bent in such a way as to snap on and off when desired, and that the spring can be screwed onto the shaft by its coil, between washers.

DECORATING AND FLYING

THE real ship is mainly aluminum finished, except the wings, which are dark blue. The lettering on the tail, wheels, and motor is black. Lettering on wings and propeller is aluminum or white. Flaps on landing gear are brassy. A regular model gloss dope will give the best finish with one coat, if the surfaces have been filled carefully. *Do not paint the model, if you expect it to fly well.*

It is the best to flight-test the model in a field of tall grass, gradually increasing the number of turns from 75, after the first trial, to capacity, after adjusting until the model will fly horizontally for 75 feet before zooming. Adjustment of the torque control on individual models is necessary to prevent under or over control on the take-off. Good luck!

List of materials: Balsa, 2 blocks 2 3/4" x 3" x 20 1/4" for fuselage; 1 block 1 1/2" x 6 1/4" x 4 1/8" (grain the 4 1/8" way) for center section; 1 block 1 3/8" sq. x 4", hard, for wheels, noseplug; 1 block 1" sq. x 9", hard, for prop; 1 block 1/4" thick x 2" sq. for disc in cowl; 8 sheets 1/16" x 3" x 18" or 12 sheets 1/16" x 2" x 18" for ribs, covering wings; 1 sheet 1/16" x 2" x 18" for formers, tail outlines; 1 sheet 1/32" x 2" x 6" for short ribs, tail ribs; 2 strips 1/16" sq. x 12", for spars; 1 strip 1/8" x 1/4" x 18", for aileron spars.

Miscellaneous: 1 sheet thin aluminum 1 1/2" x 3" windshield frames, hinges; 1 sheet model celluloid 1 1/2" x 3" windshield; 1" 3/32" brass tube for noseplug bearing; 1 ft. 3/32" alum. tube, for scale landing gear; 2 ft. 1/32" music wire, for hook, shaft, landing gear; 2 ft. No. 14 music wire, for torque control, rear anchor; 2" No. 8 music wire, for torque control spring; 1 doz. 1/8" washers; 1/2 pt. banana liquid, for treating wood parts; 1 oz. flour, to make filler; 1 1/2 oz. model airplane cement; 3 oz. aluminum gloss dope; 1 oz. dark blue gloss dope; 1 dram black lacquer.

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on page 88 of this issue

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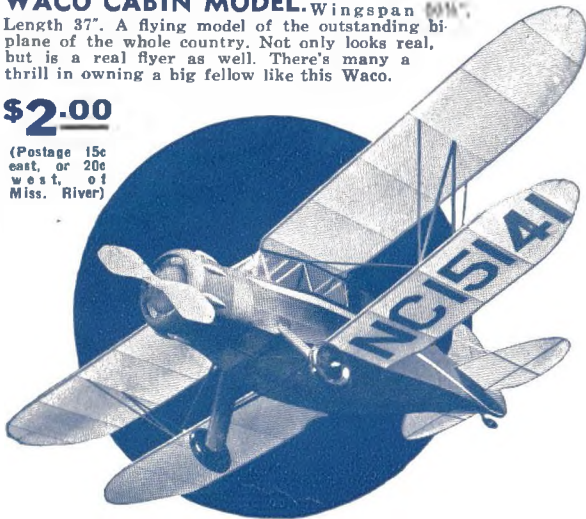
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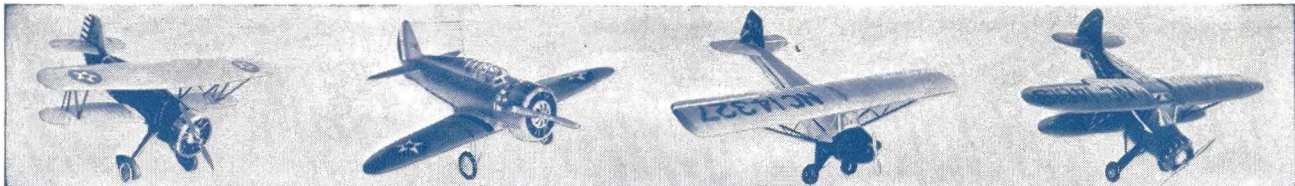
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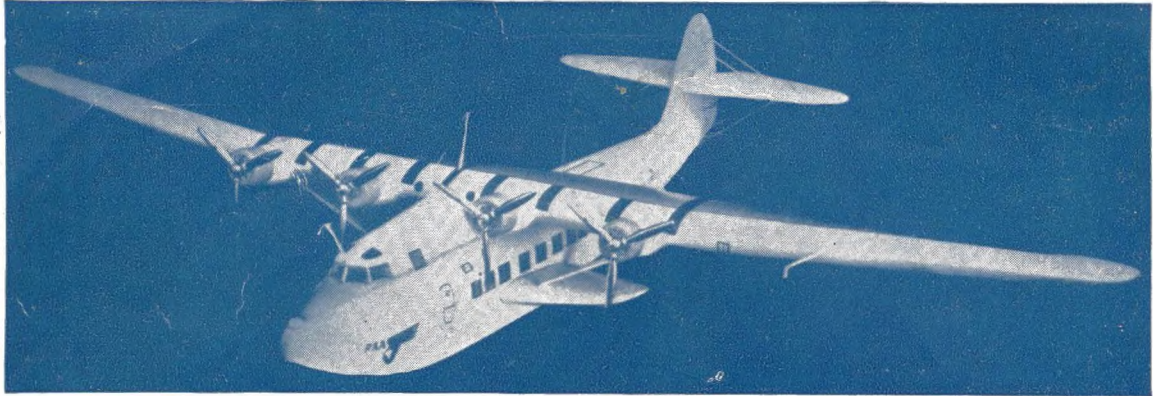
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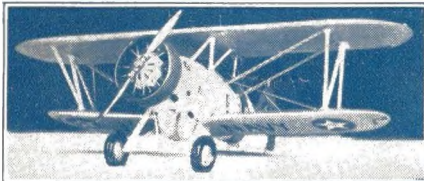
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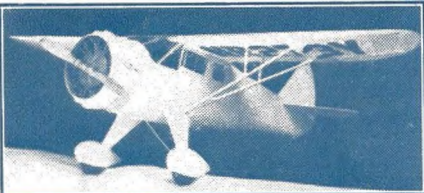
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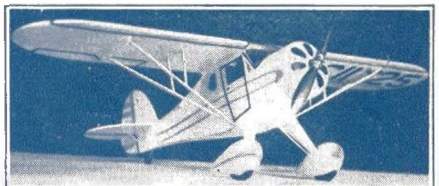
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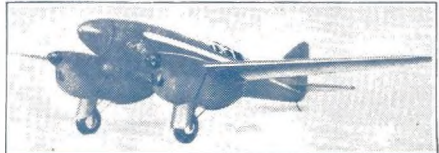
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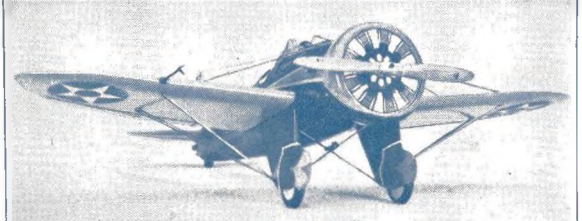
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