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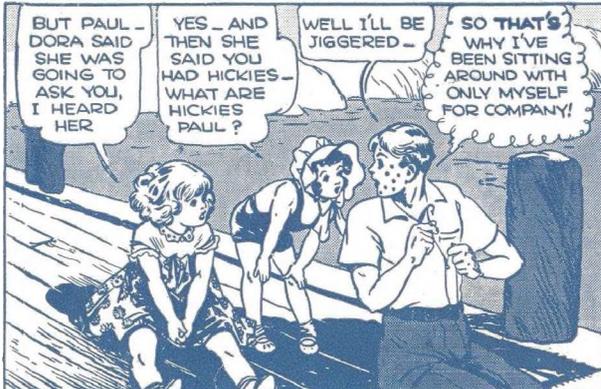
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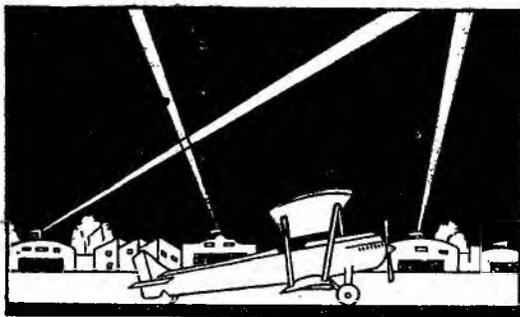
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FLYING ACES

A. A. WYN, Editor

HERB POWELL, Managing Editor

VOLUME XXIV

SEPTEMBER, 1936

NUMBER 2

EVERY STORY COMPLETE—NO SERIALS

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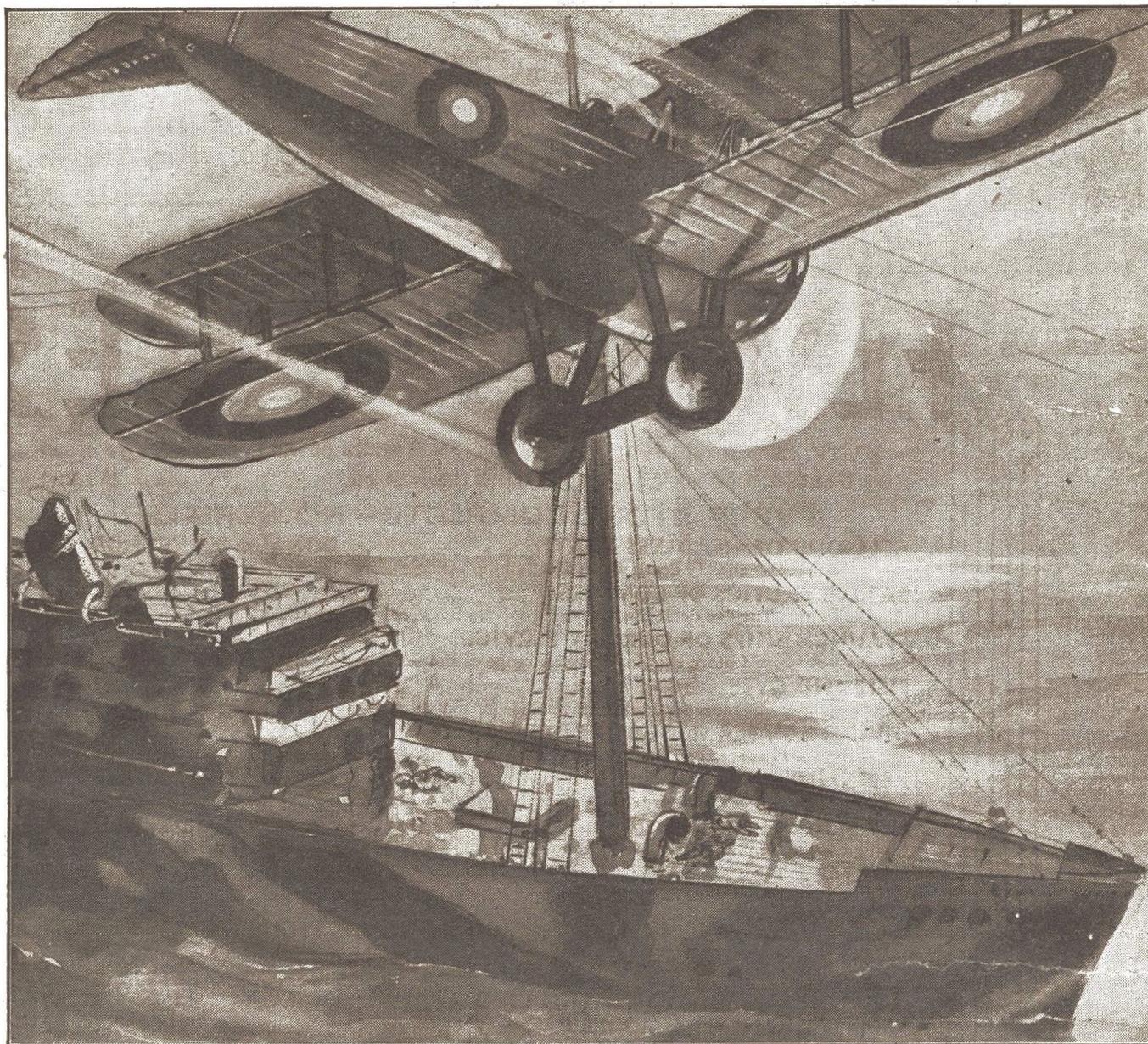
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Hellions of Headless Death

By Donald E. Keyhoe

Author of "Drome of the Bat Staffel," "Squadron From the Grave," etc.

CHAPTER I

SHIP OF DEATH

WITH a puzzled look on his face, Captain Philip Strange stared down through the mists. There was obviously something wrong with the vessel wallowing there in the sea, a thousand feet below him. It appeared to be abandoned—and yet it was not sinking.

He hesitated, recalling Colonel Jordan's imperative message to return post-haste from London. Then he eased the roaring Hispano and banked the Spad in a spiral. Something about that desolate vessel demanded investigation. He could tell from the way it rolled that no hand held the wheel.

But for the low ceiling, he would not have noticed it at all. Even now, in the gray and misty dawn, he could see very little. He leaned out of the cockpit as

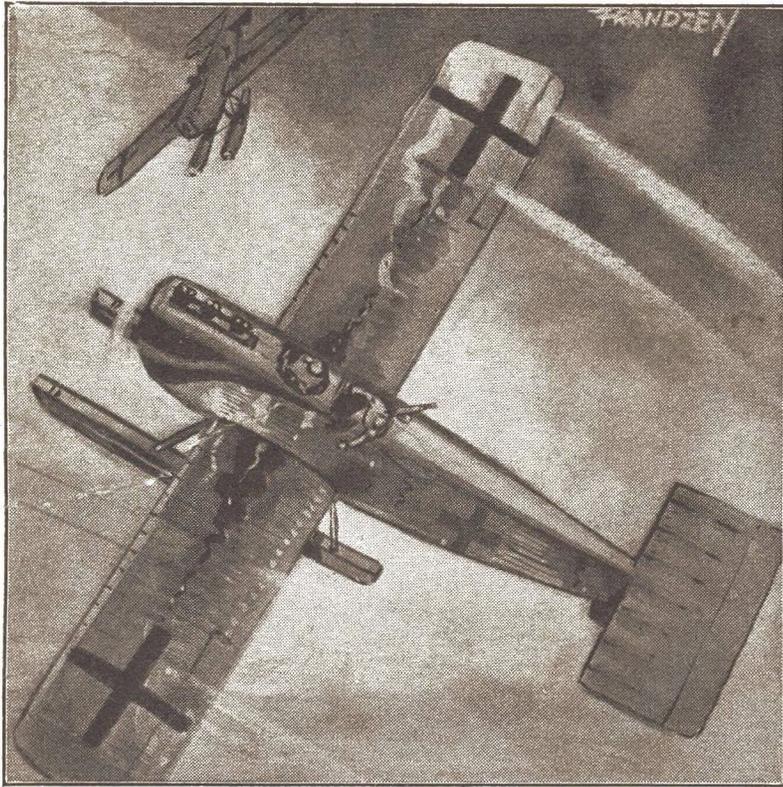
the Spad droned lower. The ship appeared to be a Channel boat, one of the smaller type used for transporting soldiers to and from France. But what was it about those funnels? Were they curiously camouflaged?

Then, with a start, he realized that the funnels had been blown to bits! Black, yawning holes showed where they had been. Pieces of debris were scattered around

"Good Lord!" Strange said in a stunned voice.

What he had thought bits of wreckage were mutilated bodies! At least a score of corpses littered the decks of the vessel. And with a sudden, icy horror he saw that every one was headless!

The gruesome sight for a minute deadened his senses. He banked around the floating charnel-house, fighting back the sickness which threatened him. The thing was incredible—like some horrible nightmare from which he must soon awaken. A headless corpse rolled in the



Illustrated by Eugene M. Frandzen

Philip Strange tensed. Then into that pocket of death he roared, menaced by the main-mast of that corpse-laden vessel, threatened by the flaming lead of the Brandenburg. His Vickers spoke, and the Boche observer crumpled, slid down into his pit.

lee scuppers as the Spad thundered by. There was a queer, dark spot on the deck beyond it.

With a tremendous effort, the G-2 ace drove back his revulsion. Those poor devils were dead—horribly dead. Nothing under Heaven could change that now. But if he could find some clue to how they had died, he might save others from that same frightful fate. He circled the vessel again. There was not a living soul in sight. What lay below the decks he could only conjecture. He eased the Spad closer, trying to see down through the jagged holes where the funnels had been. There was no smoke from the boilers. If he could glimpse—

T-T-T-T-T-T-T-T-T! A vicious pounding came to his ears—the hard, quick pound of a Spandau! Throttle and stick moved like lightning under his hasty touch. A streak of tracer bullets shot through his left wingtip as he whirled up in a chandelle.

The Spad roared up and about. Two darting shapes flung after it, and Strange caught the sleek outlines of two Brandenburg seaplanes. They had approached against the wind, without a sound to warn him—even the first burst of shots. He kicked over sharply, hauled back the charging-handle of his right-hand Vickers gun. Two criss-crossed bursts from the German observers' guns ripped through his lower left panel. He backsticked, came around in a furious half-roll. The main-mast of the death-ship was almost in his path. He plunged past it with only inches to spare.

Now both his guns had been charged. He reversed, stabbed a fiery blast at the nearest German plane. The pilot had skidded away from the wallowing British vessel. Strange drilled a burst through the tail before the observer could swing his Parabellum. Frantically, the pilot zoomed. Strange swept the stick back, but the other plane was upon him before he could follow through.

Fabric flew from the Spad's right wing. Strange flung into a vertical turn, raced around the corpse-laden vessel.

From out of the heavens came a ghastly death. Across the fields of France it lashed, and in the wake of that scourge lay strewn the grotesque corpses of decapitated men. None in the path of that frightful swath had survived—none save a wretched French peasant. It was this slim clue that led Philip Strange, G-2 Ace, to a startling discovery: Masses of Germans likewise lay slaughtered—by that same gruesome death!

The plane which had zoomed came plummeting down, its fixed nose gun blazing. The other Brandenburg plunged around on the tail of the Spad. Strange shot a swift glance to the right. There was enough space—but if he missed it meant a head-on crash with one of the two masts.

Stick and rudder moved with machine-like precision. The Spad screeched out of its tail-chasing circle. The masts seemed to leap out . . . and the Spad was through and clear.

Through—and up! Before the baffled Germans had time to reverse, Strange was above them and diving. A terrified observer clawed his way up from the cockpit where a sudden turn had thrown him. Strange crouched behind his sights as the Parabellum whirled. Flame stabbed from the German gun as his thumb clamped the trips together.

One swift burst—straight and true! Drilled through the chest, the Boche crumpled, slid down into his pit. The pilot twisted around, a murderous look on his face. For a second, the hand of the G-2 ace slacked its hold on the trips.

For the man before him was one he had thought dead—Baron Wolf von Munster, the bloodiest Hun on the Front, with his venomous Red Skull Staffel.

This man had disappeared three months ago, was said to have died in a crash. But that grim, savage face staring back at him was the face of Wolf von Munster.

Only that second, did Strange's hand relax its pull on the trips. But even in that moment, with the G-2 ace's guns trained upon his back, von Munster kept his wits. His two hands shot into the air—and with a violent swerve the Brandenburg rolled out of range.

Strange swore through gritted teeth. He had heard of that trick—and had fallen into the trap like the veriest novice. The baron had learned that a booted foot could kick a stick to one side as well as jab at a rudder.

The second seaplane was rocketing in from the left. Strange chandelled, tried to dart under the seaplane's blind spot. But the pilot was too swift. The Brandenburg twisted off in a hasty bank, and the observer's gun flamed back at the Spad.

Tracers crackled past Strange's head. He kicked away, ducked low in the pit. The compass shattered under a lash of Spandau slugs, and a shower of alcohol and splintered glass came down on his helmeted head. For

a moment, the fumes almost choked him.

Von Munster's plane came racing down-wind, nose-gun spitting fiercely. Strange feinted a right turn, swung back to the left with a furious boot at the rudder. Stick hard against his chest, he hauled the Spad around on its wingtips. The pontoons of the other Brandenburg flashed before his guns. He squeezed the trips, and the twin Vickers hammered eagerly. The German pilot suddenly rose in his pit, a grotesque, buffeted figure as that torrent of lead crashed through him. Strange saw the horror which shot into the rear man's face.

As the pilot fell, the observer dropped the rear-gun and frenziedly hurled himself forward. He had almost reached the stick when the dead man lolled down and struck against it. With a clean, sharp dive, the Brandenburg pitched toward the sea.

Von Munster had whirled furiously in an effort to save the other Germans. As the pilotless ship plunged into the water, the baron came about in a whirlwind turn. With renewed rage, he darted in at the Spad. Strange rolled with him in the turn, tightened his bank. The tail of the seaplane crept into his sights. He squeezed the trips, saw fabric fly from the Brandenburg's tail. Von Munster zoomed in a hasty Immelmann. Strange followed through, ripping short bursts from his guns.

The bullet-tracks were beginning to creep closer to the Boche at the seaplane's stick. Von Munster suddenly nosed down, dived into the mists and abandoned the fight. The G-2 ace made a brief attempt to follow, but the seaplane had been swallowed up in the murk. He waited, circling warily, until five minutes had passed, but there was no sign of the Red Skull Staffel leader.

Still watching carefully, so that von Munster could not surprise him a second time, Strange returned for a closer inspection of the death vessel. With his wings almost scraping the rails, he flew around the ship. At this close range, the scene was even more horrible and puzzling than it had been at first.

Not only were the dead men headless, but in at least half the cases their hands were gone. Some of the men's arms had been blown off above the elbows. But, oddly, there seemed to be no blood at all, only some curious, dark-blue spots on the deck where the dead men had fallen.

With a final scrutiny, Strange climbed away from that grim and desolate scene. The Channel patrol would soon find the vessel, and perhaps they would discover some clue to the horror. But he was sure there was no man living aboard that derelict to give the answer.

For the first few minutes he flew on mechanically, his mind on the weird problem. He stared thoughtfully over the cowl.

IT was puzzling, to find von Munster out over the North Sea, after these months of obvious hiding. He and the other Germans had come to see that corpse-laden ship, of course. But how much did they know of that horror? Their curiosity had seemed to be as great as his own.

Quickly, Strange went over what he remembered of the arrogant baron. An officer of the Imperial Navy, he had transferred to the German army flying services after the Kaiser's fleet had been bottled up. His driving ferocity had carried him to the position of ninth ranking ace, and he had gathered about him the fiercest men

he could find, creating the bloody and dreaded Red Skull *Jagdstaffel*.

Then Wolf von Munster had vanished, leaving a rumor of his death. But there had been other rumors. For the Red Skull 'Staffel had gradually become less active, and more than one Allied agent had reported that the pilots were being withdrawn for some other mission, and substitutes put in their places. Two of Strange's G-2 pilots—Jack Conway and Bill Brooks—had gone into Germany to work on the problem. Neither had returned.

Strange was still frowning over the problem when he reached the French coast at Griz Nez. Flying low, he headed southeast toward the meeting-place Colonel Ira Jordan had specified in his code message. A steady drizzle was falling over France. The Spad roared above Marquise, hurtled on over British-held territory. A tail-wind had speeded him from London, and it gradually increased as he neared the American sectors. He made a swift estimate of his fuel supply. He could just make it to the Fifth Wing field at Vaulecourt. He climbed a little higher in the mist, to be able to stretch his glide if necessary.

The hands of the dash-clock showed almost seven when he nosed down, engine half-throttled. The terrain took familiar, though hazy shape below, and he saw he was almost on his course. He turned, glided over the Meuse River, watching for the Vaulecourt-Grancy road. Suddenly he noted an unusual activity beyond the eastern bank of the river. He dipped lower. A huge column of ambulances was moving along the road. In a minute, as the Spad raced above the slow-moving vehicles, he saw a score of huge tents in a meadow close to Grancy. The tents bore large red crosses, and through the drizzle he could see files of men with stretchers.

He was reaching for his field-glasses when the Hispano sputtered and began to die. He banked over the Bois d'Arlon, heading down-wind for the field. The Spad swayed as it passed above the last patch of trees. He dropped it quickly, knowing the danger of a down-wind, dead-stick landing. It thudded to the ground, veered crazily toward the hangars. He fought the ship back into partial control, and it rolled to a stop near a flight of Nieuports on the line.

Even before he saw the restless groups of pilots and mechanics clustered near the hutments, and the extra squadrons lined up beyond the last hangar, Strange sensed the fear and tension which gripped the field. The combined emotions of the crowd struck his keenly attuned mind like a sudden roar of sound upon the eardrums.

He stepped from the cockpit, lighted a cigarette. Two mechanics were approaching the Spad, but a chunky colonel with a face like a bulldog curtly waved them back. Strange had already recognized the G-2 chief from his quick, jerky stride. But it had been many weeks since he had seen such a strained, haggard look on Colonel Jordan's face.

"Come along to Wing headquarters," Jordan muttered, without even a preliminary nod. "A terrible thing has happened, and we've got to go after it without wasting a second."

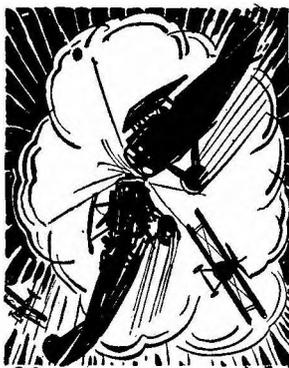
Strange's keen eyes searched the colonel's face. "Something about headless men?" he said. It was more a statement than a question.

Jordan started violently. "How did you know?" he rasped.

"I saw the Red Cross tents near Grancy," said Strange. "Something in my mind hooked it up with a scene I saw in the Channel."

Jordan had stopped short. The haggard look in his eyes deepened as Strange related what he had seen on the British vessel.

"Good Lord!" he said hoarsely, when the G-2 ace had finished. "Where will it strike next?"



"Then I was right?" said Strange.

Jordan stared up at him, and his eyes held a sickening look. "Strange, that 'Headless Death' has killed two thousand men and made a lane of horror from the trenches clear to Grancy!"

CHAPTER II

LANE OF DOOM

PREPARED though he was, Jordan's tense words sent a shiver down Strange's spine.

"You mean everyone in that 'lane' has been killed the same way?"

"Not everybody. There are a few who survived, and that makes it even more of a riddle, for they can't tell how they did, or what happened to the others."

"But most of the victims were headless?" queried Strange.

"Almost every one who was killed had his head blown off," Jordan answered grimly. "But come inside, and you can see some of the reports."

They went past the groups of frightened, whispering men, into offices where the senior officers were obviously but unsuccessfully trying to hide their fear. Three lieutenants were taking down telephoned reports, while other officers hung over their shoulders and watched, white-faced, what they wrote. Hardly anyone looked up as Strange and Jordan entered. The G-2 chief led the way to an office he had appropriated.

"When did this happen?" Strange asked as Jordan closed the door.

"I can tell you to the dot," muttered the colonel. He sat down, ran his haggard eyes over one of the reports spread out on the desk. "It hit the trenches at two-twenty this morning and left about three hundred men dead in the firing trench, at this point in D sector."

Strange glanced at the spot Jordan had marked on the wall-map. Two parallel red lines had been drawn from the trenches almost directly northwest to the village of Grancy.

"Corresponding numbers were killed in the second and third trenches," Jordan continued huskily. "All but a few out of the first and three hundred were headless. The 'lane' took in some of our troops and a French battalion billeted in the eastern edge of the Bois d'Arlon. It caught two companies on the Vaulecourt-Grancy road, also a supply train. The trucks were carrying ammunition, and every one of them blew up. We heard it clear in Chaumont. It woke me out of a sound sleep, and that's how I got on the job so soon."

"There must have been eye-witnesses along the edges of the death-lane," said Strange. "What do they say?"

"The stories are confused," grunted Jordan. "A sergeant on the northern edge, up in the firing trench, says he felt dizzy and couldn't get his breath for a few seconds. He's not sure whether he passed out or not, but he admits hearing sharp explosions and seeing queer flashes of light. When he crawled into the next trench bay he found five men with their heads blown off. Two of them had lost their hands."

"Did the Germans follow this up with an attack?" Strange asked quickly.

"No," said Jordan, "that is, not until an hour ago when they made a sudden attack for a mile along that area."

Strange gazed at the map. "No one thought, I suppose, to crawl over and see if anything had happened to the Boche directly opposite that stretch?"

Jordan stared. "Why should they kill their own men? You mean they might have made a mistake aiming it?" Strange squashed out his cigarette.

"What makes you so certain it's a death-ray? You

used to pooh-pooh the idea of such a thing."

An odd helplessness crossed Jordan's face.

"It's the only thing that can explain it, Strange."

"Why should it blow off a man's head, and not destroy him completely?" asked the taller man.

"I don't know," said Jordan. He clenched his thick fingers. "But we've got to find the answer, and find it quick! That whole lane was stricken in seven minutes—it was 2:27 when it hit the edge of Grancy. Thank Heavens it didn't go any further—there are ten thousand troops billeted in the area beyond. But if they can do that much in seven minutes, think what they could do if they really tried!"

"I am thinking," Strange replied grimly. "But before I go across the lines—I assume that's what you want me to do—I'd like more information on this affair."

"Shoot," grated the G-2 chief.

"How wide is that death-lane?" asked Strange.

"About a hundred yards, perhaps a trifle less, up at the trenches," replied Jordan. "Then it tapers slightly, and is about two hundred feet wide the rest of the way to Grancy."

"How sharp are the limits?" said Strange. "Were there any other instances where a man was unharmed but saw some one else killed, a few feet away?"

"**T**HE reports are contradictory," muttered the colonel. "They always are in such cases, as you know. But the limits seem to be irregular. Those two red lines on the map are only approximate. The lane curves once or twice, and in several reports here you'll find men billeted just inside the 'lane' but who weren't hurt. Also, there are some cases of headless corpses being found just outside the area I've indicated."

Strange looked down absently at his oil-spotted flying coat. "What report do the Army doctors give on the cause of deaths?"



"Nothing of any value," snorted Jordan. "They say the heads and hands were blown off in some kind of explosion. Any fool could tell that."

"From what I could see," said Strange, "the bodies on that vessel hadn't bled. Was it the same here?"

"Yes," replied Jordan. "The medics say it's because the wounds were cauterized by the heat of the explosions. I figure it was some kind of

invisible heat-ray."

Strange stood up, drew a line through the center of the death-lane.

"I've already doped that out," said the G-2 colonel. "And I've sent five pilots across to fly in that direction and see what they can find."

"G-2 pilots?" asked Strange.

"Two of them were. The others were from the G.H.Q. courier detail. I'd have sent the Jay twins, but they're down at Marseilles on a spy job."

Strange shook his head. "It's getting more and more dangerous to send them into Germany. I'm glad they're out of this affair."

"What are you doing there?" Jordan barked.

Strange had drawn a line back to the point where he had seen the British vessel.

"It's well over two hundred miles from this part of the Front," he said, measuring the distance. "I can't believe in a death-ray that would reach from behind the German lines to the Strait of Dover."

"All right," growled Jordan, "then you figure it out."

"I'd like to see a few of the bodies," said Strange thoughtfully.

"That's easy," retorted Jordan, with a grim humor. "You can see plenty over at Grancy."

"Who ordered the 88th and the 35th squadrons here?" Strange asked as they started out into the hall.

"General Bonner," said Jordan acidly. "He got the bright idea the sector was being bombed, when the first alarm came in. He ordered both night pursuit outfits up here. Any fat-head could tell the Boche wouldn't be flying in this pea-soup weather. They'd have to be right on the ground to hit anything."

"I agree with that," Strange nodded. "But I wonder where von Munster comes into this."

"Queer, his being out there," grated the colonel. He stopped, as one of the lieutenants taking reports gave an exclamation.

"What is it?" he snapped.

"They've found an old French peasant alive right in the middle of the death-lane!" answered the lieutenant. "He came out of his hut just as the searchers reached that area, and they say he didn't even seem to know anything had happened. Everyone else around there was killed."

"Tell them to have that man brought to Third Corps Headquarters at Grancy," Strange ordered quickly. "And see if you can get any other details now."

After a few moments the lieutenant put down the phone.

"He's so scared he can't even talk. But they'll take him to Grancy at once."

Colonel Jordan and Strange went out. The G-2 chief beckoned to a nervous-looking captain and told him to order a car.

"I had a G.H.Q. pilot fly me here in a D.H.," he said to Strange. He looked up into the thick gray mist. "But I think I'll go back by automobile. We nearly hit a tree when we landed."

"I keep thinking back to von Munster," said Strange. "Have there been any other reports on his old outfit since I went to England?"

Jordan rubbed his protruding lower jaw.

"Only another rumor that it was filled up with new men, and the old pilots transferred somewhere. His worried eyes suddenly took on a startled look. "Hell's bells, I wonder if there could be any connection—no, it's ridiculous."

"What's that?" asked the G-2 ace.

"The idea of the Red Skull *Jagdstaffel* and those headless men," muttered Colonel Jordan. "You've seen the insignia of the squadron, of course?"

Strange grimaced.

"Yes, a pretty thing—a skull dripping with blood."

"It looked half-way like a bloody head, the photo I saw," said Jordan. "And now these headless corpses. I wonder—"

"It's probably only a coincidence," Strange commented, as the colonel left the sentence unfinished. "They had that insignia months ago."

"This thing may have been planned that far back," insisted Jordan.

"Why would they risk giving away the secret?" queried Strange.

"The Boche does some dumb things at times," grunted Jordan. "They might've been doing a little advance gloating."

An Army car rolled up in front of them. The G-2

chief opened the door, but Strange suddenly turned back to the Wing headquarters.

"One moment, colonel. I forgot to put through a message to the British. I'd like to get a report on that vessel as quickly as possible."

He entered the building, scribbled a few sentences in code, and gave the paper to the Communications Officer.

"Priority," he said, presenting G-2 credentials which carried his pseudonym of Captain John Neville. "Colonel Jordan wants it pushed, and the answer sent to Third Corps." The officer took the message.

STRANGE hurried out. Just as he stepped outside he heard a faint, but high-pitched howl from up in the murky heavens. It increased swiftly in volume, became unmistakably the sound of a plane diving at terrific speed.

The groups of men along the tarmac stared up into the mist. Three or four officers dashed from the Wing office, and in a moment the raid siren wailed out its hasty warning.

"Not taking any chances!" panted a stout major as he trotted past Strange. "Can't tell what it might be."

The shriek of the diving ship grew louder and equaled the siren in its piercing howl. Ground men made for the gun emplacements, and some of the pilots ran to their ships.

A blurred shape pitched down through the drizzle. So fast was it diving that Strange thought it would plunge straight into the ground. But with a wild screech of strained wings, it pulled up and raced above the woods. As it whipped back, he saw that it was a Fokker triplane. The engine was not switched on, but the ship was still moving at furious speed. As it approached the field, the pilot kicked it into a wild fishtail.

The triplane screamed, lost speed. The pilot kicked it to the other side, and again the strained wings moaned. Still fishtailing violently, the Fokker came down toward the drome. Then with an abrupt change of tactics, the pilot leveled out in as cautious a glide as a novice on his first solo. Slower and slower, until at last the wheels gently brushed the ground. The triplane came to a stop two hundred feet from the line.

Even at that distance, Strange could see the pilot's ghastly face. He whirled to Colonel Jordan, who had jumped from the car as the raid alarm sounded.

"It's Jack Conway!" he said tensely. "He must have brought some word about this!"

Jordan scrambled back into the machine, and Strange sprang to the running-board, and the man at the wheel sent the car racing toward the Fokker. But swiftly as they had moved, Conway was already out of the triplane's cockpit.

"Keep away!" he screamed as the car slid to a halt. "For God's sake, don't come near me!"

Strange stepped from the running-board, stared at the G-2 pilot. Conway's pallid face was wet from the rain. He had not pushed up his goggles, but his eyes shone through the dripping lenses with a desperate light.

"Conway!" burst out Jordan. "What is it, man?"

The pilot's lips moved, but his words were lost in the roar of the onrushing mob. With a frenzied effort, he managed to make himself heard.

"Keep them back! I've got to tell you before it's too late!"

Jordan wheeled to block the excited crowd of pilots and mechanics. Conway's wild eyes turned toward Strange.

"It's coming! You've barely time to get away. But—"

"Grab the Hun!" bawled a voice. A group of men rushed around the halted car.

Conway reeled back with a strangled cry.

(Continued on page 62)



Snapshots of the War



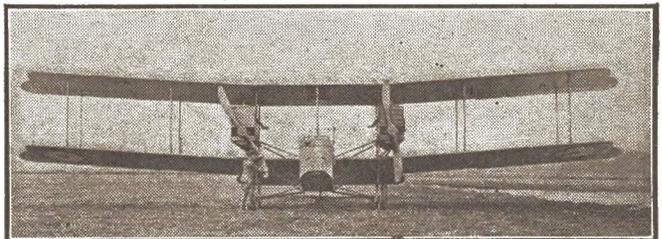
Left: Here's a new one for you. It's the French Morane biplane, a war-time model that boasted a lot of advanced ideas. Note the cowling and the prop spinner. Quite modern, eh? And what do you think of that spare wheel they've tied onto the undercarriage? That was just in case the pilot had a bad landing somewhere. The Morane was a two-place job. (Puglisi photo.)



Below: If you don't believe times were pretty bad for the Germans late in 1918, take a good look at this Hanover CL-III A, one of their single-seat fighters. Do you see that undercarriage? Well, there was a serious shortage of rubber in those days—so they tried to fly them off with wooden wheels! Also note the Hanover's double tail surfaces. (Puglisi photo.)



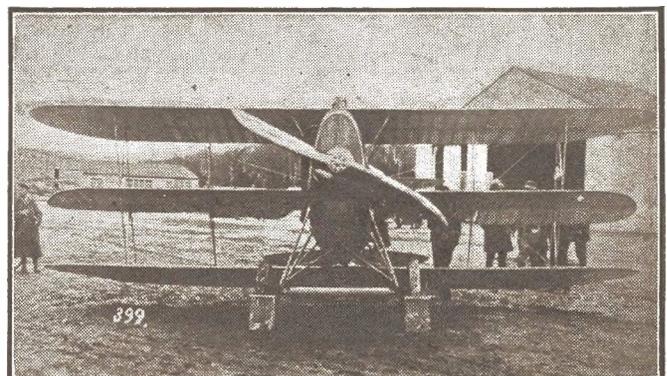
War in the early days. That's when you saw a lot of these British R.E.8 reconnaissance ships. This one was being prepared for a patrol over the enemy lines. A close inspection will disclose that both British and French mechanics are working on the old "Harry Tate"; and that Limey pilot in flying boots is no doubt getting set to take up the French observer shown beside him wearing a large fur coat. Note the Lewis gun mounted on the rear center-section strut. What a war!



Presenting the DeHavilland 10 bomber, another of the famous line designed for the much-threatened air raid on Berlin. This ship later saw pioneer commercial service with Imperial Airways. (Puglisi photo.)



The photograph above was taken at the Johanisthal Aerodrome in Germany in the summer of 1918. It's another unusual "shot" for you picture fans—the Fokker Dr-1, fitted with a 180 h.p. Siemens-Halske engine. Remember what we told you about that engine some time ago? It incorporated the features of both the radial and rotary motors. Apparently, there was considerable torque involved in the arrangement —for note the four-bladed prop used to "smooth" it out.



Another triplane for you! This one is the D.F.W. Dr-1, which was built by the Jerries in 1917. But it failed to make much of a mark—because Britain's Camels and S.E.5's appeared on the front at about the same time and gave 'em too much competition.

Battle Tactics of Bombers

DRAMATIC MODERN AIR COMBAT FEATURE

By David Martin

Author of "Tactics of Two-Seaters," "Tactics and Strategy of Modern Sky Fighting," etc.

HOW does the bomber-fighter "work"? What is the role played by these huge ships which carry several movable guns, and what kind of opposition must these craft face? Those are the questions we'll now consider.

First off, the modern heavy bombers—jobs like the new Douglas, the Boeing 299, the British Heyford, and other machines of their type—raise a special problem. That's because (1) they do not have fixed guns for the pilot to fire, and (2) it's an undeniable fact that the bomber *must* go into enemy territory to drop their explosives. Whereas single-seaters and observation ships generally do their work reasonably close to their own lines, the bomber is scheduled to go deep into hostile land to reach objective targets.

Of course, the leader in charge of a bombing raid may change his objective if certain conditions arise that pre-

The toughest job in the air service! That's what they've dealt the bomber boys—for the "flying fort's" entire sphere of action lies behind the enemy lines, where pursuit and attack jobs lurk, ready to pounce upon them. Against such odds, the bomber must boast plenty of gunnery teamwork. And unless the fellows who man those guns have the trigger skill of Deadeye Dick . . .

vent attainment of the target originally decided upon. Perhaps fog or headwinds will be the monkey wrench in the works, and in that case the bomber may drop his "eggs" on any other suitable target within reach. But in any event, effective action on his part still calls for work on the "other side," whether it's the original objective or not. And hence he has to face opposition, either from enemy A-A guns, enemy aircraft, or both—mostly both.

This, then, is the ultimate problem of bomber air-fighting; and the paramount issue these forts of the sky must contend with is the enemy fighters—pursuit and attack jobs.

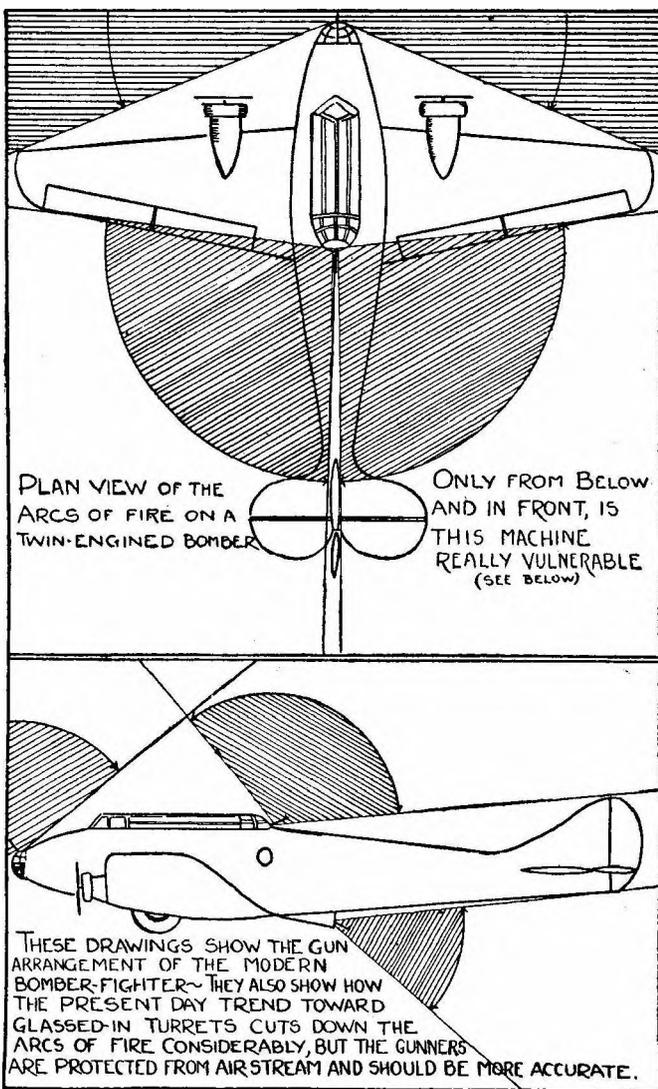
The fighter bomber can expect little help from his own side—for the simple reason that the average heavy bomber carries much more fuel than the fighter, and has to go greater distances to reach its objective. It's true that the bomber boys may be escorted across the enemy line for short distances; and whenever possible the fighters will be on hand to pick them up again on the return journey to attempt to get them through the last few miles of interceptor defense and back into their own territory. But actually, the average bombing raid demands that these big ships fight their own way for fully two-thirds of the actual distance over enemy territory.

Today, with the improvements in gunnery, formations, and speed, the fighter-bomber is believed to be capable of holding off an equal number of defensive single-seaters. In theory this may be okay, but whether theories conceived in peacetime will work out when war breaks out is quite another matter—a matter that awaits solution by the gunners aboard the bombers, and by no one else!

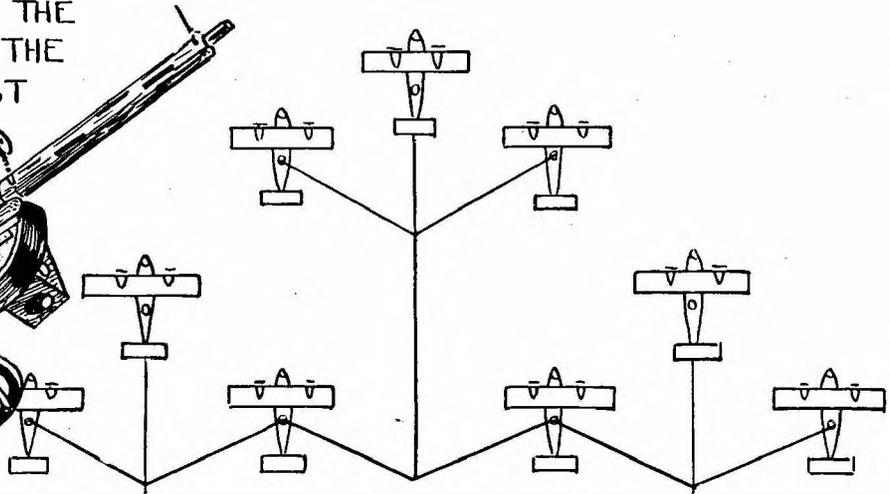
The main object of the fighters is to shoot the bombers down before they reach their objectives. It is now agreed, even by well-known commanders of fighting groups, that they have little chance of stopping *every* bomber of a squadron formation from reaching its target and dropping its bombs. But they do hope to stop most of the bombers and then finish off a few more of the air forts when they fight to get back inside their own territory. They also hope to discourage further attempts and eventually cause all long-distance bombing to cease.

As far as effect on morale is concerned, a bomber shot down on its way back, even though it has staged a successful raid on some important point, is just as much a loss and a shock to the squadron it represents, as if it had been downed before reaching its target.

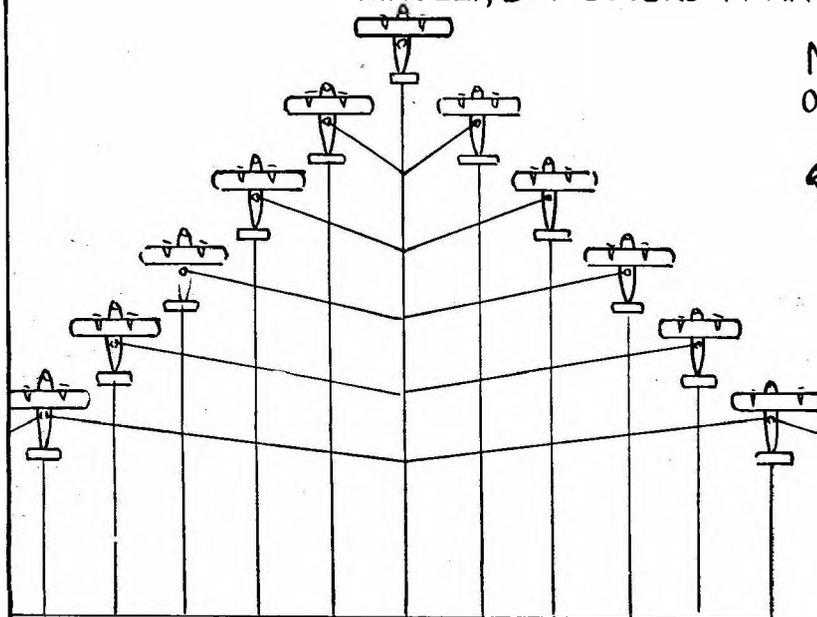
Also, we must figure that if the fighters force the bombers to abandon their original target for a lesser important point, they have scored a victory. If they harass the raiders so much that the bombers are forced to "swing their tails" while in formation, they have not



THE GUNNER WILL BE THE MAN OF THE HOUR IN THE NEXT WAR~AT LEAST ON THE HEAVY BOMBERS.

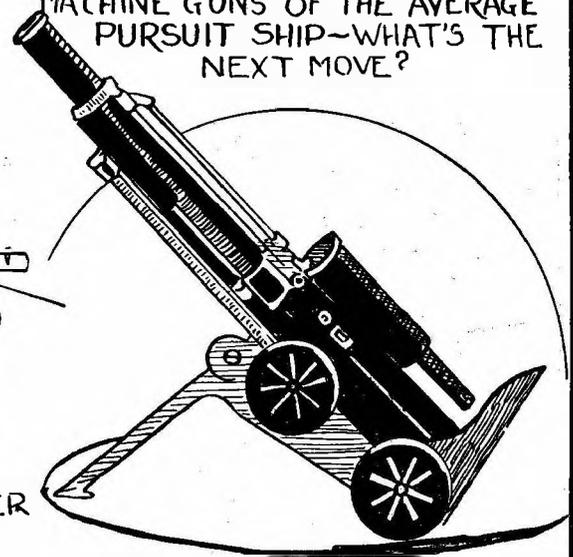


BOMBERS IN SQUADRON FORMATION SHOWING HOW GUNNERS USE THE CROSS-FIRE SYSTEM AGAINST ATTACK. TEAMWORK! NO GUNNER DEFENDS HIMSELF, BUT COVERS A MACHINE ON EITHER SIDE



ILLUSTRATING THE TERRIFIC GUN-POWER AVAILABLE BY USING THE SQUADRON-VEE FORMATION ADOPTED DURING DAYLIGHT RAIDS ON THE WAY TO THE OBJECTIVE. NO SINGLE-SEATER COULD FACE THIS FROM ABOVE.

NEW HIGH-SPEED CANNON NOW USED ON BOMBERS FAR OUTRANGE THE MACHINE GUNS OF THE AVERAGE PURSUIT SHIP~WHAT'S THE NEXT MOVE?



THE NEW AMERICAN JOYCE AVIATION CANNON~100 SHELLS A MINUTE.

only slowed up the raid, but have automatically weakened the defensive plans of the gunners. (See accompanying drawings of formation coverage.)

ANOTHER move on the part of the defensive fighters is to force the bombers up to greater altitudes and thus cut down their bomb-dropping accuracy. The anti-aircraft guns and searchlights can help in this matter, too. Perhaps the explosives will then hit the home of a poor civilian rather than an ammo dump or factory. The said poor civilian might consider that a point scored—but it wouldn't be considered a military advantage.

In the case of the heavy-bomber, much rests on the skill of the gunners. While the searchlights might betray them and anti-aircraft guns annoy them, it is the gunners who actually bring the bombers through—not

the pilots! That's because they've got those single-seaters to face.

This may sound like treason, but I speak from experience, having taken part in many long distance raids on various types of bombing craft. It was my observation that the ships we lost were lost only after the gunners were put out of action. How much this situation may weigh under modern conditions is hard to say, but it's dollars to doughnuts that no bombing plane, or pilot, is any stronger than his guns or gunners.

A pilot may be a fighting hero in a single-seater, a two-seat fighter, or even, in some cases, aboard a so-called medium bomber, where he has a fixed gun for his own use—but on the heavy bomber he doesn't operate guns, and so he's entirely in the hands of the men who

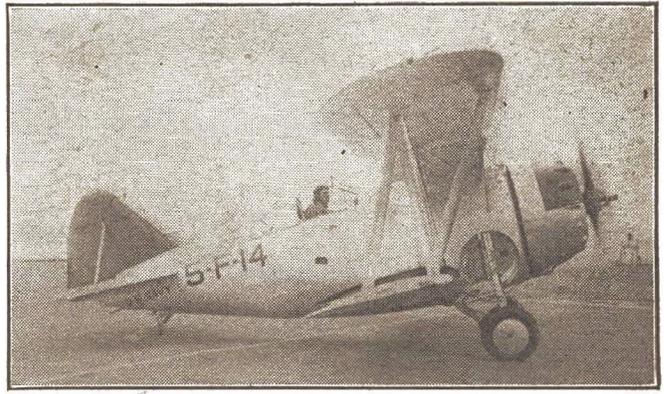
(Continued on page 91)

Staunch Ships of Our Sky Services

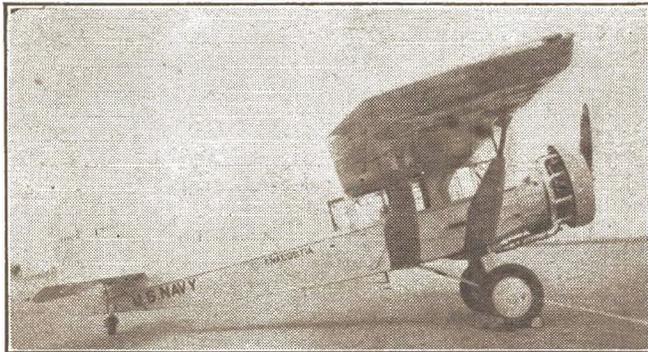
Herewith, we offer you a gallery of eight interesting aircraft now in every-day use by the Army, Navy, and Marine Corps. Note the wide range of types required in maintaining an efficient air service.



THE Navy is going in strong for the Grumman! This is the new XF2F-1 two-place shipboard fighter. It mounts a Twin-Wasp, which gives the craft considerable more speed than the original model which employed a 710-h.p. "Cyclone" and had a top of 197 m.p.h.



ANOTHER Navy Grumman—this time the single-seater known as the F3F-1. The ship boasts a very high top speed, but no official figures on its performance have been released. The Navy has ordered 58 of 'em.



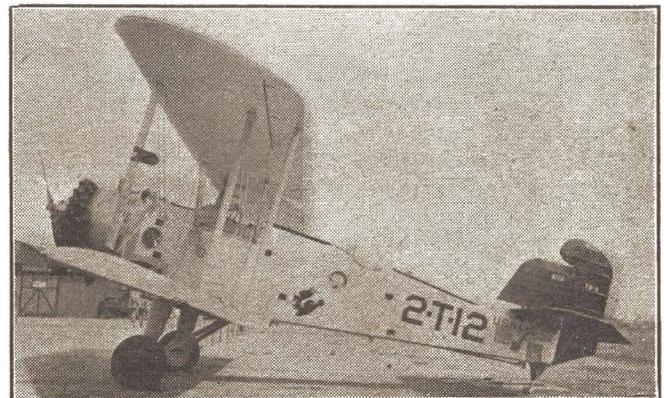
THE Bellanca C-27, a military version of the famed "Aircruiser." It's now used by the Army as a transport and cargo carrier. Several South American governments have bought these for general purpose work. That's a 610-h.p. "Cyclone" you see in the nose.



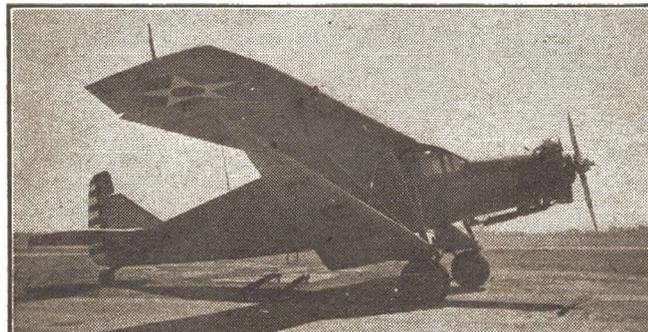
HERE'S a little-known military observation plane used by the Army. She's the Curtiss Raven O-40-B, which is said to do 138 m.p.h. A semi-sesquiplane in design, the Raven has a retractable undercarriage, mounts two Browning guns, and carries considerable observation equipment.



PRESENTING Curtiss' new Helldiver F8C-4 now being used for dive bombing by several Navy squadrons. This "shot" is interesting, since it shows the upper-wing gun and the special bomb racks fitted beneath the wing.



THIS is the Navy's Great Lakes TG-2 dual-purpose plane. It's a three-placer that can be used either as a torpedo carrier or light bomber. Top speed fully loaded is 127 m.p.h. with the 575-h.p. "Cyclone." She also comes in a seaplane version.



ONE more Bellanca—the Navy's XRE-2, a six-seater military rendition of the Senior Skyrocket. That "R" in the designation means "transport" in service language.



OUR Marines also have a transportation problem, and they take care of it with this Curtiss Kingbird, known as the RC-1. The ship is an eight-seat cabin craft fitted with Wright "Whirlwinds." It's not so new—but it seems to do the work required.

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.



YES, BUT GO EASY!

Aviator (with Flying Flea): Give me one-third of a gallon of gas and an eighth of a pint of oil.

Mechanic: Shall I blow to start your propeller, sir?

INSULTED!

Customer: Have you aircraft dope?

New clerk (heatedly): No, we don't carry airplanes—and don't call me a dope!

FAMOUS LAST WORDS IN AVIATION

"Watch this new stunt I just invented."

"This is the third turn, so now I'll bring 'er out."

"Don't bother about those bombs under the wing—they're just dummies."

"I didn't know this wing walking was so easy."

"Certainly, our landing gear is down!"

"I don't need my safety belt for this one."

PHOOEY!

Archeologist: You say your new glider is pre-historic?

Glider pilot: Well, I've christened it the "Dina"—because Dina soars.

FOOLISH QUESTION

Managing Editor: I want you to go out and interview that inventor who's just tested his new sheet-steel parachute.

Reporter: Okay, boss. But where will I find him?

Managing Editor: In the hospital, you dumb dope.

TRIAL AND ERROR

THE motor which ran the huge wind tunnel had broken down and two mechanics were scrambling over the apparatus bent on repairing it. Finally, one of the mechs noticed two wires dangling from the machine.

"Hey," shouted his companion, "grab hold of one of those." And as the mechanic did so, he added, "Do you feel anything?"

"No," answered the other.

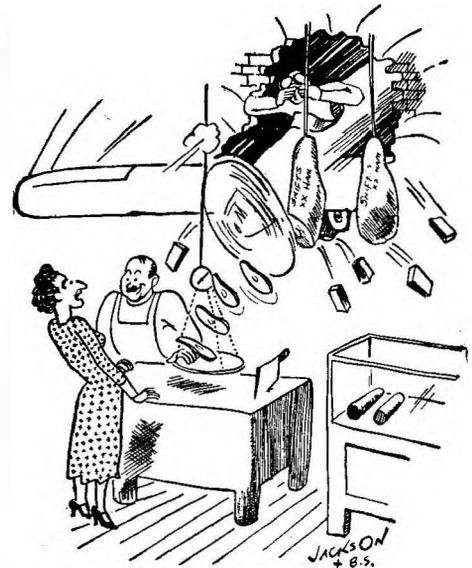
"Then," came the reply, "don't touch the other one—it's carrying 30,000 volts!"

EXPECTED TOO MUCH

AS the mail plane landed, the face of the operations manager broke into a broad smile. He hurried across the field to the pilot and proffered him a box of cigars.

"Here's a present for you," he cried to the flyer enthusiastically. "This is the first time in six months that you've come in on time!"

"Keep your cigars," replied the pilot. "This is yesterday's plane!"



"Couldn't I persuade you to try our ham, Mrs. Blinkus?"

NATURE KNOWS BEST

Grandson: I'll have my flying license soon, grandma. Then I'm going to fly you out to the country in my airplane.

Grandma: Nonsense! When I go to the country I'll go by train—the way nature intended us to travel.

WHEN Little Audrey heard that pilot Jones had been hit by a bolt of lightning she just laughed and laughed—because she knew he was grounded.

EMBARRASSING MOMENT

First flyer: That parachute jumper, Busby, got into a frightful predicament down at the beach the other day.

Second flyer: Howzat?

First flyer: It happened in the middle of a high dive. He forgot he wasn't bailing out of a plane and pulled the rip cord of his bathing trunks.

BAD HABIT

Stude: Good heavens, you're all covered with bandages. What happened to you?

Absent-minded pilot: Well, you see while I was flying yesterday I threw a lighted cigar from my plane—and then I tried to stamp it out!



"Hey, bring that here! I need an exclamation point!"

Fish and Gyps

WITH A "FLYING CIGAR" FOR DESSERT

THE little word "if" packs more punch than a Howitzer. Lieutenant Phineas Pinkham, the ace who was generally in the hole, became strongly aware of that fact in the year of our Lord one thousand nine hundred and eighteen.

If Phineas had not flushed up a certain well-born Von back of the Yankee lines one blithe day in May, and if he had not brought said Von to earth with quite a thud, the Allies would hardly have known much about that new threat to the democratic world. If the Yankee lieutenant had lost the decision in the brief brawl with the flaxen-haired Heidelberg alumnus, the miracle man from Boonetown, Iowa, pride of the Pinkhams and exponent of all the doubtful arts of hood-winking, skull-duggery, and legerdemain, never would have found himself in dear old London seven days later. But let us start at the tip of the tale, as the flea said when it hopped aboard a passing canine—

Herr *Leutnant* Ludwig Friedrich von Sputz was on his way back from a snooping assignment over the Yankee back yard when he ran into Lieutenant Phineas Pinkham over Framerville. Phineas had tarried in the scraposphere that morning after Captain Howell and

"Hail, the Conquering Hero Comes!" To those rousing strains, the Brass Hats paraded Phineas back to the States. And so, Garrity rejoiced as peace finally reigned once more on the drome of the 9th. But how was the Major to know which way the Pinkham parade was headed? And who'd have expected the von Sputzes to supply that parade with its main "float"?

the rest of "A" Flight had gone back to the Ninth, satisfied that the Krauts had overslept. The patrol had been a dull one, and like a fisherman who hates to go home without so much as a minnow in his basket, the Boonetown pilot had chosen to remain in the ozone.

After his Mercedes power plant had been given an acute case of asthma by a dose of Vickers lead, *Leut-*

nant von Sputz decided to concentrate on discretion rather than valor. So he dived down to the Allied linoleum not far from Blercourt and piled his Pfalz against a stout apple tree. The Von was slightly used up when he reeled away from the wreck, having lost a bicuspid or two in a head-on collision with the instrument board of his Pfalz. A small patrol of Yank infantrymen were holding him down when Phineas came running from his landing site.

"Wee gates!" Pinkham neighed at von Sputz. "Well, both of us could not win, huh? Haw-w-w-w! Let the Heinie up, bums! Where is your hospitality?"

"There's one over by Souilly," a pint-size dough piped up, "but it's too far to carry him. Maybe we could just bandage him up here, sir."

"The ignorance in this army is awful," Phineas sniffed. "I guess you've got to git up, Hans, an' follow me. I've got to have plenty of proof when I knock off a crate. If I didn't forget so easy, I would have brought my Brownie with me. C'mon, let's *allez vite*, *Mein Herr*."

PHINEAS brought his prisoner to the Ninth Pursuit Squadron two hours later. Strangely enough, Major Rufus Garrity did not seem to be displeased with Lieutenant Pinkham despite the fact that Captain Howell had been beefing to him for an hour anent the man from Iowa. As a matter of fact the Old Man's face was decked in a grin, but if Phineas had bothered to peer at Major Garrity closely, he would have detected a dirty undercurrent behind it.

"I'm gittin' sick of you running out of the fight!" Howell hollered at his errant flyer. "Am I the boss—or are you, you freckled son-of-a-sea-gull? Let me tell you—"

For answer the prodigal pilot pointed to the alien he had brought in on the hoof. He sniffed, "The idea of my bein' over here is to capture Vons, ain't it? Or should I just wash windows an' mow the lawn? Haw-w-w-w! Where is *your* day's catch, Captain Howell?"

"I demand a little respect around here!" snorted the flight leader.

"I am givin' you as little as I can," Phineas retorted obligingly. He turned to *Leutnant* von Sputz. "Ya see what I have to put up with. No wonder you enlisted with Germany. Have a chair, *Mein Herr Leutnant*, and I will scare up a bottle of coneyac or three."

Ludwig Friedrich von Sputz, late of His Imperial Highness' Air Corps, proved to be a garrulous Kraut. He leered at the Yanks who formed a semi-circle around him and boasted of his lineage in broken king's English.



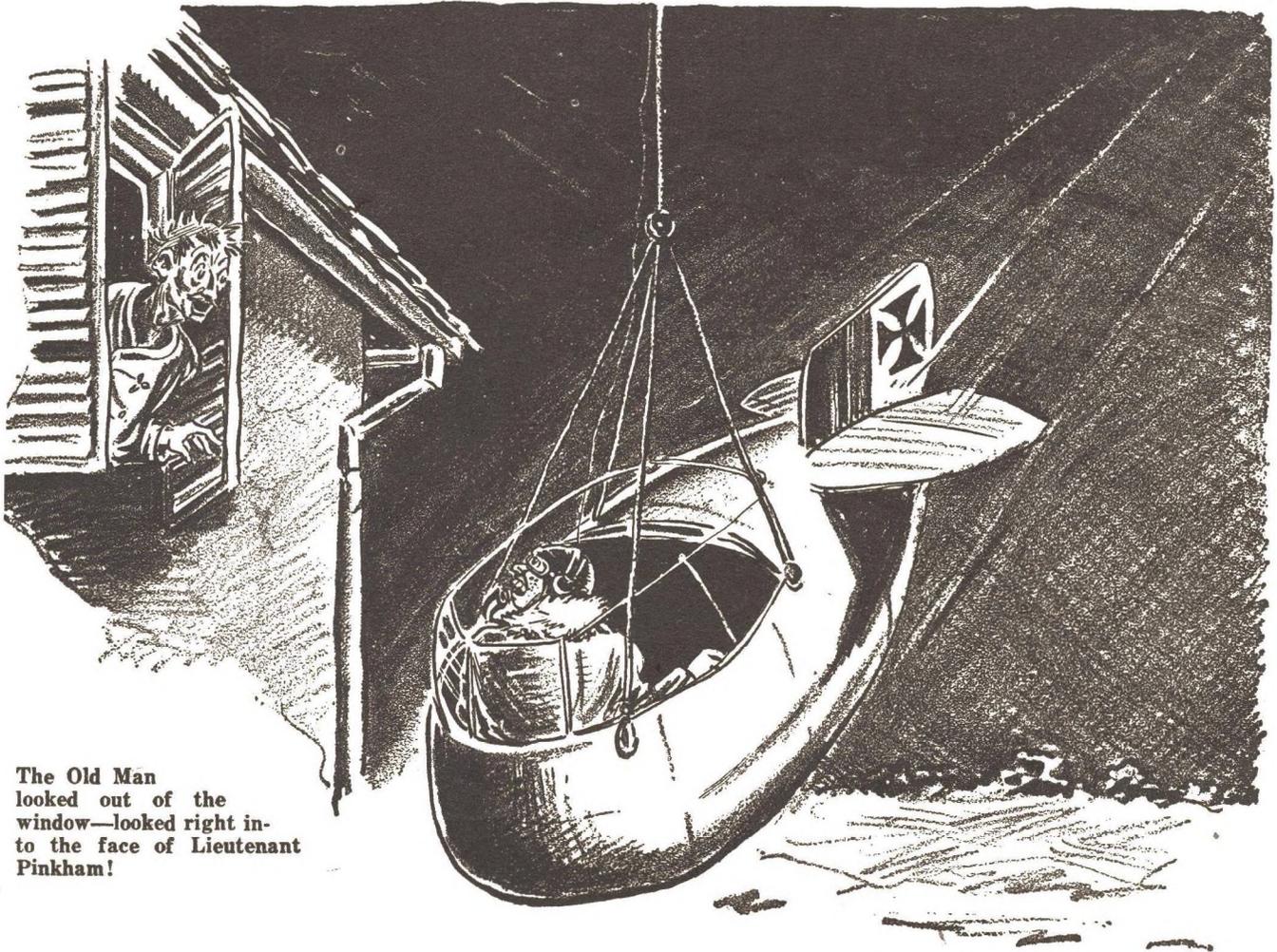
Von Sputz walked away with a big gap in his front teeth. When that Pfalz kissed Mother Earth, he'd kissed the instrument board.

ANOTHER "PHINEAS PINKHAM" LAUGH PANIC

By Joe Archibald

Author of "Blois, Blois, Black Sheep," "Scratch-As-Scratch-Can," etc.

With Illustrations by the Author



The Old Man looked out of the window—looked right into the face of Lieutenant Pinkham!

His bragging included reference to the latest piece of ingenuity that had waked to life in the Rhineland. It proved to be a revelation that knocked the Allied peace of mind into a state bordering on *non compos mentis* (early Italian for nuts). For days the brass hats had been kidding themselves that the bombing of the Limey sub in the Channel had been the result of an accident, that the high test egg had been unloaded in a hurry and had just happened to tag the E-17. The E-17 had been browsing about the bathosphere seventy feet down!

Seeing and enjoying the discomfiture of his captors, Herr von Sputz amplified his boast. "*Ja, das ist der aggsident, nein! Ach, ve Chermans, was ist ve do him nexdt? Der Von Sputzes idt ist, Mein Herrs. Mein Fader ist vhat drops idt der bomb by der untersea boadt vunce, ja! Mein brudder giffs by der gross Zeppelin L-72 alzo. Hah, sigs odder Englander untersea boadts ist kaput! Ho! ho! ve haff idt der zounding intruments und der telescopic zights vhat shows by us vhere ist der boadts unter der vasser.*" He paused when Phineas Pinkham handed him a bottle of Frog pep juice and took a prodigious haul at it. The potent brew of the grape of Sunny France enhanced his loquacity.

"*Der big Zeppelin, vhat did idt—ah das ist der besser vun vhat der Kaiser gets, ja. Alzo maybe she flies by America und drops idt der bomb yedt.*" Von Sputz was growing in his own estimation as his stomach expanded with firewater. "*Der Tag ist close, Schweinhunds!*" he yowled. "Look—I am of *der von Sputzes*. Look vunce,

das ist der von Sputz crest I haff." The Teuton pulled a circular silver disc from the chain of a watch half the size of a turnip and handed it to his capturer.

"Haw-w-w-w!" guffawed Phineas, his fingers appearing quite restless as he bent an appreciative gaze on the trinket. He waited for *Leutnant* von Sputz to down another half quart of cognac before he returned the disc. By that time the *Herr Leutnant* was too goggle-eyed to attach it to the silver chain and Lieutenant Pinkham volunteered to help him. It was not until hours later, when the *Bocke* headed for a stockade, that he discovered the coat of arms of the von Sputzes to be missing from the little disc. Also the disc he now had was no silver affair, bending double under very little pressure of the Heinie's fingers. The words on the bogus silver piece read: *First Prize, Sack Race, Boonetown Fair, 1912. Phineas Pinkham.*

"*Gott in Himmel!*" wailed von Sputz to a Yankee guard. "Robbed I haff been yedt."

"Oh, I'll call a cop right away," chirped the lantern-jawed corporal. "Shut up or I'll conk ya!"

NOW not long after von Sputz had been taken to the Allied hoosegow, Major Rufus Garrity called Phineas Pinkham into the Operations Office. The smile was still on the Old Man's face so that if Phineas had only been on the *qui vive*, he would have noted ulterior qualities about it.

"Well, it's about time I was appreciated around here,"

began Lieutenant Pinkham after a very careless salute. "I thought sure I was goin' to have trouble with you again about leavin' forma—Haw-w! When I get to Paree the next time, I will bring you back the best cigar in town an' it won't be loaded, sir. Well, I have things to do in my hut so if we can get down to—"

"Pinkham," Major Garrity ground out, and with every word he smacked his lips as if he were tasting honey, "you are not going to Paris. You are going back to the U. S. A. in just a day or so. Of course, it is going to be hard on us here—being left behind while you become the toast of the people—"

"Huh?" the victim gulped. He even forgot to plant the loaded bon bon on the Old Man's desk. "Y-you're kiddin', haw-w-w-w! Boys, at times you can be droll, sir. Haw-w-w-w!" And he swaggered hopefully.

"I was never more serious even when I got myself married," the C. O. assured him. "It seems that the brass hats have decided that you have become a hero of this Great War—that you will spur men to enlist in the air services in two countries. Yes, sir, the Allied bosses have decided that you have risked your life often enough for the cause of Democracy. So-o-o, even though I don't see why it should worry them if you get bumped off, they have decided—why, Lieutenant, you don't seem very grateful to—"

"It's a frameup!" Phineas howled. "They tried that once before on me but it didn't stick. Oh, I'll show them fatheads. That is what I git for all I've done, huh? Speakin' pieces in town halls, ugh! I will resign. I will join up with the Frogs even. I know my rights as a citizen. I will see a lawyer—give me some paper an' ink. I will quit right now. I thought you was actin' too much like a human bein', you old—er—sir! I—"

"Try an' crawl out of it, just try!" the Major dared him. "Just try to get near a Spad from this minute on. I have given orders that you be shot if you get within twenty yards of one," he gushed like a sperm whale. "Sergeant Casey and two other non-coms are carrying two guns like western movie villains. Ha! ha! You're booked for a Chatauqua circuit, Mr. Pinkham, and the public will not be disappointed! Thanks for the cigar just the same."

"Nuts to the public," blazed Phineas, jumping up and down as if he were stamping out a fire. "I—oh, awright, awright! Wait until I talk. I will not only scare everybody out of the *guerre* who *wants* to git in it but I will make the bums desert who *are* in it. I will tell about the awful way the Heinies mangle up prisoners and how guys like you tie raving maniacs into Spads every morning. I'll tell 'em how the Krauts come over every day and drop smallpox germs in the trenches and about the poison gas—oh, I'll show 'em. Boys!"

"It's all right with me," chortled Major Garrity. "They will shoot you for that. Now get out of here. I am expecting some brass hats."

"Uh—er—gettin' worried about the Kraut gas bag, huh?" the unquenchable Phineas tossed out. "Haw-w-w-w! Somethin' just struck me funny. It means that the *guerre* will still be on when my speakin' tour is over, as once the Limey subs are washed up, no more transports of doughs can get over. Well, that does not make it so bad. Adoo, Major, and I will send you my newspaper clippings every week. You'll wish before long that a Pinkham was here in your darkest hours as only a Pinkham can—"

Major Garrity missed his tormentor with a full ink bottle. He should have known better than to expect to hit that target. The missile broke up near the door and spilled its contents all over a freshly cleaned tunic that he had draped over the back of a chair.

"Tsk! tsk!" Phineas tsk'd, sticking his head in through the door again, "now look what you went and did! I will not forget the cigar if I can find one in a leper's pocket. Adoo for now!"



"Das Pingham!" yipped Rudolph. "Ach, Fader, where ist der defil?"

—Chaumont, as you may realize, is in quite a dither."

"I can't remember when they weren't," the Old Man pushed out. "Maybe you think I'm not. What do they do but get an idea that one of my best men must go back to the States to—"

"Oh, Pinkham, huh?" interrupted a brigadier, eyes widening. "Why—we—we thought you would like that, Major. In a way it is another disciplinary measure to—teach—Lieutenant—"

"Hah," Garrity laughed like the audience at a Class D vaudeville show, "did those guys ever try to teach a puma not to spit?"

"We came here to discuss the Zeppelin L-72, Garrity," bristled the colonel. "This is perhaps the gravest situation that has arisen—"

"I will talk to the Germans," sputtered the Old Man. "I'll appeal to their better natures. I'll ask them flatly if they think it is fair to blow up submarines. They'll be so ashamed—"

The brigadier got up and motioned to his cronies. "We will waste no more time here," he said majestically. "Don't be surprised, Garrity, if in two weeks you are

(Continued on page 81)

THE Old Man was still apoplectic when the brass hats arrived on the drome. They wanted to hear more about the Heinie Zeppelin which von Sputz had bragged about.

"I told you all I know," the Major moaned. "Do you think I would keep secrets from you? What's the matter with the Intelligence Corps? Did you expect the Heinie to leave blue prints of the job with me—charts and geodetic surveys of the Channel and the location of the Limey subs? Bah, you know all there is to know."

"Now don't get all heated up, Major," growled a colonel. "We expect you to be civil even if you are a C. O. of an air squadron. We thought you might have forgotten something

Diving Bomber vs. Submarine

THRILLING STORY BEHIND MR. MOREY'S COVER PAINTING

* * *

IN a recent issue of Jane's *Fighting Ships*, the companion annual to *All the World's Aircraft*, we find several startling pages of information concerning new and larger submarines being built by several of the great powers. We must remember that one (perhaps really two) of the great naval powers always refuses to curb the building of submarines whenever the question of naval limitations comes up.

The Japanese government has a new Kaigun type sub. They had nine of them in 1932 and were still building them at top speed in the Yokosuka yards. These Kaigun subs are armed with one 4.7" gun, one 3" anti-aircraft gun, and eight 21" torpedo tubes. Their Diesel engines turn out 6,000 b.h.p. designed to speed them at 19 knots. And get this—they have a cruising range of 16,000 miles! This means they can leave Japan, attack a point 8,000 miles away, and return without refueling. (Take a look at your map some time and mark down all the points that happen to be about 8,000 miles away from Japan!)

Then they have the Kawasaki submarines—nine of them at last check-up. These have astounding ranges and in addition each carries a small seaplane with folding wings. The Mitsubishi subs, another type, have a range of 7,000 miles on the surface. The Kaigun subs of smaller size have a cruising range of 11,000 miles.

Great Britain has her famous X1-Cruiser type submarine which has high speed, four 5.2" guns, six 21" torpedo tubes, and several anti-aircraft guns. It's capable of staying below the surface of the water for 2½ days. Her range must be well over 10,000 miles. Then they have their R-Class undersea boats which unlike any other submarine in the world are faster below the water than they are on the surface. They are intended for undersea work against other submarines. Britain's single M-type sub, which carried a folding wing seaplane, was lost and has not been replaced.

The French have nearly 100 modern submarines, including their *Surcouf*, the largest submarine in the world. It carries a small seaplane and the largest guns allowed by the Naval Treaty. It has a cruising range of 10,000 miles. France also boasts thirty of the Redoubtable class which have a thirty-day cruising range. They can leave France, cruise to the West Indies, and return with ease.

Italy has 75 or more submarines, many of them ocean-going (meaning beyond Mediterranean) and deep-dive classes, all with good cruising ranges, 9,000 miles being considered normal.

Since the dread days of the German U-Boats, many startling advances have been made in submarine construction. You'll read here about the modern undersea menace—and how the dive bomber has been developed to combat it.

THAT gives you some idea how far the submarine menace has progressed since the hair-raising days of 1917-18, and while we usually think of a submarine as being only a menace to mercantile marine shipping, we must now consider it in a new role.

The modern submarine undoubtedly can be used in planned attacks against enemy coast-lines. The equipment and armament they carry

is not restricted to surface action against enemy vessels. A 4.7" gun could ruin many a city within a very short time if fired from a submarine that had crept within close range. Moreover, think of the morale effect on the civilian population.

During the war, the only real defense against submarines was the much publicised Q-boat—the vessels that roamed the high seas disguised as tramp steamers. When hailed by a German U-boat, a Q-boat would calmly put off its crew in small boats, giving indication that it had abandoned ship. Then, when the submarine maneuvered in close, hatches would fold away, guns would appear out of a maze of chicken crates, and the unfortunate submarine would be quickly sunk.

BUT what is the modern defense against the submarine? We believe the United States Navy solved the question when it first adopted what is known as airplane dive-bombing. Dive bombing means to attack in a nearly vertical dive, and discharge a torpedo or special bomb directly onto the deck of the target. It requires skill, daring, and a plane that can stand the terrific strain of high speed diving in such an attack.

Should an enemy attempt to make a landing or stage an attack on some coastal city, he would probably make his first thrust by submarine. It will require speed to intercept this form of attack, and that's where the plane comes in.

The Martin dive-bomber shown on our cover is an ideal craft for such work. It can take off from a carrier deck, a catapult, or from a land base—and seek the raider. From a certain height, the observer can spot a submarine under the water. A submarine is a comparatively small vessel, but the accuracy attainable by dive-bombing places the submarine in a serious position. Should the first dive fail to get a direct hit, it is likely that the bomb explosion will nevertheless damage the plates of the submarine and force it to the surface.

The rest of the picture may be seen on our cover. The submarine, leaking and damaged, breaks water and attempts to fight off the dive-bombers.

(Continued on page 86)

THANKS, COMMANDER ROSENDAHL!

YOU all recall our striking June cover painting, depicting the new Zeppelin, *Hindenburg*, speeding majestically over the seas toward America—and also the accompanying descriptive article written by the artist, Mr. Mayshark.

We of FLYING ACES were glad, indeed, to learn that the premier dirigible expert of the United States Navy—Commander C. E. Rosendahl—was pleased by these features. Here's the letter he wrote us—

U. S. Naval Air Station
Lakehurst, N. J.

Mr. C. B. Mayshark,
Care, Flying Aces Magazine,
67 W. 44th St., N.Y.C.

Dear Sir:

I have noted with interest your article in the June issue of *Flying Aces* entitled, "The New Zeppelin Heads for America!"

It is gratifying to note that you have treated the criticisms of lighter-than-air craft in a broad, neutral way.

Yours very truly,

(signed) C. E. Rosendahl, Commander, U.S.N.

Zeppelins Vanish!

The world was utterly dumfounded! First the majestic Brandenburg, queen of the skies—then the Navy dirigible San Diego—and finally the great airship Ludendorff! Every one of those stately Zeppelins had disappeared behind some sinister veil which no man seemed able to pierce. There was a single hope—Kerry Keen must be questioned. But now a new headline blazed from the newspapers. It read: **KERRY KEEN MURDERED!**



HUGO STAARK sat huddled in his office staring into space. His great desk was strewn with papers, blue-prints, and graph charts. Abruptly, he swept them to one side and listened to the compact radio set before him. An announcer chanted—

We interrupt at this time, ladies and gentlemen, to present a Trans-radio flash. It reads: 'The giant airship, Brandenburg, has just left its German hangar for its fifth trans-Atlantic trip to Lakehurst. A full load of passengers is aboard and her commander, Captain Rolf Stresser, predicts a routine crossing.'

Hugo Staark sneered. He glanced up at a map hung on the wall. The Trans-radio flash continued:

For the benefit of the thousands who have made inquiries, we beg to state that there is no further news of the United States Navy dirigible, San Diego, since it so mysteriously left its mooring mast at Lakehurst more than forty-eight hours ago. No information regarding this flight can be obtained, and the Navy Department has shut down on all news concerning it. Relatives of the crew are advised to make inquiries only through the proper government channels. We return you again to the studio.

Hugo Staark chuckled under his breath, glanced at his wrist watch. It was exactly 11:42—and by midnight he was to leave. They would come for him on the dot of midnight. They said they would.

"So the *Brandenburg* left Frankfort-on-Main, eh?" he chuckled to himself. "A routine crossing . . . Very good, von Braun. Very good!"

Then Staark twirled in his seat, listened. There was the sound of motors. He snapped the wave-length lever of another radio set—one built into a bakelite panel behind him. He listened a minute, then took down the transmitter and spoke into it quietly in German. His smile indicated that all was well. Yes, they were coming for him. He could hear the purr of the engine.

He turned to scrape up a few articles from his desk and stuff them into a small leather case. Then suddenly he looked up—and almost leaped out of his seat.

"Himmel! Who are you? Are you Strauben's man?" he gasped. "Where did you come from?"

"Sit down, Staark!" the man before him ordered. "I am not Strauben's man."

Staark had started to rise from his big chair, but now he sat back bewildered. He tried to fathom the strange metallic tone of the voice and the weird cos-



Amid a thunderous cacaphony of ripping fabric and dural, the body of the sleek fighting plane plunged like a monster vaned projectile directly through the side of that mammoth greyhound of the skies!

tume worn by the man who stood before him.

"Who are you?" demanded Staark again in a huskier voice.

"Don't move, Staark," the man in the flying helmet, goggles and black coverall snapped. There was still that strange tonal sound to his voice and Staark stared about hardly certain where it came from. He clutched at the arms of his chair, stared at the piercing eyes behind the goggle lenses.

The tall man in the black coverall and the scarlet mask flipped a small white card onto the desk. Hugo Staark picked it up, stared at the name scrawled upon it.

"The Griffon? What is this business, the Griffon?" the German scientist demanded.

"That's all—just the Griffon," the strange voice said quietly. Then, in a sterner tone: "Where's the *San Diego*, Staark?"

"The *San Diego*? Now that is very funny—the *San Diego*? What do I know about the *San Diego*? I am only the frame specialist here. I am not the U.S. Navy. I supervise the repairs and decide which structural members shall be replaced. But I do not know where the *San Diego* is now. You should ask the government men."

"You lie, Staark!" the voice snapped. "You lie, and you know it! I give you one more chance. Where's the *San Diego*?"

"She took off under sealed orders. I know no more than that."

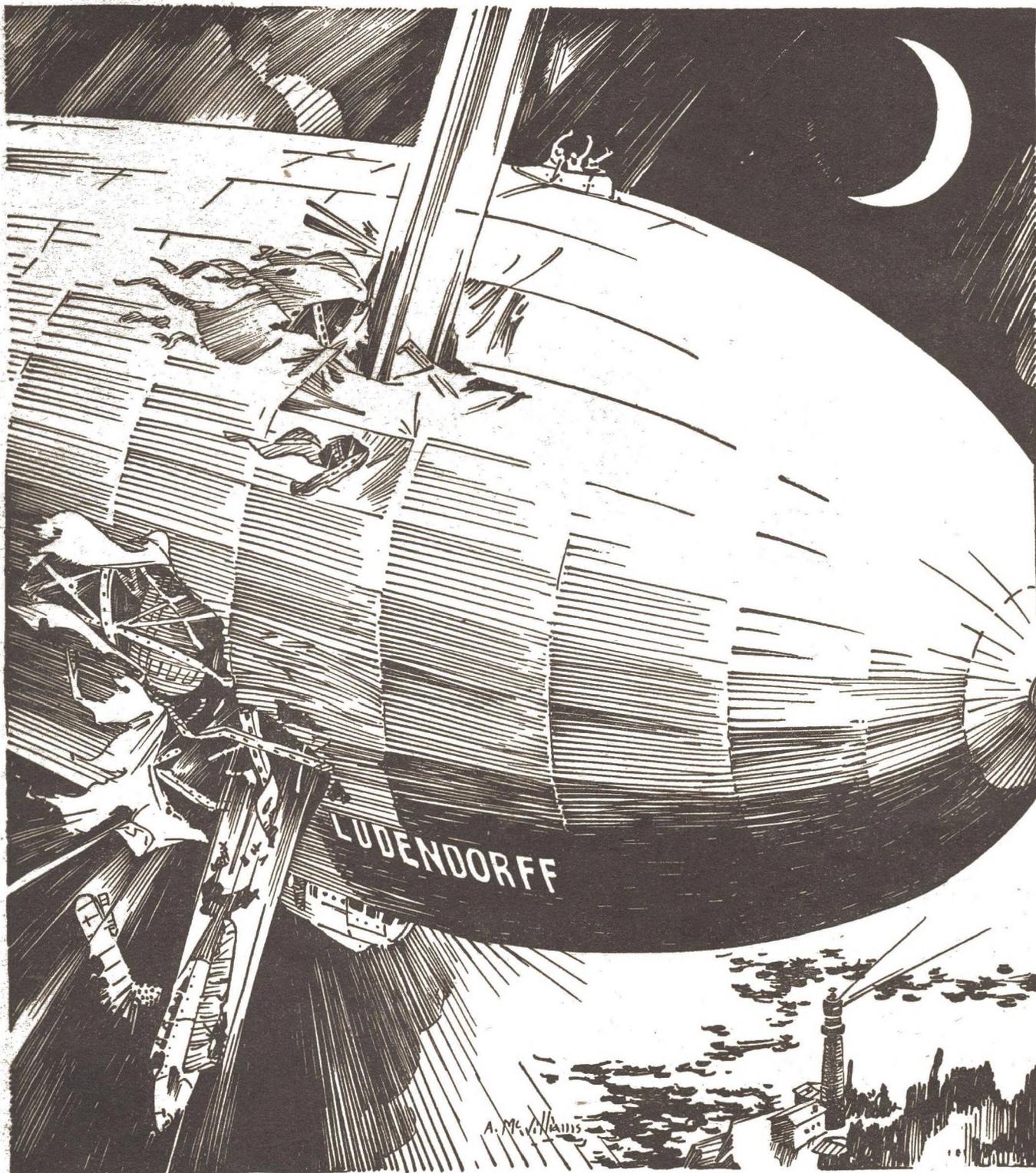
"But yet you are sitting here waiting for someone to come and pick you up in a plane. Where were you going, Staark?"

"You are interfering with my personal business, and

A SMASHING "KERRY KEEN" MYSTERY NOVELET

By Arch Whitehouse

Author of "Death Spans the Pacific," "Sky Gun Snare," etc.



"I beg of you to refer your questions to the station commander," Staark snorted.

"Okay, Staark. You asked for this. I'll let you pick your own way out. Here's a gun."

THE man in black laid a heavy Luger pistol on the table. Hugo Staark stared at it, his great face going the color of dusty parchment.

"What is that?" he asked hollowly.

"For you, Staark. I don't like cold murder. It's for

you to do the job yourself. Go ahead, I'll see that it looks like suicide."

"Suicide? Me? What for?"

"Because you were in on the *San Diego* business, Staark. And you can't get away now. You can save yourself and the United States government an awful lot of trouble by taking that way out. It's not a bad way, from all accounts."

"You mean . . . you ask that I should kill myself?" squealed Staark. "Kill myself . . . what for?"

"Because you know where the *San Diego* is and why she was taken away. Because she's the clue to a plot of some sort. Now, it's either the gun—or the information."

"But . . . but I do not know where she is, I tell you. I can't tell you what I do not know."

"All right; then, it's the gun. Let's get it over with quickly!" snapped the man in the black overall.

"All right. Then it's the gun, eh? The gun it shall be . . . Mister . . . Mister Griffon. The gun it shall be."

Hugo Staark reached over, carefully picked up the black weapon. He thumbed the catch, stared down at its machined breech.

"The Griffon, eh? I think I have heard about you. You're quite a character in your way. I was advised to be on the watch for you, but I never thought it would be as easy as this."

And with that Hugo Staark quickly levelled the gun at the man in black and pulled the trigger twice. He would have pulled it three times—only Hugo Staark was dead by that time. A low plop followed the first pull and a small jet of vapor spat out of the rear of the breech. The second pull was nothing more than muscular reaction.

Hugo Staark lay back in his chair, a strange smile across his face. His fingers still clutched the white card.

The man known as The Griffon stepped up with a cold smirk, carefully removed the weapon from Staark's fingers, and stepped back.

"Another man who thought all guns fire forward," he said quietly. He then scooped up a few papers, ripped a small map off the wall, jotted down the wave-length registered on the dials of the transmitting set behind Staark's chair, and disappeared into the night outside.

He made his way cautiously across the open space before the big Lakehurst hangar, skirted the rails of the mobile mooring mast, and hurried to a black, low-wing amphibian snuggled in the shadows.

"That you, Ginsberg?" a voice came from the cockpit.

"Okay, Pulski," the man in black answered, running up. "Let's be moving."

"How'd it work?"

"How has it always worked?" the man in black said.

"Swell—the louse!"

"And now we're going to have some fun, if I know my onions," the man in black smirked. "And I'll say I'm glad to get that gas-mask attachment off. Damned helmet is heavy enough as it is."

"All serene back here," the man known as Pulski reported.

The man in black took the pilot's cockpit, snapped the switch, and depressed the starter. The big 1,000 h.p. Avia motor opened up with a dull purr. The pilot had seen to it that the Skoda mufflers were cut in before he started her and now she was ticking over no louder than an expensive motor car. He checked everything, then gave the motor the gun. The ship raced away and climbed with a low wailing moan toward Toms River and Barnegat Bay. In a few minutes they were at 6,000 racing along toward the long gnarled finger of Sandy Hook.

The man in black turned once, snapped on the radio set, then carefully set the wave-length lever to a number he had taken from Hugo Staark's set.

Now he took the hand mike and began calling in a guttural tone:

"You, Strauben . . . You, Strauben. Where are you? I can't wait much longer. Where are you? Give me your map position."

In a moment came a reply:

"Hold on, *Herr* Staark. We are coming fast. We are now over position . . . er . . . over W-16-1. Got that, W-16-1?"

"All right, I'll give you ten minutes more. W-16-1, eh? That's good."

The man in black plucked up the small map he had taken from Staark's desk, glanced at it carefully. It was an ordinary Hammond auto map—but it had been squared off with a ruling pen with the squares carefully marked in much the same manner as war-time ordinance-survey maps. It was a clever idea, for it allowed the open transmission of map points without actually allowing accidental hearers to know just what point was being mentioned. The man in black was glad he had picked that small road map up.

He glanced at it again and decided that the man who had answered to the name of Strauben was somewhere over New Brunswick.

He shoved the map over to the man in the rear portion of the pit and said: "Look for a guy over there—and don't miss!"

THEY swerved sharply to the left, shot across Monmouth Beach, and cut in again at high speed. They sat tense and scoured the sky above and the ground below for traces of their prey. They reached Keyport and then the man in the rear slapped the pilot on the shoulder and yelled:

"Over there toward the river. I just saw him slash through the light that flickers up off the water. Go get him!"

The black pilot swung over hard and hoiked the speed to more than 300 m.p.h. The black amphibian, its pontoons folded snug into slots in the deep body, was "all out" now both flyers tensed in readiness to nail their unknown enemy.

"What's she like?" the Griffon asked.

"Low-wing job, something like a Junkers bomber-fighter. You'll have to hit hard and snappy. They're probably loaded down with guns."

"How the deuce did they expect to get into Lakehurst with that?"

"You can do anything—if you do it fast enough. What have they got to lose? There ain't a real service plane within a hundred miles of Lakehurst. A few old National Guard crocks at Newark, but that's about all."

"Guess you're right. Hell-1-1-1-o! Good night!"

Before the Griffon could realize what he was up against, the Black Bullet had hurled them into the range of the mysterious silver monoplane fighter below them. From three turrets spurts of fire slapped up at them and the Black Bullet resounded with the thumping.

Like a shot, the Griffon wheeled over and slipped clear just as three low coughing bursts splashed shrapnel across the sky. The shots were from the muzzle of a quick-firing 37 mm. gun mounted somewhere in the nose of the two-engine Junkers.

"Whew! We certainly picked one this time," the Griffon yelled. "You'd better do something fast, Pulski."

But the man in the back was already doing plenty. He unshipped a set of double, high-speed Brownings and was snapping short bursts at the silver Junkers below and making the pilot swing his ship about so madly that it was almost impossible for his own gunners to draw a clean bead. The man in the back of the Griffon's bus kept this up for several minutes until the Griffon was ready for his thrust. The enemy plane tried to hold off the inevitable with frantic bursts from the heavy air cannon, but they were all off balance and their shots



were futile, going far wide of their mark.

Then with a sudden lurch, the Griffon feinted a dive at the Junkers' tail. His gunner played a merry staccato tune on the Brownings and made the Junkers twist off. Then the Griffon hammered a terrific blast full broadside into the Junkers.

They saw the pilot frantically attempt to jerk her clear. Then a burst from the Black Bullet's rear guns cut him down with deadly precision. His hands came up and he twisted in agony as another charge from the Griffon's front guns bashed into his side.

A man abruptly clambered up over the gun mounting of the Junkers and hurled himself clear. Pulski took aim—then withheld his fire. The man disappeared for a moment, then they saw his white silken canopy blossom out below.

Some one was still sticking to the ship in spite of the hopelessness of the task. But Pulski picked him off with a short burst as the Griffon swept over the floundering ship. There came a loud report, a puff of smoke, and a belch of flame—and the massive Junkers was finished. They watched it curl over, then spin, and finally wind up in a plume of flame.

The Black Bullet turned away and headed for Staten Island.

WELL after midnight, a long black car crept down 54th Street twenty-four hours after the silver Junkers had been shot down over South River. The driver's long face and deep upper lip indicated his Celtic background. He eased to a stop, and his passenger slipped out of the rear door, darted up a grubby set of front steps, knocked once, and twisted the knob. Inside, a man hurried forward from a dimly-lit room, holding a scraggy corn-cob pipe in one hand. He peered anxiously at the newcomer and then grinned broadly. He then took a shapeless parcel from the visitor in trim dinner clothes who faced him.

"All right, Pat," the man in the dinner coat nodded. "Keep your eyes and ears open for about fifteen minutes—and then go back to sleep. You'll be able to read all about it in the morning."

And with that the man in the dinner coat darted up the building's four flights of stairs. He came to a slim ladder that reached up to the skylight. Now he took more care. The skylight opened easily. He stepped out onto the roof and hurried behind some sooty chimneys.

Now he glanced across the space that separated the old tenement upon which he stood from the more modern apartment building on 55th Street. He listened carefully again, then hurried along the buttress of the roof, finally coming to a halt near one corner.

His hands fumbled in the shadows for several seconds, then came out with what appeared to be the stranded wire of a radio aerial lead-in wire. He loosened it from a white porcelain, then took out a pair of soft leather gloves.

He pulled on the gloves, gripped the steel wire at a point carefully marked with a dab of white paint, then casually climbed up on the roof buttress and placed his toes carefully on a black mark that had been painted there. He drew the pseudo lead-in wire tight and assured himself that it was strongly connected with a heavier steel cable above him that stretched between the two buildings to simulate an aerial wire. Now he drew the wire tight and swished off into space, the steel wire above him twanging under his weight. His body swung down, then up again, landing him on a corner of the building which faced on 55th Street. Here, after steadying himself, he fastened the swing wire to another inoffensive white porcelain. Then slipping the gloves into a depression between the wall and the fire escape, he carefully climbed some steel fire-escape steps

until he reached the main roof from where he could inspect the pent-house apartment.

From there he tiptoed across the pebbled roofing, fitting a mask to the upper portion of his face as he walked. Then, tugging the snap brim of his black felt hat down a trifle, he selected a window.

He raised it without difficulty, threw his foot over the sill, and slipped through into a neat and comfortable bedroom. He moved like a panther. His hand soon found a door-knob. He held it for a few seconds, listening intently. Then drawing a small black pistol from his inside pocket he drew the door open carefully and hurried along the narrow corridor beyond.

Coming to the studio and noticing a light within, the man with the gun peered through and saw a man in dinner clothes with a scarlet mask over his face. The man sat at a desk, facing a door on the opposite side of the room. In his hand he had a gun.



His hand twitched. He appeared to be listening intently. His eyes drew into narrow slits as he peered about the room through the openings in his mask. Then suddenly he stiffened—but before he could make a full turn, a shot cracked out from the narrow corridor behind him. He let out a gasp, fired twice, then felt his gun being knocked out of his hand. He

tried to get to his feet but only let out a choking gasp and fell with a smash on his face.

The man in the black felt hat had darted into the light, had knocked the gun from the man's trembling fingers, and had swiftly placed it on two prongs that protruded from a velvet covered panel over the desk. It fitted in perfectly with the general arrangement of modern and ancient weapons. Then with a quick movement he went through the dead man's pockets and extracted several papers and notebooks. Finally, he swiftly darted back into the bedroom, and slipped out of the window. In three minutes he was swinging back to the dingy tenement on 54th Street.

And he was right, the old bewhiskered caretaker *did* read all about it the next morning.

IT was 9 o'clock and Drury Lang was mighty tired. He had been up all night on the 55th Street case. Outside, the newsies were still screaming their wares. There was much in the news!

There was still no trace of the *San Diego*, and the great German airship, *Brandenberg*, which had left Frankfort-on-Main thirty-six hours before, had not been heard of since she had passed over the English Channel a few hours after she had left her German base.

Then there was the murder of Hugo Staark, the noted German scientist who had been working with the U. S. Navy lighter-than-air experts in the re-fitting of the *San Diego* and in planning of the two new naval dirigibles that were being assembled in the new Lakehurst hangar. The only clue they had to that murder was the Griffon card found clutched in Staark's fingers.

They had never seen a man who had died exactly like that. He apparently had been strangled—but there were no bruises or other marks on his throat. A superficial autopsy had not disclosed the cause of death although the Ocean County Coroner was convinced that the German scientist had met his end by foul play. Federal investigators were of the opinion that he had met his end while experimenting with some sort of a lifting gas. It

(Continued on page 72)

Sky Flicker Cocardes

A BANG-UP YARN ABOUT MOVIE CRATE CRASHERS

By A. R. Elrod

Author of "Pilots and Pirates"

A FAKE? That's where you bozos are wrong. It makes me weary all over to hear you movie fans snort "fake!" when a hard working stunt flier dices with the only life he's got to put over a thrill in a flicker.

How are you going to show a German bomber crashing into an American combat crate and going down in flames and get by with it—if it isn't the real show? No sir, that air fight scene in the picture you're talking about wouldn't fool the dumbest palooka in Kokomo if it was faked with miniatures.

All right, I'll prove it. I'll unbuckle the yarn, partly because the beer's good here and partly because it's only fair to give the boys in the crash and carry business a little credit.

Skeet—well, we'll forget the rest of his name—was the crash artist in that bomber. Another stunt flier named Karl handled the joy stick in the combat plane. And here's the lowdown: A third chap that you couldn't see was in that big Gotha bomber, working the smoke pots. And when that bomber splattered itself all over the orange grove—

But wait a moment. Before I tell you what happened I've got to go back to where the yarn really starts.

That was when a bunch of us inexperienced dimwits slipped across to fight the Kaiser and make the world safe for democracy. If you'd told me then that I was going to wind up as a press agent on a movie lot, I'd have hung a porthole around your neck without opening the port.

Skeet and I wound up in the same pursuit squadron, along with a half dozen other youngsters all fitted out with wings on their chests. Most of 'em finished up with wings on their backs.

Our field was located about five miles behind the front in the Pont-a-Mousson region, and there was plenty to do up there. If we weren't all brave little angels from Hades, it wasn't our fault. We hadn't seen the war movies yet.

Skeet and I shared a cubicle in a flimsy old barracks once used by a French Spad outfit. In those days Skeet was full of ambition and just as pesky. He was always grinning at some secret joke, always thumbing his freckled nose at trouble. And fly? Why, Skeet could pounce on a Jerry, draw blood, and buzz away just as nonchalant as one of those New Jersey variety mosquitoes working on a summer boarder on a dark night.

And to carry it further, if I may—and who's going to stop me?—Skeet could fly better in the dark than he could in the day. That's how the whole thing started.

All of a sudden one night the little electric light in our cubicle flashed off. Skeet had been stringing a guitar, and I put my foot through it when we both jumped up and ran out, all excited.

"It's a raid!" Skeet yelled.

"And it's your fault," I swore. "If you and the major hadn't gone out to lay eggs on that munition dump last night—"

But there's no use talking to somebody that's run off and left you. Flaming onions were now shooting up over the lines. In between the thudding of the archie guns I could hear the drone of motors.

Something like a great black moth was flitting under the moon. Those Jerries must have been pretty mad about our bombing expedition the night before, or they wouldn't have picked a cloudless night for the comeback.

The black shape loomed up with a roar. It was evidently heading for the village that lay a few kilos behind us. Flying low to keep track of landmarks, it howled over our dark drome and faded away. I didn't doubt for a minute that they'd drop a few mementoes on us going back.

Somebody came running toward me.

"The major says we can go," Skeet panted. "Step on it, Jimmy!"

THEY had our ships warming up in a jiffy. Those mechanics always hurried at the wrong times. Well, I didn't want to try to find Skeet, among a bunch of stars, so I climbed into the office of my Spad and gave her the gun. I could see cherry red streaks coming from the exhausts of Skeet's bus as it bumped down the field.

We streaked for the town where that Gotha was headed, and in a few minutes I saw searchlights criss-crossing in the sky just like accusing fingers wagging at that Gotha. Then, down on the horizon, a big blot of red popped out.

Coming at the rate of more than a mile a minute made that red spot expand and grow until it was right under us. The Heinie bomb had landed near an important storehouse on the edge of the

little French burg. And Jerry was coming back to try for a better aim.

Skeet went zipping down to head the Gotha off, and I figured my play was for the bomber's tail. That Gotha looked like the Leviathan coming into its slip. I tell you, those were big babies! And there was nothing helpless about 'em, either. The Gotha began to spit red out of its nose. A second later I was diving for the tail, and there was a stinger there, too. In the moonlight I could see the rear gunner swing his stick in a hurry, and pepper away.

That didn't bother me. I reached for the trips and held the dive. Zing, zing, went the sparklets. Now I was off to the side, so I nudged the rudder bar. Too far. And then my prop seemed to explode.

Just went all to pieces. I thought the motor would

No, the Big Sky Scrap didn't end in '18—it simply moved over to Hollywood. It was there that Skeet found himself slated to fight the war all over again. And when those crates again dog-fought their way through the skies, the leading character of the "first show" flew with them—a character whom the casting director hadn't even signed. His name was—Death.

shake itself loose before I could cut the contact. I was still going hell bent for the Gotha, pulling back a bit on the stick, and I took another look at the gunner. He had disappeared.

The thought came to me that he'd ducked into the fuselage. That struck me funny, because my guns wouldn't work any more. I didn't know 'til later that I'd got him plumb center.

Anyway, I was out of it. The thing to do was pick a pretty daisy patch and curl up. The Gotha was plowing right along, regardless, and I took my mind off my own troubles long enough to look around for Skeet. Apparently his last dive had taken him too low.

But that kid wasn't out of it. Silver flashed on his wings, as the ground boys tossed up a star shell. Then, like a rocket, Skeets hurled his Spad up that bullet-ridden sky. Just short of the belly of that roaring Gotha, he skilfully curled over and let loose with twin streams of withering lead.

Even so, what could he do against that battleship? He didn't have a prayer. I gave up hoping and tried not to look, but I stretched my glide just the same, following. The

sound of his motor and the pounding of the Gotha's twin power plants seemed terribly loud after my own had gone dead. I couldn't hear the machine guns, but the red flashes were plain.

And then that huge black bird flopped over on one wing! He'd turned 'em back! No, I was wrong. The Gotha leveled off, loggily. But then it slipped off on the other side. Skeet came howling along over me like a comet chasing its tail, standing on one ear as he returned to the attack. This time I could hear the stutter of his guns.

The Gotha was done. Those side slips brought it down faster than I had dropped, and I banked a little. Then I noticed that the prop had taken away a strut, and my right wing was fluttering. I wasted no more time reaching down for an anchor.

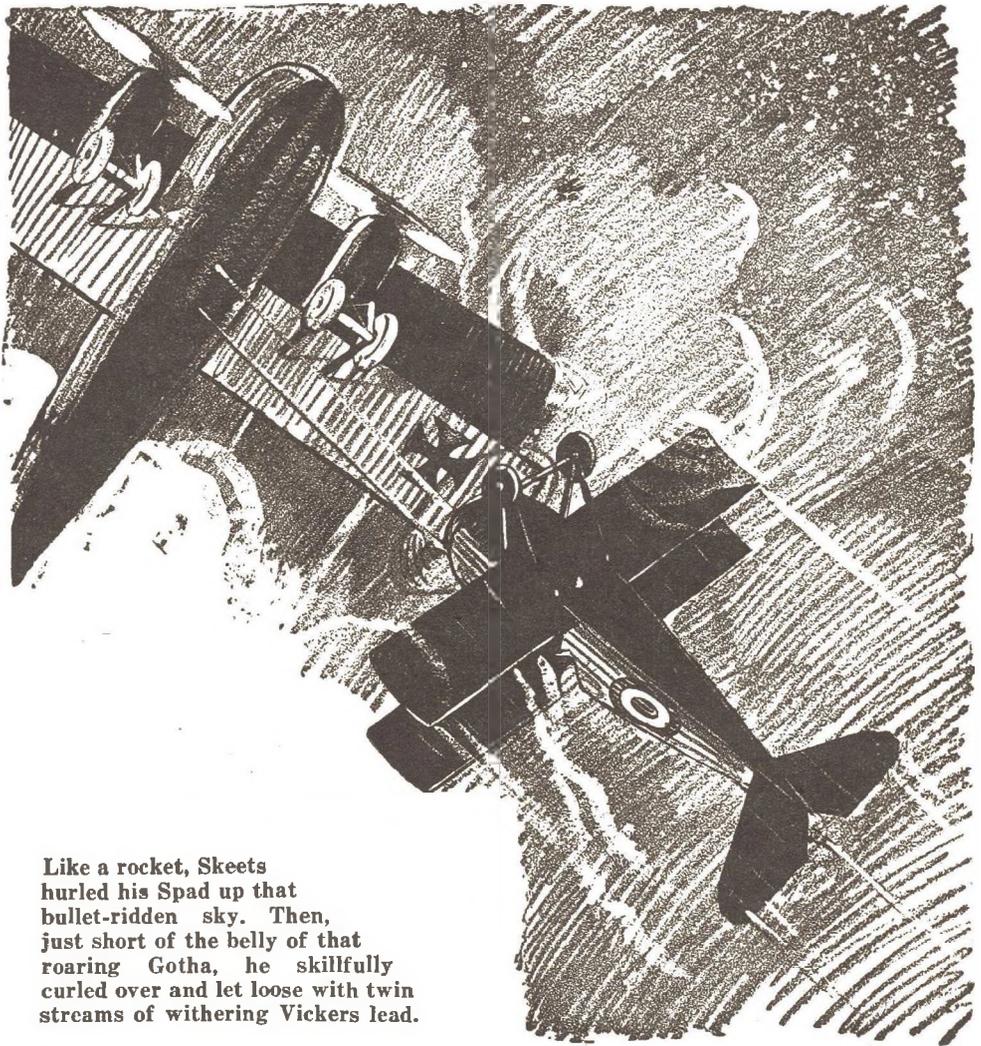
That was one crack-up that I walked away from. I got this stiff leg later, but that has nothing to do with the story of Skeet.

Anyway, there was the meadow and I took it to my arms like a brother. The Gotha came down no more than fifty yards away, and I began to feel around for my automatic. I didn't know just what I'd do with it.

Then Skeet came down, motor popping like a Fourth of July celebration. He set his crate down so easy that the moonlit shadow seemed just to melt into his bus. I climbed out and began to run toward the Gotha. So did Skeet. We got there at the same time.

IT was an ungodly looking mess. The great wheels were spraddled flat. A man hung, arms down, from the gun pit that sticks out in front of the wings. I could see something dripping from his hands.

Skeet climbed onto the lower wing. I saw a big, dark-



Like a rocket, Skeets hurled his Spad up that bullet-ridden sky. Then, just short of the belly of that roaring Gotha, he skillfully curled over and let loose with twin streams of withering Vickers lead.

headed German trying to raise a Luger, and Skeet dashed it away. The pilot let go the gun and fell back.

I helped Skeet pull the fellow out and we stretched him onto the ground. Both of us were shaking so we could hardly hang onto the man. We had him there, the moonlight white in his face, when he tried to sit up. He looked at us, and his teeth bared. I never hope to see so much hate in a man's eyes again.

He looked past us, and saw that figure hanging from the forward gun pit. The shudder that went over his frame shook him out of my grasp. He tried to raise his hands, clawlike, to grab Skeet, but bullets had got him through both arms.

"Gott! You—you have killed my *brudder!*" he moaned.

Skeet grunted as if he had been hit in the belt. It was weird, ghastly. To have killed these men, that was bad enough for young punks like Skeet and me. But to have 'em speak our lingo, that was worse. And the way he said "brother" made him seem like a pitiful kid.

The breath seemed to be catching in little lumps along my gullet. I looked at Skeet and saw tears shine on his cheeks.

Soft? Maybe. I get sick in the pit when I think of it. But remember that the young lads who flipped those flying cheese boxes and flying coffins around in France, and yes, spattered themselves on the soil, weren't such hardboiled buckos. A dog fight with a circus of German *aviatiks* was sport, fast and furious, and soon ended one way or the other. But it was different to come face to face with a man bleeding from your slugs, and for the first time get a close up of what war really is.

Cars came chugging across the meadow, followed by every one who could limp or stagger out of the village.

Skeet and I lifted the wounded flier into an ambulance and rode with him to a base hospital.

And there you have human nature in its nutshell. Let an enemy guy kill your compatriots, and you double up your fists and make your gums sore gnashing your teeth to get at him. And yet when you've got him down, you feel sorry for him, and repent, and go rushing around looking for a glass of water and a rag to wipe his face!

Skeet took it harder than most of us. I got over the feeling as soon as I was scooting back to the drome. But Skeet moped. He didn't even get sore at me when he found that I'd stepped through his guitar.

I don't mean his hair turned gray or his cherubic face took on wrinkles. But you could see the difference in his eyes, and most of all I missed that tuneless little whistle of his. Every chance he got he'd go to the hospital with something for the flier whose brother he had killed. The German's name was Karl, and he had lived in Brooklyn for a few years when he was a kid.

Well, let's have another tall one. I've been so busy telling all this, that I've got to catch up with the rest of you.

ANYWAY, Skeet and I survived. As for me, I found that some part of my personality had been burned into a little crisp by that hell over there. I couldn't settle down, fall in love, or pass up a drink. Everything was just destiny—that was my slant on life.

But Skeet, he just seemed a little more sober faced, a little less happy-go-lucky. He went through all the motions of forgetting about the war, except he didn't get married. He took it easy for a couple of years in California, and I didn't hear from him for months at a time. His patience gave out, I guess; or else Uncle Sam got weary of chasing down my forwarding addresses.

In the meantime, I got together a barnstorming outfit—two crates, a mechanic, and Slim Porter for a companion in recklessness. We did a little wing walking until Slim stepped in the wrong place during the Fair at Indianapolis.

Then I heard Skeet was on my trail. I sent him a wire, and he told me to come on out to Hollywood, where there was a place for a few good stunt fliers. The place for a stunt flier, brother, is on terra firma—and, as Sambo said in that old weeze, the firma the bettah.

So here was Skeet, big as life—and he was whistling again. We partied around for a week with the picture crowd before I found out what had brought Skeet back to himself. Finally it came out. He had squared himself. Yep. Somehow or other, he'd run into that German flyer, Karl, who was starving or broke or something, and he'd found him a swell berth flying for one of the picture companies. And Karl had told him that by-gones were hasbeens.

"You see, Jimmy," Skeet explained, as if worried I wouldn't savvy, "Karl and I weren't really enemies. It's the big shots that make wars—those old fussbritches that pull their beards and say, 'let's let the kids fight it out for us.' No, Karl don't hold any hard feelings toward me. The war is over."

The war is over!

There's a gag for you! That's one that will panic 'em in the sticks! Brother, the war won't be over for us until they rattle the pebbles on our coffin lids.

Well, to get on. Skeet and I and Karl had good pay and soft berths, like hanging by our teeth from the undercarriage, falling into space with chutes under our jackets, and crashing old clunks just to see how many pieces could be separated from a plane with us still living to count 'em.

Then my old hip wound began to act up, and I had to quit shoving rudder bars. Skeet pulled strings and saw to it that somebody's uncle told another fellow's cousin that I was a born press agent. I got the job.

We had some grand times. All good flyers land in Hollywood sometime before they die, and there was always whoopee to be made in honor of the visitors.

AND then Gretchen Heyward came along! That's her real name. She uses another tag out on the screen, so I'm telling no secrets.

She was a pretty little thing, blonde, but not too blonde, and her eyes were blue, but not too—well, anyhow Gretchen got a year's contract. The studio didn't know where they'd use her, but she was too pretty to be left around for somebody else to grab.

If Skeet hadn't been so girl shy she'd have got a contract from him, too, one that reads "holy wedlock" somewhere among the clauses. But as I say, Skeet was girl shy, like a miser at a night club. It was plain to all of us that Gretchen had fallen for Skeet, but that flying fool never took a tumble. You know, when a girl starts passing up free dinner dates at the Ambassador just to eat ham-and with a guy at a studio cafe, boys, she's in love.

I found Skeet and Gretchen off in a corner of the eat shop on the lot one noon, having an argument. And just out of curiosity I horned in at their table. I figured on learning something new in feminine tactics of war, because I like to improve my own methods of offense and defense. And I suppose it's always a good move for a girl to start a fight with her fellow if she's 'that way' about him and wants to find out where things stand.

"I won't have it!" Gretchen was saying stoutly. "That stunt's too dangerous, Skeet. You must promise me you'll not try it!"

"Well, I can't back out," Skeet protested, sort of flustered.

I thinks to myself that Gretchen is letting herself in for a counter attack. A little skirmish is all right to get the lay of things, but she was picking herself out a battle. What I mean!

"What's this stunt I hear being bandied about?" I asks, pleasantly.

Skeet looked at me as if I was the first million Yanks reporting for duty to Marshal Foch.

"You tell her, Jimmy," he implored. "A stunt man can't get his wind up over a little thing like crashing that Gotha, can he? How would it look if I turned Jackson down now?"

Skeet was referring to one of the grandstand plays scheduled in the filming of Jay Jackson's war movie. It was the usual stuff—a lot of dogfights and crack-ups. But the big stunt was a tough assignment, and Gretchen had a right to worry about it.

You see, Jackson had it doped out that a big German bomber was to be shown getting the worst of it from an American pilot in a pursuit plane. He wanted the Gotha to go down in flames, and end in a grand slam.

Of course they weren't going to be real flames, and the pilot would bail out long before the bomber was crushed to the breast of Mother Earth. But putting a big Gotha into a nose dive and cracking it up to the satisfaction of a morbid minded, sadistic-souled movie director is no soft snap.

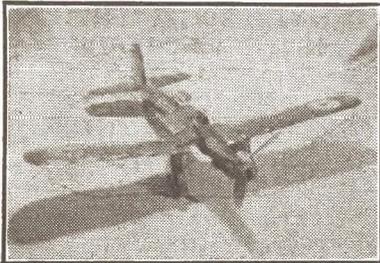
"Sister," I said to Gretchen—and I spoke bluntly in

(Continued on page 86)

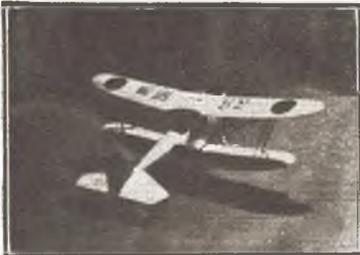


Hats Off to the Japs!

* * *



First off, those Nipponese evidently like our Curtiss A-3 Attack ship—for here we see a mighty natty model of the famous American machine. It's a flying model that boasts fine cowling and gun-pit detail. Note the three-bladed prop.



Here we see a Japanese Nakajima 90 Navy shipboard fighter built over there in Tokyo by a fellow named Kitamura. It shows clean workmanship. The real "90" is an all-metal, Jupiter-powered job.



And now meet Mr. Suzuki. He's holding his model of a Jap Kawasaki 92, the Army single-seater fighter which mounts the 450 h.p. B.M.W. Too bad this isn't a movie—for he's about to let 'er fly, and we'd like to see 'er take the air!

DID you think that the boys of America, Britain, and the other Western countries had this model aircraft game tied up? Well, if you did, you have another guess coming! Just develop any kind of an activity—and if it's good, you can bet your boots those quick-thinking young fellows in Japan will get in on it, too! And in a big way!

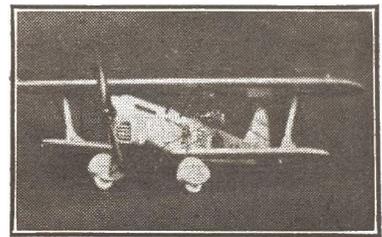
After you've taken a good look at the various model photos on this page, you'll echo our headline, "Hats Off to the Japs!" They're certainly no slow pokes at the miniature aircraft art. We of FLYING ACES were so impressed with their work that we're presenting this page up here in the front of the book as a special feature.

The photographs shown are only a selected few of many "shots" sent us by Mr. Suzuki, of the Tokyo Mokei Hikoki Kenkyukai, a leading Japanese model supply firm. The company is located at No. 5, 1-Chome Kobikicho, Kyobashiku, Tokyo—if any of you fellows are interested. Boys in the Tokyo Model Airplane Club made the models pictured here. You'll note that they like American and French ships as well as craft of their own services.

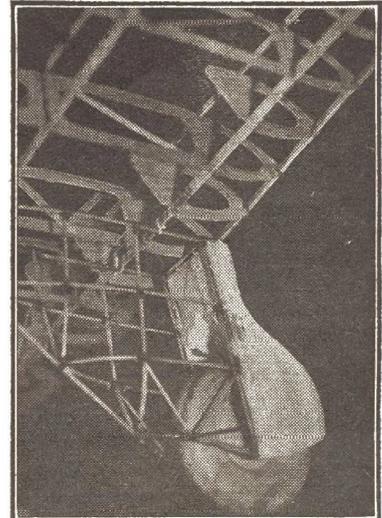
We believe that all these models show exacting and painstaking effort on the part of these Oriental builders, and we are therefore more than happy to present these excellent camera views showing the fine workmanship of the Japanese builders.



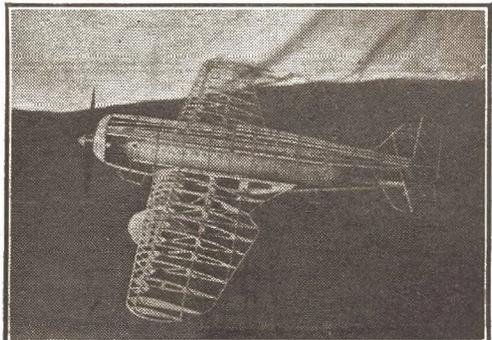
How's this for a neat Dewoitine! This Nippon-made model of the striking French ship is not only true in detail, but is also one of the best finishing jobs we've seen.



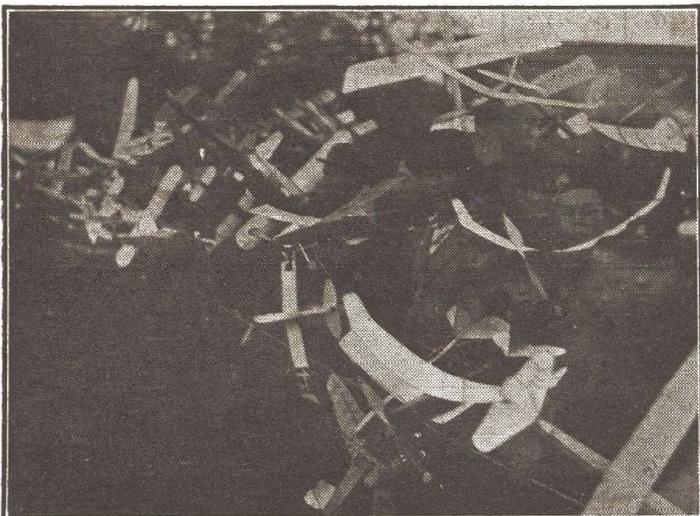
This splendid model, made by Kitamura, is also an eye-filler. It's a replica of the Kawasaki 93 Army day bomber, a 600 h.p. B.M.W. powered ship. The Jap secret list keeps us from knowing how good the "93" is—but it must be tops if it's as good as this model!



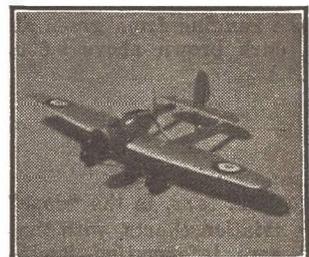
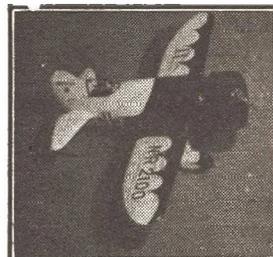
One of the Japanese modelers took time out to photograph the framework of his stressed undercarriage. You beginners can learn a lot from this interesting "shot." Note the details of the wing structure and of the wheel spat layout. (See full ship below.)



The skeletal structure of a decidedly interesting model—a compressed air job. Note how the tank is incorporated in the ship. Plenty of painstaking work went into this one! (Also see photo above.)



Models? We'll say they have 'em—and how! In fact, there seem to be so many that they have to hold 'em back with a rope! This photo was snapped on the occasion of a big model meet in Hibiya Park, Tokyo. Everybody and his brother seems to be on hand.



Left: Another Yank job that goes over big with the Japs—the speedy Gee-Bee. Certainly swell detail here! Right: A neat solid model of the French Hanriot pusher fighter. In the replica field, those Orientals rate with the best!

ACE MCCOY

SIMPLIFIED AVIGATION

CHART READING



TO be a good avigator, a flyer must know his maps forwards and backwards. On an aeronautical chart, the various features are divided into three main groupings—*Water*, *Culture*, and *Relief*. The water features are printed in blue; the culture features are printed most prominently in black; and the relief features are printed most prominently in brown.

LARGE RIVER		DRY LAKE	
INTERMITTENT STREAM		MARSH	
INTERMITTENT LAKE		GLACIER	

WATER FEATURES (PRINTED IN BLUE)

CITIES AND TOWNS		LESS THAN 1,000
		1000 TO 5000
		MORE THAN 5000
PROMINENT HIGHWAYS		
SECONDARY HIGHWAYS		
RAILROAD ONE TRACK		
TWO OR MORE TRACKS		
ABANDONED		
ELECTRIC		
TUNNEL		

RACE TRACK	
TRANSMISSION LINE	
OIL WELL DERRICK	
OIL TANKS	
LOOKOUT TOWER	
FOREST RANGER STATION	
QUARRY OR MINE	
COAST GUARD STATION	
MISCELLANEOUS LANDMARK	

White dome

CULTURE FEATURES
TOWNS, highways, railway tracks, and other man-made configurations are those which are termed culture features. As stated above, they are most commonly given in black, though purple is also used. Towns from 1,000 to 5,000 in population are an exception, being printed in a yellow square. These squares, however, are outlined in purple. Heavy purple lines, moreover, are employed to represent prominent highways.

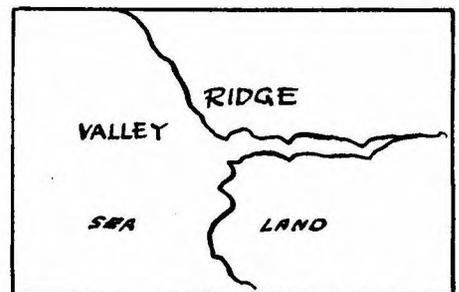
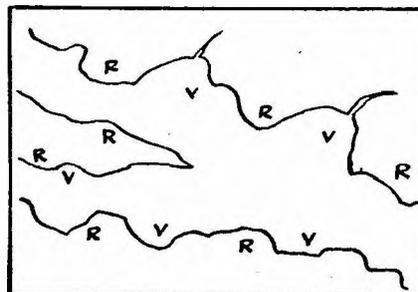
When caught in bad weather, an expert chart flyer is readily able to "spot" his position when coming out of the "soup" by checking the cultural features below him with those printed on his map. (Note the various culture features reproduced on the left.)

RELIEF FEATURES

A FLYER gauges the relief features below him by checking the brown contour lines on his aero chart. Contour lines are marked with figures which indicate the elevation they represent. Thus, if a contour line reads "4,500," it means that every point along the line is 4,500 ft. above sea level. In a mountainous region, a pilot must check his contours carefully to make sure he is flying at a safe altitude. Relief features on a chart are also emphasized by a series of graded tints ranging from green at sea level to dark brown above 9,000 ft. (See left.)

GRADIENT OF ELEVATIONS

GREEN	LIGHT GREEN	PALE BROWN	LIGHT BROWN	MEDIUM BROWN	DEEP BROWN	DARK BROWN
0	1000	2000	3000	5000	7000	9000
HATCHURED PEAK WITH ELEVATION				MOUNTAIN PASS WITH ELEVATION		
3 FOOT DEPTH CURVE				SAND DUNES		



THAT, fans, is the "dope" on your aviation charts, with the exception of aero information itself—beacons, airports, emergency landing fields, and the like. All these are printed in red. We'll explain them for you next month.

Left above: Ridges and valleys as shown on the charts ("R" the ridges, and "V" the valleys)
Right: The seashore as a contour. The sea is in the valley.

All Questions Answered

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

John Calvin, Cleveland, Ohio:—Most airliners in this country have a system of controlled heating and ventilation. The heating in most cases is drawn from the exhausts of the motors or accomplished by special electrical equipment. The Douglas has a steam-heating system. Maps showing the air lines of the country are available at the Department of Commerce, Washington, D. C.

Tommy O'Toole, Newark, N. J.:—The four-bladed props give a more even torque to a motor, and so are often used on motors mounted on test benches. A gallon of gasoline averages about 6 lbs. in weight. Thanks for your nice words on our magazine.

Howard Wantanabe, Brigham City, Utah:—Why are there so many unemployed transport pilots? Well, while we are supposed to be an air minded nation, actually only about three per cent of the people are willing to fly on commercial air lines. Now if you can overcome this fear, and induce hundreds of your friends to fly whenever possible, you will soon overcome this unfortunate condition. I would not care to make any statement concerning the school you mention.

Jerome Klausner, Brooklyn:—We know nothing about the Boeing XF6B-1 which was supposed to have been taken over by the Navy. It's probably still under inspection. The speed of the Delta is 223 m.p.h. The Gamma does 224. I have no authentic figure on the "Swoop," and the Waco ships have so many classifications it is hard to set any special speed figures on them. The Vickers is probably the best stationary gun, and the Browning and the new Bren are probably tops as movable guns.

Stanley Michaelson, Long Island City:—Howard Hughes made his West-to-East run in a special Northrop powered with a 925 h.p. Wright Cyclone engine.

Donald Eugene Woidke:—Your long letter was very interesting, but your points of comparison show a lack of understanding of the types involved. To compare the Fury with the P-26 is silly and to compare the XP3Y-1 with the Perth is even sillier. The Perth is not a long-distance flying boat, it is an anti-submarine job intended only as a steady air platform for air cannon use over the North Sea. There is nothing particularly new about the Douglas design. There were commercial monoplanes as far back as the early 1920's

built by Junkers, Bleriot, and others long before the present Douglas commercial ship was even considered. There's nothing really new about a two-engined, low-wing monoplane, and if you must make service ship comparisons it would be better, and far fairer, to consider contemporary machines. Don't compare a foreign machine that has been on active service for two or three years with something that is still in the experimental stage. The Demon, for instance, is practically obsolete while the SBU-1 is a brand new job hardly in squadron service as yet. Howard Mingos, an American expert writing in the latest issue of the Aircraft Year Book, states that the United States now stands fifth in the world's air powers. I agree with you that American engines are among the best in the world, but I still claim that the best use has not been made of them. Thanks again for your long letter.

Francis Hicks, Watonga, Oklahoma:—Your questions are quite technical and most of them would take too much space to answer. I suggest that you get the *Aircraft Mechanic's Rigging Handbook* by R. S. Hartz. It's put out by the Ronald Press, 15 East 26th Street, New York City. It costs \$3.50 and is well worth it.

L. G. R. Toronto, Canada:—Many thanks for the snapshots you sent. I shall be pleased to add them to my personal collection after we use them. Thanks also for the details on the Sidstrand and the Superstrand. I will use them at the first opportunity. We might be able to use the D.H.90 plans if they were drawn well enough and offered full details. We would appreciate a better

picture of your workshop. It looks very interesting.

Richard Woda, Cleveland:—I know of very few cases where European air-screw rotation differs from the regular counter-clockwise system employed here. In some cases special engines are built to work in the opposite direction to provide opposite torque. We would like to get this Flea business straight. As far as we know, no firm in this country has decided to build Fleas outright, but many firms are building and selling parts and the kits.

Norris Gear, Philadelphia:—Sorry, but I never heard of the man you mention. There was no 77th. Pursuit Squadron, A.E.F. during the war and he is not listed in any history of the Lafayette Escadrille I have.

Maglin S. Baker, Jr., Aquirre, Porto Rico:—A few American planes and motors are licensed to be built abroad. The fastest American plane today, and the fastest landplane in the world is the new Hughes racer which has done 352 m.p.h.

Jerry Fried, Tucson, Arizona:—The Northrop Gamma has a top speed of 224. It cruises at 215 and is equipped with a 575 h.p. Cyclone. It has a payload of 1,173 lbs. and its weight fully loaded is 7,350 lbs.

LeRoy Falk, Chicago:—The ship picture you sent me is that of the 1933 Martin 123 bomber. The holes you mention are inspection panels and the rods are tubes through which certain controls run from the cockpit to the engines. Radials have an odd number of cylinders to give an even swing to the firing order. For instance in a nine-cylinder motor the firing order might be 1, 3, 5, 7, 9, 2, 4, 6, 8, and then start at 1 again, which allows every other cylinder to fire and still not miss any. Get it?

Carl Leed, Denver, Pa.:—Most of the war-time single-seaters, which includes the Spads, were either destroyed or parcelled out to the few remaining squadrons that stayed on Army of Occupation or home defense units. A few were sold to individuals—minus their military equipment. The Spad carried Vickers guns. Eddie Rickenbacker, with 26 official victories, is the leading American wartime ace.

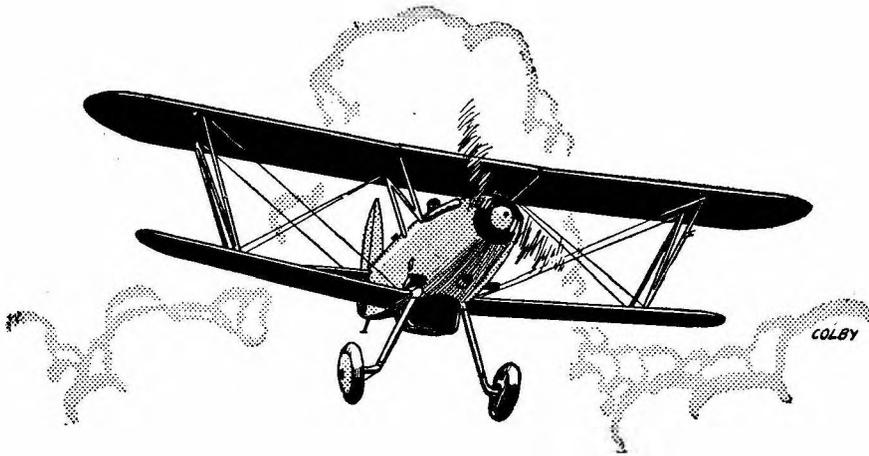
Ellsworth Clarke, Tulsa, Oklahoma:—I have never been able to get an answer to the question as to why the German wartime Mercedes engines had such a
(Continued on page 59)

And Now We'll Ask You a Few

- 1—What squadron was designated by the name, *La Desperados*?
- 2—Who was Jimmy Collins?
- 3—When did Eddie Rickenbacker bring down his first enemy plane?
- 4—In what capacity did Frank Baylies first go to France?
- 5—What does *Rittmeister* mean?
- 6—Who is the only known Roumanian ace?
- 7—What plane is the chief single-seater in the new German air force?
- 8—To what squadron did Captain McKeever, the two-seater ace, belong?
- 9—What are the prices of the following light planes: Taylor Cub, Porterfield, Taylorcraft, Ryan S-T?
- 10—How many victories did Lothar von Richthofen score?

Answers on page 96

Modern Planes Album



HAWKER FURY

HAWKER FURY FOR SPAIN

THE news that the British are building several up-to-date models for the Spanish Air Service, comes at a particularly interesting time. Since relations are somewhat strained between Italy and her old ally, Great Britain, the British have

suddenly realized that there are many geographical points of value in Sunny Spain. Whether the Castilian interest in British aircraft has anything to do with the political situation, can only be surmised.

This new model Fury, built especially for the Spanish Air Service, is powered with the Hispano-Suiza

12Xbrs engine, which is rated at 690 h.p. and which gives the machine a top speed of 236 m.p.h. at 13,000 feet. Three full squadrons of these Furies are being built, and Spain will soon have to be reckoned with as an air power if this sort of thing keeps up.

The first three machines of this type are to be built at the Hawker factory in England, but the rest will be made at the C. A. S. A. and Hispano Suiza plants in Madrid under license. The same firms will also make the Hawker Osprey navy two-seater in both a landplane and seaplane version.

The Spanish Fury, as will be noted in the picture, has the new Dowty internally-sprung wheel fitted on a cantilever undercarriage leg, which is an improvement over the former Hawker undercarriage. Reports of tests indicate that the plane handles equally as well as the standard R.A.F. type, but of course it is not as fast as the Kestrel-powered British model. It is interesting to note, however, that this Spanish machine climbs to 16,400 feet in six minutes.

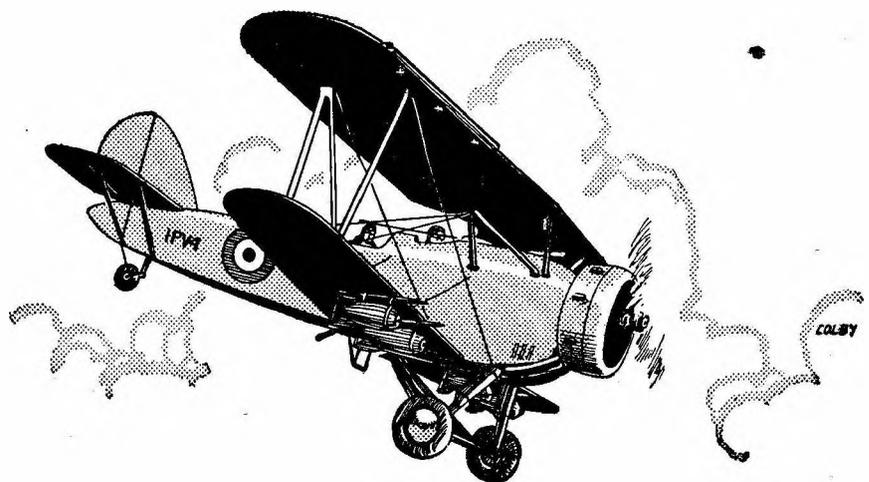
HAWKER PV-4 DIVE-BOMBER

HERE'S something entirely new in British aircraft—a dive bomber. And from what we can make of it, this new ship is a crackerjack.

For some reason, the British in the past have never really given dive-bombing a tumble; but with the general shake-up in the Fleet Air Arm and with every ship in the Grand Fleet getting a thorough going-over for further developments in Naval aviation, they have at last come to the conclusion that there must be something in this dive bombing after all.

As is generally known, the U.S. Navy first perfected dive-bombing as it is practiced today. Perhaps that's why the British questioned it. For the same reason, perhaps, you can't get an American Army man to admit there is such a thing as an interceptor, or even a use for one. The two great English-speaking powers are rather goofy that way.

But now the Hawker firm has been playing with the dive bomber idea for several years and this one comes in their P.V. (Private Venture) category—which means they went into the business on speculation and not on order by the Air Ministry.



HAWKER "P.V.4"

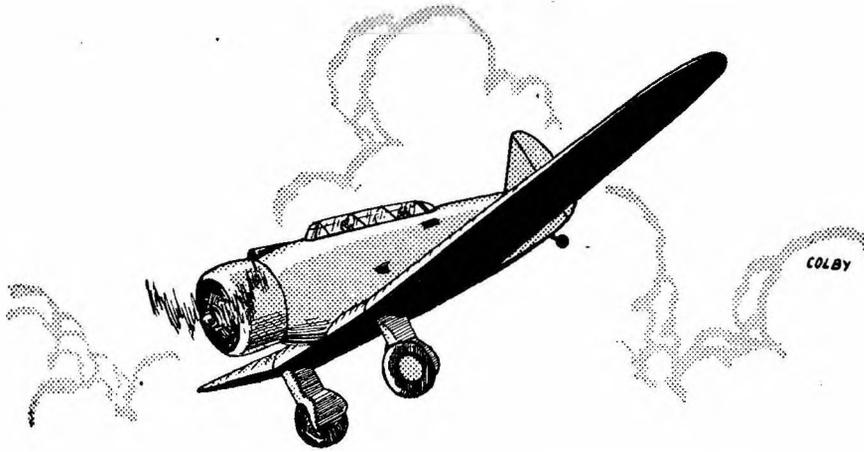
The P.V.4. is a two-seater with a particularly deep fuselage. The pilot and observer sit very close together. The ship is powered with a Bristol Pegasus engine, has two Vickers guns up front, and a high-speed mounting for a Lewis in the rear. As may be noticed, the craft is strengthened for dive-bombing. The fifty-pound bombs (four are carried) are

set in outboard wing-racks.

The Pegasus develops 920 h.p. for take-off and 870 h.p. at 5,750 feet. From careful checking, we presume this machine has a top speed of more than 200 m.p.h.; for being comparatively short and compact for a two-seater and considering her power plant and general lines, she should cruise at 190 with comparative ease.

ANOTHER BATCH OF SKY BATTLERS

In this month's tour of World Power tarmacs, we view four particularly striking military jobs. Our offering includes: The Hawker Fury for Spain; the Hawker PV-4 Dive-Bomber; the classy North American NA-16 basic trainer, designed for the U.S. Navy; and the amazing new Belgian Renard R-32 observation ship. Look 'em over, fans!



NORTH AMERICAN NA-16

NORTH AMERICAN NA-16

THIS is a new American military monoplane, and from what can be made of the information available, it is intended as a new basic trainer. We understand that 100 of these ships, or at least machines very much like the one shown here, have been ordered by the U.S. Navy for trainers (see the North American BT in our model section).

The ship is made by North American Aviation, Inc., at the Los Angeles Municipal Airport, Inglewood, Calif.

Personally, we believe this is one of the finest training machines in the world; for it appears to have all modern improvements and is suitable for carrying several types of motor, depending on the speed desired with reference to the progress of the student who is flying it.

The cantilever-type wing is of

aluminum-alloy stressed-skin construction. The center-section is of parallel chord and thickness, but the leading edges of the outer panels have a racy sweep-back which in all probability offers the maneuverability of the tapered wing. In addition, it appears that this sweep-back gives improved visibility from the cockpit. Split trailing flaps (Wright type) are built into the wing and operate mechanically by a toggle-link mechanism.

The fuselage is a welded chrome-molybdenum tubular structure and there is a special metal unit built between the pilot and the observer to protect them in case the ship accidentally noses over. The undercarriage on the standard job is a single cantilever type, but a retractable gear may be fitted. This would add eight miles an hour to the top speed.

The craft may be fitted as a two-seat fighter with three guns, or it may be equipped as a single-seater with the same engine (the Pratt and Whitney Wasp H-type) to develop a top speed of 222 m.p.h. As a fully equipped two-seat fighter it will do 212 top at 11,000 feet.

This is a splendid type and we are glad to hear that it is being adopted as standard equipment.

BELGIAN RENARD R-32

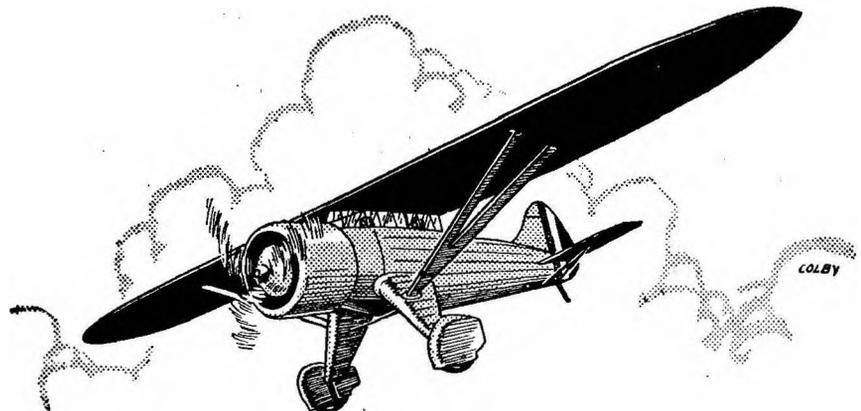
HERE'S an observation machine that does 230 top at 13,000 feet. It has a service ceiling of 37,000 feet and a range of 800 miles. It climbs to 16,400 feet in seven minutes and can be quickly converted from a two-seat fighter to a light bomber.

This is a development of the earlier R-31, of course, but instead of the 480 Rolls Royce Kestrel, they have taken over the Gnome-Rhone Mistral Major, a fourteen-cylinder radial which develops 870 h.p.

It is seen that the cockpit arrangements have been changed; for in this R-32 the pilot sits between the spars of the center-section and the observer is in line with the trailing edge of the wing. The cockpits are closed in by transparent slide panels (which fill in the gap between the wings and the fuselage) and by a transparent roof which begins at the front center-section spar and terminates over the observer's cockpit.

The wing is built in bi-convex sec-

tion with an elliptical plan form. It is made in two sections joined at the center-line. There is a Vee strut on each side of the fuselage. The general structure is a light metal with a fabric covering, but the leading edge is protected with a duralumin sheet. Long tapering-chord ailerons



RENARD R-32

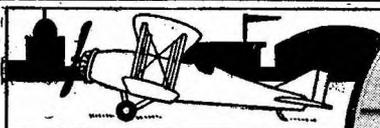
are inset from the wing-tips and they may also be used as trailing-edge flaps.

The fuselage is all-metal in structure with rounded corners, and the main transverse frame is built up of dural sheet to which are attached the

(Continued on page 91)

HAPPY LANDINGS

BY ARCH WHITEHOUSE



They Still Want Those Flyers . . . What Plane Is That? . . . News and Notes

A SHORT time ago, we published with rare enthusiasm the report that the Navy was asking for candidates for short-time service commissions. In other words, the Navy wanted some more pilots to fly their Grummans, Boeing F4B-4s, and Martin Dive bombers.

We presented this information in the belief that hundreds of our readers would leap at this swell opportunity to get into aviation and learn it properly. It was a chance to fly real ships, wear a grand uniform, and, what is more, be paid generously while learning.

The Navy asked for eighty candidates in the New York area.

Did they get them? *They did not!* Less than half of this quota reported!

I HAVE been trying to figure it all out. As a matter of fact, I have made a rather thorough study of the situation. And I've come to the conclusion, after careful consideration, that it's that education requirement—those two years of university training—that has the majority of the boys stumped. Most of 'em have got everything else.

I want to tell you that it's mighty pathetic to get so many letters asking if there isn't *some* way one can get around that line on the application blank which reads, "Two years of university training, or its equivalent." As things stand now, there isn't.

So, we can only go back to the advice we have given time and time again: You can't fly for Uncle Sam unless you stick to your books. While, it's true that with nothing more than a grammar school education you can learn to fly and may become a skilled pilot, you cannot become a fully trained military pilot without certain scholastic training, such as algebra, physics, chemistry, and kindred subjects. While such learning isn't absolutely necessary in the fine old art of dropping bombs or photographing enemy defenses, they *are* of considerable help in absorbing pertinent aero information and in keeping one toe-to-toe with the progress of the class or group.

For instance, you can work out compass courses and all sorts of map-reading problems with straight primary arithmetic, but by using algebra, or higher forms of mathematics, you can complete your work much faster and with more accuracy. The same goes for

many other important subjects. The few men who come up from the ranks as gunners, fitters, or the like, and reach the grade of commissioned pilots without going through the regular Cadet schools are usually men of high type and most of them have a splendid educational background into the bargain.

If you are still keen, then, for a service cockpit, forget all the so-called short-cuts, and *stay in school as long as you possibly can*. We realize that not all of you can go to college, but if you complete your high school courses and select your subjects carefully, you should have little trouble in completing your required college time at nights or on the part-time system available in so many big cities.

WHAT PLANE IS THAT?

A NEW book has just reached our desk. *What Plane is That?* is its title. And we'd like to see it in the hands of all boys and girls in this country. It was written and compiled by C. A. Weymouth, Jr., and it is published by the Frederick A. Stokes Company of New York City. Mr. Weymouth, we understand, is a graduate aviation engineer and has had vast experience in many branches of aviation. The book also has an interesting foreword by Captain Eddie Rickenbacker.

The idea of *What Plane is That?* is to present the modern airplane in such a manner that one can immediately recognize it. The title of the book is a question that is heard everywhere, not just at airports. Mr. Weymouth presents about fifty modern American planes in detailed drawings, stressing certain points so that when a plane is seen in the sky or on the ground, one can immediately tell whether it is a Cessna, a Fairchild, or what not.

The drawings, in general, are good as to outline, and the only improvement we could suggest would have been to include a silhouette of each machine as it is seen from below when one is looking up at it from the ground. For instance few people can tell the difference between the Boeing and the Douglas transport. But a silhouette would disclose that the leading edge of the Douglas is swept back, whereas that of the Boeing is straight and the wing is differently tapered.

Each page of this fine book is devoted to one plane, and in addi-

STICK TO YOUR BOOKS, BOYS!

That's the advice Arch Whitehouse offers to all you fellows who hanker to join the air service. And he emphasizes that advice this month because the Navy is failing to get enough pilot applicants who can pass their tests—and the biggest stumbling-block is that education requirement.

tion to the drawings Mr. Weymouth has added details of the capacity, weight, length, wing-span, power-plant, speed, climb, range, and service ceiling.

We handed *What Plane is That?* to a 10 year old boy the other day without making any reference to its contents. He was missing for several hours and eventually came back with all the details of the plane he would like us to purchase. He knows its speed, its motor, and its seating capacity.

It was interesting to note that he had selected a three-passenger Fairchild 24, which he figured would be "family-size." Prior to this, he had only been interested in colors, the number of engines, and whether the plane in question was diving on a German triplane or not!

We believe that's the finest thing we can say about *What Plane is That?* For this boy now knows there is such a thing as landing speed and cruising range, and for the first time he is able to make a comparison between the relative merits of an automobile and an airplane.

Needless to say, his family "bus" has lost considerable cast since *What Plane is That?* arrived.

NEWS AND NOTES

WE learn new things about the Great War every day. For instance, I have often been asked what an S.E.4 looked like. Frankly, I had never heard of one. Now, twenty-two years later, I've found a photograph of an S.E.4 which was built and flown at the the Royal Air-

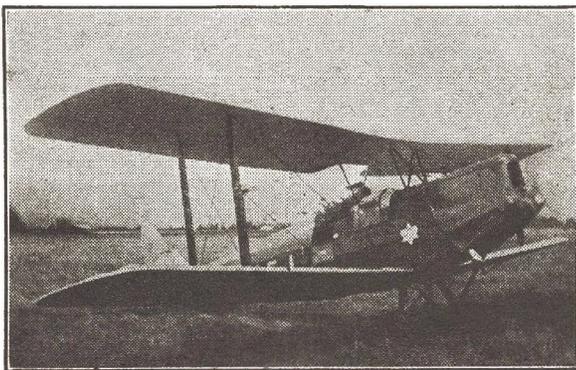
craft Factory as early as June 14, 1914. The amazing thing about it is that it had a four bladed prop with a spinner, a streamlined engine cowling, single interplane struts with the bases streamlined, a tapering high-speed fuselage, a faired axle, and a pilot's cockpit that was glassed in!

And that was twenty-two years ago!

We now learn that they have just put a red triplane in Germany's new War Museum and underneath it has been placed a card and a wreath commemorating the eighteenth anniversary of the death of the great Baron von Richthofen. But in small type—very small type—they add that this was just one of the triplanes the great Baron

(Continued on page 92)

Herbert R. Pickering, an F.A.C. in far-off Levin, New Zealand, sent us this "shot" of the Levin Flying Club's Gipsy Moth Coupe. A fine job for light plane work, the Coupe has a transparent cockpit cowl which can be completely closed for instrument-flying instruction.



What's Wrong With the Pou?

Canadian Clubs Get Fleets

Show and Race Dates

Taylor and His Taylorcraft

On the Light Plane Tarmac

WHAT'S WRONG WITH THE POU?

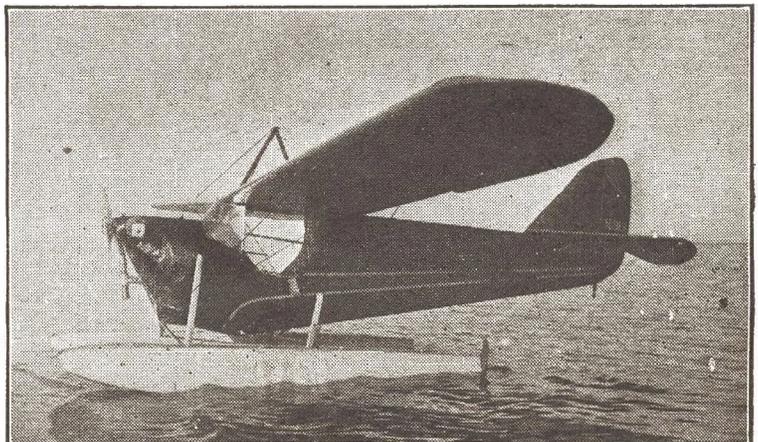
LIGHT plane enthusiasts are in a quandary about the *Pou*. When it first streaked across the sport flying horizon at seventy miles per hour, there were many who saw Utopia in the offing—the Utopia of all flying men. This *Pou du Ciel*—or "Flying Flea," as we call it—promised cheap and safe flight. It could be built by the flyer himself and flown from almost anywhere. Henri Mignet, the charming Frenchman who designed the *Pous*, has flown them for years; and many other well-known airmen have done amazing things with them. But nevertheless the *Pou* has had its troubles.

For months, it was applauded as a foolproof plane, and as many as fifty were being flown regularly in Europe with little or no damage to anyone. During the last few months, however, seven fatalities have been recorded—five in France and two in Great Britain. It was inevitable that with more *Pou* enthusiasts flying and building these little ships, there would be mistakes either in pilotage or workmanship, but few expected that there would be so many accidents, some offering no clue as to the actual cause. The mystery lay in the fact that the accidents that befell these unfortunate Flea owners didn't seem to be caused either by human error or faulty workmanship. There was no apparent structural failure.

But now, they've apparently got a clue to the trouble. We of FLYING ACES learned this after

a search of the foreign air journals which carried news of these accidents and which attempted to sift out the actual cause of these fatalities. You see, several noted European designers have pooled their findings and their theories—and it all seems to go back to the fact that the *Pou du Ciel* is too sensitive due to its center-of-gravity position. In short, a shift of an inch or two in the C.G. may affect the flying qualities not a little. In a few machines a set location has been happily discovered; and we feel now that unless the center of gravity is

(Continued on next page)



We're envious! We'd certainly like to have this little Aeronca to play around with on our vacation. Those Edo floats make the popular little light plane ideal for fun around a lake, fishing trips, or just an all-around good time. Ho, for the open country, my mates!

very far removed from the recommended position, it is not likely to cause serious trouble.

Then again, further investigation discloses that the relative wing positions are much more important than the C.G.—and the position of that front wing hinge is very important since in a wing where the center of pressure is not quite stationary, it may become unstable by certain center-of-pressure changes. Some have even gone so far as to state that in unusual cases such movements might cause a stalling of the front wing, leaving the way open for an involuntary dive. Of course, if your ship has sufficient height when this occurs it is not necessarily dangerous.

For those who are considering the building of a *Pou* or are actually building one now, it will be well to be sure that the pylon carrying the front wing is no shorter than that recommended by M. Mignet. If this pylon is shorter, and there is no limit on the angle of incidence the front wing may reach, it is quite possible that a slot effect may occur which will prevent recovery from a flying maneuver. Then again, further changes in the original design, incorporating too much overlap of the two wings, may have a similar effect.

These are mostly theories, of course, but it boils down to the fact that amateur builders should proceed with caution when constructing these tiny

machines. It is very easy to "improve" on someone else's design to get a little racier line, a little more dash, or a streamline effect—but it should be remembered that in a machine with such a short overall length, any change made in its original aerodynamic features is likely to have far greater effects than those attempted on a machine with a longer fuselage. Do not attempt to give your Flea racing lines by lowering the front wing. Too much wing overlap is likely to cause trouble. And above all, you ex-motorcycle hounds are warned against "jazzing" the *Pou* throttle, particularly if you are using excessive motive power.

(Continued on page 92)

The New Airmail Pals

* * *

FOR several months, your friend, the Right Honorable Pal Distributor, has felt a bit blue because you scribblers were so busy writing to each other that you were forgetting all about him. That's why the R.H.P.D. has been hinting for some of you to take time off once in a while and write *him*.

Well, fans, you certainly came across this month! I'll say you did—and how! And as Bgn Bernie would say—thanks, all youse guys and gals!

One fellow—Bill McBrown, of Detroit, Mich.—tosses a good one our way. You know that ad crack that reads, "I'd walk a mile for a Camel?" Well, Billy says—

. . . I enjoy reading FLYING ACES very much; in fact, I walked two miles to the City Airport to get the July issue!

All of which gives the R.H.P.D. an idea. If any of you have walked *over* two miles for a copy of F.A., let's hear about it. We want to find out who holds the home-to-newsstand closed distance record. So far, Billy's the champ—and he's beaten Camels a mile!

But let's get to other swell letters you Pen Pushers wrote us. There's Russell Gunsaulis, of Sedalia, Mo., who says in part:

. . . I have been reading FLYING ACES for a long time. If there is a better mag on the market I have yet to see it, and I think I've looked at about all of them. Boy, F.A. is swell—it's got everything! . . . I wrote two letters for Pals and I got 'em—swell Pals each time.

Thanks for the orchids, Russ. And here's an interesting letter from Lester Shultz, of Ashland, Ohio. Says Les:

. . . Not long ago I wrote for a girl Pal. You hooked me up with a girl in Kansas who surely can write letters with snap and personality!

Look out, Les, you're weakening! But to go on with his letter—. . . *To date my correspondents have fallen off to eleven. As I have plenty of time on my hands, I'd like to have a lot more."*

There's your chance, Pen Pushers! If you want an additional Pal, just send us a letter and we'll forward it to Les.

In going over several hundred Pal letters this morning, your friend, the R.H.P.D., was impressed with the great interest in stamp collecting. We're going to do our best to hook up stamp collectors with Pals of their "kind." Now we're going to mention several outstanding collectors, and if you fellows and gals who go nuts over stamps would like to write these birds, go ahead—the more the merrier. But don't forget the stamped envelopes!

Robert Cowlshaw, of Palmerston North, New Zealand, says his stamp collection has about 21,000 stamps—mostly American. Another "Aussie"—Ray Russell, of Brisbane, Queensland—says that he has an album owned by his dad as a boy. He says he has some fine stamps in it, including some old American ones, and offers to trade with stamp fiends. We'll bet both of these collections are beauties and we expect Bob and Ray to become popular young men here at GHQ. All mail should be addressed to them in care of this office.

Some of our readers are of a serious mind while others like to write and receive letters with fun spotted here and there. We have a letter from a bird who likes to write in the lighter vein—one Robert "Sparkey" Ferris, of Van Wert, Ohio. "Sparkey" says he and his gang have an old model "T" Ford, called "Betsey," in which they ramble around. Here's your chance to find out how these things, so often featured in comic strips, behave in real life.

Now we've done it—gone and used up all our space when we could go on and on and on. But the rest will have to wait until the next time. Cheerio until this time next month.

—THE RIGHT HONORABLE PAL DISTRIBUTOR.

HOW TO GET AN AIRMAIL PAL

FIRST, write a letter just as if you were writing to your new pal—the kind of letter which tells your age, particular interests in aviation, your hobbies, et cetera. (If you wish, you may include a separate sheet of paper telling us, in a general way, what kind of a pal you seek). Next, send this letter to Airmail Pals, care FLYING ACES, 67 West 44th St., New York City. And be sure to enclose a stamped, self-addressed envelope.

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 telling your age and 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.

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

JOIN THE FLYING ACES CLUB

Honorary Members

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

Casey Jones	Rear-Admiral Byrd
Wallace Beery	Capt. Edward Rickenbacker
Al Williams	Colonel W. A. Bishop
Col. Searoni	Major G. A. Vaughn, Jr.
Major von Schleich	Willy Coppens
Lieut.-Col. Pinsard	General Balbo
G. M. Bellanca	Amelia Earhart Putnam
Capt. Boris Sergievsky	Frankie Thomas
Colonel Roscoe Turner	Josef Veltjens
Charles W. A. Scott	Tom Campbell Black
Richard C. DuPont	Eric Kingsford-Smith
Capt. A. W. Stevens	Capt. Edwin C. Musick
Capt. O. A. Anderson	Clarence D. Chamberlin

Mrs. Charles S. Baylies
 Lieut.-Col. Theodore Roosevelt

Official Charters

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

Volunteers for G-2

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

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



COUPON
 No. 46

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.

Do Your Full Share to Advance Aviation

No Dues—No Red Tape

How to Join and Form a Flight or a Squadron

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

It's the easiest thing in the world to join. Just clip out the application blank at the right, fill in, and mail, along with a stamped, self-addressed envelope, and you will receive your official membership card by return mail. After that you can quickly advance to earn CADET WINGS, PILOT'S WINGS, and other honors.

To organize a squadron, you must have 18 members, including yourself, holding cards. To organize a flight, you must have six members, including yourself. Send names and addresses to headquarters. To cover costs of the official squadron charter a charge of 50 cents is made, and 25 cents for the flight charter.

Meetings and activities are conducted among the squadrons and flights according to the wishes of the members. GHQ has established no rulings in this respect, nor are there any dues or red tape whatsoever. The entire idea of the Club is a common meeting ground in an international organization for the lovers of aviation in its various phases.

Many fine friendships have been formed through the Club. Many youths have found an incentive to fly, and aviation's makers of history have lent their names and given their advice and best wishes to the F.A.C.—the ever-growing legion of eager, actively air-minded men and women, boys and girls.

The simple rules of the F.A.C. are clearly put on this page. Learn them and read the F.A.C. news in the magazine. And remember—when you write, always send a self-addressed stamped envelope, for the Club receives thousands of letters each week.

THE HIGHEST AWARDS

After the membership card and Cadet and Pilot's Wings, comes the Ace's Star, awarded for obtaining five new F.A.C. members, using the application to the right. The FLYING ACES CLUB DISTINGUISHED SERVICE MEDAL is awarded to members whose work on behalf of the club is "beyond and above the call of duty." The best way of putting yourself in line for this coveted medal is through the medium of efficient G-2 work, and of course honorary memberships of prominent flyers, or persons otherwise engaged in the various phases of aviation, will bear weight when members are being considered for the D.S.M.

Attention, F. A. C's!

This Beautiful Aviator's Identification Bracelet



Now 25c!

Because we wish to place the beautifully designed F.A.C. AVIATOR'S IDENTIFICATION BRACELET within the reach of all members of the club, decision has been reached to cut, temporarily, the price in half. Remember—this offer will be in effect for a short while only, and we suggest that you send your quarter immediately, since this is a real bargain. In sending coins be sure to wrap them securely.



The
 Beautiful
 F. A. C.
 Ring

The official F.A.C. club ring is a beauty and should be worn by all members. It is self-adjustable, to insure a perfect fit. It is finished in antique silver. Sent post-paid anywhere in the U. S. and possessions for only 50c. (A STERLING SILVER ring, of similar design, may be had for \$1.00)

September 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

Citations and awards, heretofore published on this page, will henceforth be found at the close of the Club News. Be sure to refer to those columns—YOUR name may be among the names to be found there.

F. A. C. Stationery and Official F. A. C. Pennants

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

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

COUPON
 No. 43



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.

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

Flying Aces Club News

Fans, there's BIG NEWS here for you this month! We've let loose with a new and striking F.A.C. award—the MEDAL OF HONOR! And not only do we picture it here in full size, but also, in answer to many requests, we offer you a photo of our great Distinguished Service Medal. Read all about it, F.A.C.'s—and don't miss all the latest Club news that's likewise on tap here.

✱ ✱ ✱



Our smart new award—the Medal of Honor.

EXTRA! EXTRA! The FLYING ACES Club has a splendid new medal for you Clubsters to try your hand at winning—the magnificent MEDAL OF HONOR! It's the highest award in the Club—and now, who'll be the first to achieve it?

We've often heard it said that a picture can tell a story to better advantage than several hundred words. That's why we offer you a full-size photo of the new medal here at the top of our page. Certainly, the MEDAL OF HONOR is a worthy companion to our DISTINGUISHED SERVICE MEDAL, which we also depict, by popular request, at the bottom of the page. You see, not a day passes without our receiving numerous letters asking for a picture of the D.S.M. So—we're killing two birds with one stone by giving you Buzzards pictures of both medals.

But since words do tend to complete pictures, we take pride in telling you something about the new MEDAL OF HONOR. First off, neither time, effort, nor expense was considered in creating this new award. The medal itself, together with the bars you see pinned on its colorful blue and gold ribbon, are of bronze with raised lettering. Yes, it presents an extremely rich effect.

"How are these medals won?" we hear you ask. If we were to say 'easily' we'd not be telling the truth—for anything really worth while is not easy to get. Well, the new MEDAL OF HONOR,

as well as the D.S.M., are available to F.A.C. members rendering efficient G-2 work. This G-2 work is highly interesting, and instructive, too. And we hasten to say that these medals cannot be bought at any price—they've got to be won! If you're an F.A.C. not already in G-2, a note to your old friend, Doug Allen, will bring a letter and application blank by return mail.

"And what of those bronze bars that read, 'Loyalty,' 'Service,' 'Merit,' and 'Valor,'" you ask. Well, F.A.C.'s, those bars can be won by additional work—just as additional outstanding work is required to win the bronze propellers to put on your D.S.M. These bars—that is, the first three of them—may be won in sequence after you've achieved the new MEDAL OF HONOR itself.

But that last bar—the one which reads, "Valor"—is the absolute ultimate in FLYING ACES Club achievement. Just like the Victoria Cross was the highest triumph to be gained in the British Service and the *Pour le Merite* was the greatest honor to be won in the German service during the World War—so the Valor Bar has been designed to be awarded for the most striking accomplishment over and above the line of duty by an F.A.C. member. In accordance with its value, award of the Valor Bar will, we predict, be extremely rare. We can't say how you can win it. That's up to you. But a decidedly noteworthy, unselfish deed would do it.

NOW that we've told you the big news about the new medal, let's see what our fellow members have been doing since our meeting last month. As a general rule, the summer season is marked by a let-down in club activities. But not so this year! Correspondence continues to pile into GHQ at the same rate that it did all winter, and we're mighty glad indeed to realize that you fans find the good old mag and the F.A.C. so interesting that it overcomes "Summeritis." ("Summeritis," you know, follows spring fever.)

The first letter that comes to our attention is from Bill Anderson, Jr., of Edinburgh, Scotland, and say—Bill has secured a couple of fine honorary members for the Club! They are none other than Amy and Jim Mollison, better known as the "Flying Mollisons." Fine work, Bill. We're more than pleased to welcome both Mr. and Mrs. Mollison to the F.A.C. tarmac.

We were also happy to receive a letter the other day from "Reg" Burke, the new Commander of New Zealand Squadron No. 1, at Wellington. It has been some time since we heard from Reg's outfit, but he promises real ac-

tivity from now on, advising that while they have as yet been unable to have their own plane, the unit is now considering building one of the famous *Pou de Ciel*s—or Flying Fleas. Reg tells us that the recent opening of the main trunk air service of Union Airways at Palmerston was responsible for the renewed interest which set them on the road to getting a plane. As Winchell would say—orchids to Union Airways!

Lord Baltimore Squadron No. 2 and Martin Clipper Flight "A," both of Baltimore, Md., recently held a dinner party and dance which brought their meetings to a close for the summer. Commander Howard R. Lilly also advises that Flight "A" was recently treated to a talk by a mechanic from their local Curtiss-Wright Airport. There are no two ways about it—Howard and his bunch down there in Baltimore certainly know how to run things in fine shape. Moreover, they always send exact "minutes" of all their meetings. (Other units please take note!)

Last month we told you how our old friend, George Cull, of San Francisco, stepped out of his favorite role of "landing" honorary members by up and copping a prize for model building offered by the *San Francisco Examiner* (see photo on this month's model builder's page). This trip, true to form, George has signed up Captain Ralph A. Dahlstrom of the *Hawaiian Clipper*. Captain Dahlstrom not only accepted honorary membership in the F.A.C., but



The Distinguished Service Medal.

promised to write George a letter upon his return from Manila. George, what is this power you have over prospects for the honorary membership roster? We think you could "land" Charlie Lindbergh, himself. How about trying it?

AND still honorary members pour in! Travis Smith, Jr., of Wharton, Tex., has signed up Carl Reynolds, of the Boston Red Sox; Allen Reasoner, of Woodstock, N. Y., has come across with another honorary member—this time "Jimmie" Mattern, famed flyer and Technical Aeronautical Adviser of The Pure Oil Company; and from across the seas comes a letter from our friend, A. G. Smith, of Cranebrook, Australia, enclosing a letter from Mrs. M. J. Ulm, accepting honorary membership in the Club.

Col. Paul R. Guerrero, of Tacoma, Washington, obviously feeling that he didn't have sufficient duties as Commander of the Philippine Squadrons, recently asked permission to form Squadrons in the Hawaiian Islands. No sooner did GHQ grant this permission than along came a report to the effect that things look extremely promising—the first report from Captain Neikanoa Corpuz, Paauhau, Hawaii, advises that they already have ten members. No doubt by this time they've increased that number many times over.

Activities in the Philippines are also



This F.A.C.—Ruben Hart, of Spokane, Washington—has the right idea! That Douglas O-38E beside which he's pictured is one of the planes which he helps keep fit. You see, Ruben figured that the best way of learning any business is from the ground up, so he enlisted with the 41st Division, 116th Observation Squadron of the Army Air Corps. He's getting a thorough knowledge of military aircraft.

going full steam!—Squadron Adjutant Armando de la Cruz, of Laguna High School, reports that at the last meeting all F.A.C. members agreed to organize complete Squadrons in every class of that institution, from the Freshman to the Senior classes, in order that they might have better model contests, parades, and together with further activities in civic affairs. Adjutant de la Cruz is at present a Major of Laguna High Military Cadets and all members of his outfit know their military tactics.

Speaking further of activities in the Philippines—Cadetess Carlina "Carlie" Ordonia, of St. Mary's College, Bayombong, Nueva Vizcaya, along with the members of her group, are expecting to

wear their F.A.C. uniforms by this coming school year. In so doing they wish to promote the F.A.C. among other students from various provinces now residing in the city. "Carlie" was appointed Squadron Commander of the F.A.C. Nursing Corps. F.A.C.'s, if we could only get half that enthusiasm in our various schools here in the States, as depicted by the various units in the schools and colleges of the Philippines, it would not be long before we'd boast a membership of 100,000 instead of 50,000!

Activities of F.A.C. units rarely die out! We're just in receipt of a letter from Major Arthur Wilks, C.O. of the 1st Bristol (English) Squadron. Art starts his letter—"This is

a voice from the dead . . ." and tells us that after reading the Club News of a recent issue and noting all the real life displayed by other Flights and Squadrons throughout the world, he and his fellow members became bucked up plenty and now plan to go ahead in real fashion. They even intend to put in a short wave receiver a little later on and will listen in for stations of the F.A.C. net. (DPIHQ please take note!)

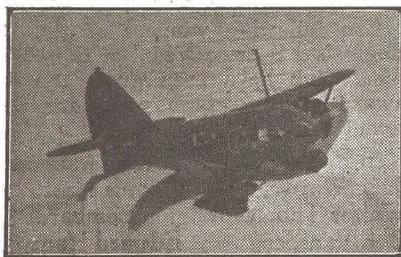
EACH year the FLYING ACES unit at Montreal, Que.—stationed at the St. James United Church and under command of W. S. Caie, Jr., and Ralph
(Continued on next page)

Latest Reports on the F. A. C. Transport Contest

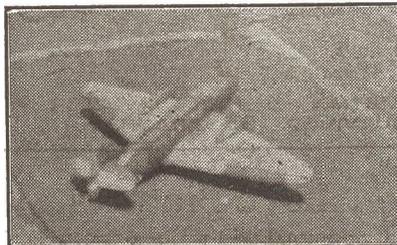
WELL, model designers, here's some more "shots" of ships entered in our great FLYING ACES Club Transport Plane Contest. And before we say anything further, we wish to remind you that since the Contest officially closed on July 20th, we'll have full announcements of the winners in our next issue. Don't miss it!

Maybe the judges—they're Doug Allen, National Adjutant; Herb Powell, Managing Editor of F.A.; Arch Whitehouse, author of those striking Kerry Keen and Buzz Benson stories; and Joe Archibald, who gives you those knock-out Phineas Pinkham laugh yarns—will decide that *your* ship has won the Contest. If so, your plane will be officially designated as the new FLYING ACES Transport and you'll get a year's subscription to good old F.A. into the bargain!

If you "rang" the second prize "bell"



Harold J. Dunham's neat transport.



Anthony Czelusniak's Yankee Sleeper.

with your entry, you'll get a half-year's subscription to FLYING ACES. And all others who sent in good snapshots of their F.A. Transports will get a special award. Yep, fans, don't miss this corner next month.

AND now let us tell you about the crop of Transport "shots" we give you on this page (see pictures). You'll note, first off, that the one in the lower right was sent in by a girl! That proves that you boys haven't got a monopoly on this aircraft designing game by any means.

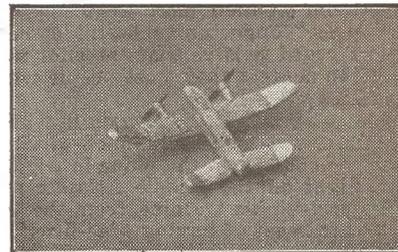
Miss Jane Paterson Campbell, of Marion, Illinois, is the feminine model builder who came through. Congratulations, Jane! We might mention that you're the *only* girl who entered the contest. Maybe the other girls were afraid to compete with the boys. But, by gosh, you weren't—and so you de-

serve some extra-special credit.

Jane calls her ship the FLYING ACES Comet. Its wing-span is only 4 inches, which shows that she's able to work "way down small." (Joe Archibald is happy because he figures there wouldn't be room for "Robby," the robot pilot, in Jane's Comet.)

Now then, cast your eyes on the center ship here. It was turned out by Anthony Czelusniak, of Brooklyn, N. Y. This job is "the Yankee Sleeper, designed, built, owned, and operated by me," writes Tony.

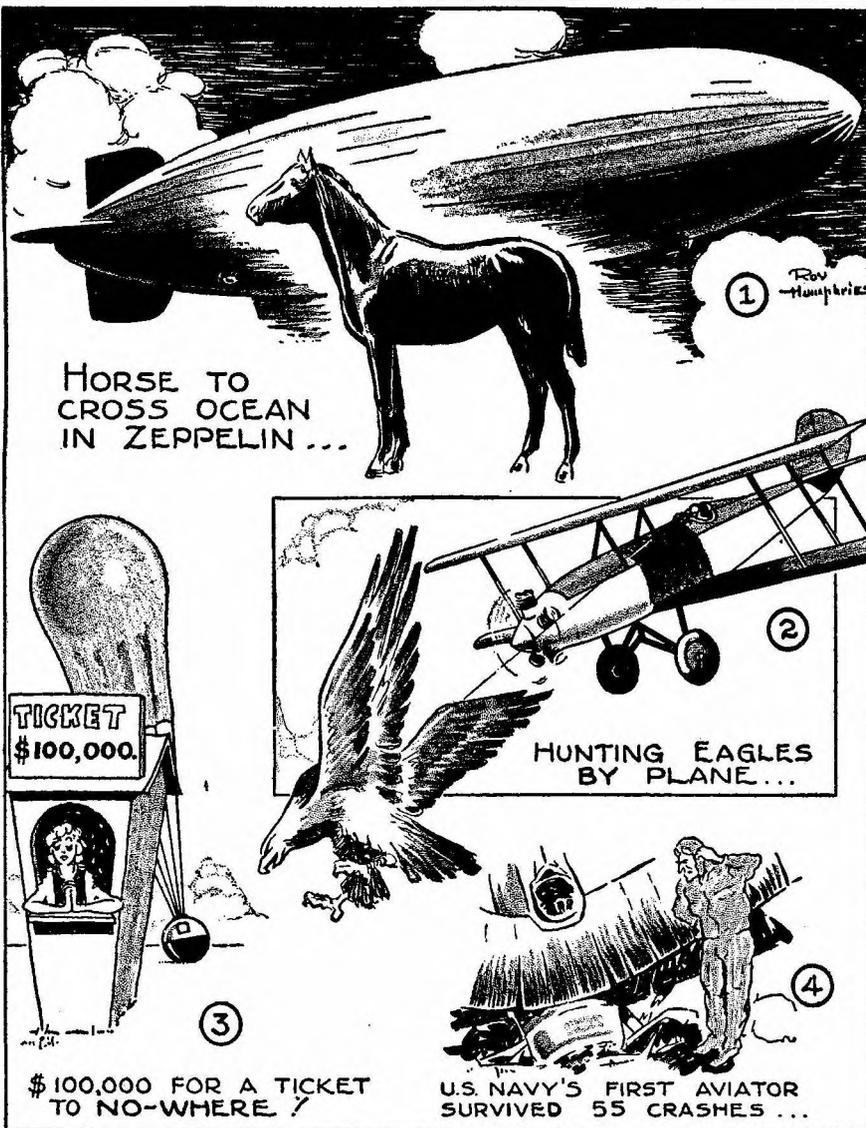
Apparently, he thinks Joe, Arch, Herb, and Doug are planning some over-night flights. Well, why not! The Yankee Sleeper, he reports, is 12½ inches in wing-span and 8¾ inches in length—and say, according to that, we'd almost be able to put Jane Campbell's tiny 4-inch Comet aboard and
(Continued on page 92)



Jane Campbell's Comet.

PILOTOPICS

By ROY HUMPHRIES



HORSE TO CROSS OCEAN IN ZEPPELIN ...

HUNTING EAGLES BY PLANE ...

TICKET \$100,000.

\$100,000 FOR A TICKET TO NO-WHERE!

U.S. NAVY'S FIRST AVIATOR SURVIVED 55 CRASHES ...

Stories Back of the Above Pictures

1—FOR the first time in history, a large animal will make a transoceanic flight when, as planned in the near future, the new Zeppelin *Hindenburg* will carry a valuable race horse from Germany to South America. To accommodate this pioneer sea-hopping horse, a special stable will be built aboard the giant airship. (Times have changed! The horse used to carry man; now man arranges to carry the horse.)

2—HUNTING eagles in their native habitat—the clouds—is the unusual sport of Ray Baumgardner, a Fort Stockton, Texas, flyer. Ray tells us he's been particularly fortunate in bagging the birds by pairs, "because," he says, "when you kill an eagle on the wing, its mate comes along to see what has happened—and is then easily slain." (All of which is great fun—for everybody but the eagles.)

3—IF you had \$100,000 to spend for a top-notch flying thrill, would you lay it on the line for a trip to *nowhere*? That, in effect was the proposition recently offered by Dr. and Mrs. Piccard, premier stratosphere explorers, when they announced that for that amount they'd take a passenger with them on their next stratosphere hop. Thus far, this "high trip for a high price" opportunity hasn't attracted any takers; and now Mrs. Jeannette Piccard tells us that the offer was made in jest, anyhow. (But it's probably the nearest that most people who "pack" a loose \$100,000 would ever get to Heaven.)

4—THE U. S. Navy's first aircraft pilot, Commander Theodore Ellyson, survived no less than 55 airplane crashes! Unfortunately, he was lost in the 56th when the plane in which he was flying went out of control during a flight off the Middle Atlantic seacoast. This pioneer American naval flyer received his training from the Wright Brothers. (Fifty-five crack-ups! And cats boast of having *nine* lives!)

S. Woods—conduct a concert and banquet. The one recently held was notable. More than one hundred persons attended the concert, while fifty-five members attended the banquet.

At the banquet, thirty new members received their membership cards, a large number of Cadet and Pilot's Wings were given out, and five Flight Charters were awarded! That makes a total of eight Flights now officially recorded here at GHQ in connection with the Montreal unit—the Flights running from "A" to "H" inclusive and thus representing as large a "range" as in any one F.A.C. outfit we've got.

Messrs. Caie and Woods are carrying on a great work in Montreal, and GHQ highly recommends the organization to those members living nearby who may be desirous of joining an established outfit that's got what it takes.

By the way, as I look over this "copy" I note that news and activities of foreign F.A.C. units once more stands out prominently. We of GHQ do not wish our American units to feel that we are showing preference to British, Australian, or Philippine outfits—but it so happens that your old pal, Doug, can only write up the news as it comes in. We know that our country's full of active F.A.C. units, but the difference lies in the fact that units across the seas let us know what they are doing while a majority of our good friends right around here keep us in the dark. Won't you remedy the situation, American C.O.'s?

JUST as I am concluding this write-up an old friend of yours has strolled into the office. He's none other than Joe Archibald, the fellow who put the axe into the head of "Robby" in that transport crack-up! Remember?

Joe says he stopped in to see how the F.A.C. Transport Contest was going—but if you ask us, he stopped in to see if anyone had sent in plans for a new Robot Pilot! Joe, you know, has as much love for a Robot Pilot as a Boston Bulldog has for a nice fluffy kitty!

Happy Landings and cheerio until next month—and don't forget that additional news, American C.O.'s!

—DOUG ALLEN

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:

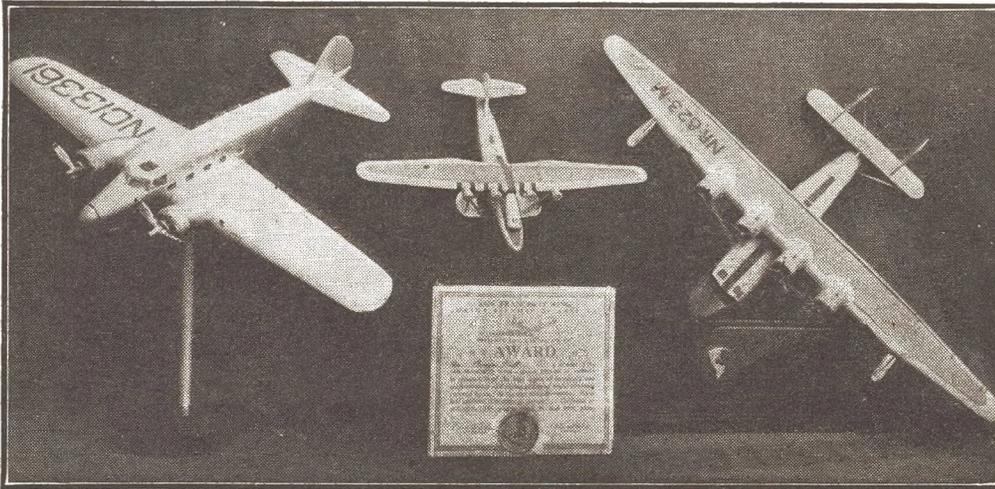
Albert Caltune	Edward Nolan
Chester Mroz	Willetta Crawford

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:

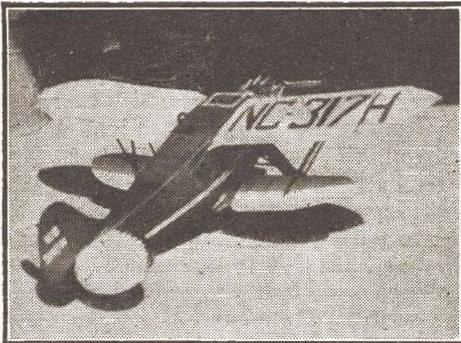
Ken Priest	Arthur Magson
Jack Ward	Dennis Nastu
Walter Thomas	Joe Lombardi
Bob Van Scog	Edward Hansi

(Continued on page 93)

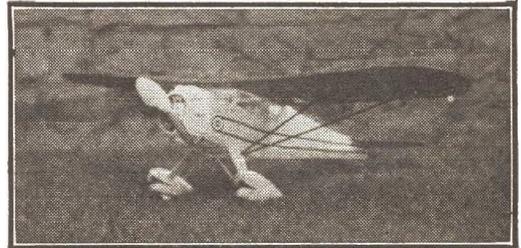
With the Model Builders



Left: Here's a prize-winning display of transport ships built by George Cull, of San Francisco. Left to right: Boeing transport, Martin China Clipper, and four-engined Sikorsky flying boat. We especially like the stand he constructed for his Sikorsky. Note that its supporting piece is a wooden replica of the Pan American Airways insignia. That was a novel idea, George, and we think your work is great!



Left: Remember those plans we gave you for the Waco Custom Cabin job in our May issue of FLYING ACES? Well, they certainly clicked with Bill Constantine, of Floral Park, Long Island—as you can see by this picture. Bill went right to work on his Waco the minute he got his May issue, and this is the ship he turned out. Mighty smart! And it's got all the trimmings!



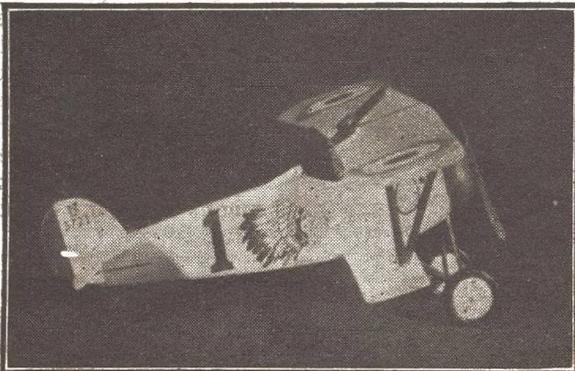
Below: And now we jump from California to Massachusetts—to Fitchburg, to be exact. Walter B. Pierce, of that city, turned out this swell 50-inch Monocoupe. It looks like the real thing to us. We'll bet it's a top-notch flyer.



Clayton F. Sherry, a student at Pratt Institute, Brooklyn, sends us this unusual view of his Gee-Bee R-7 model. His workmanship shows he's got a real knack for model building. And his paint job proves he's capable of tough assignments—for that scalloped effect on the wings isn't easy to get by any means.



You Heath monoplane fans had better take a good look at this neat job built by Joe W. Jackson, of Neosha, Missouri. You can see that his splendid paint and lacquer work rates with the best. There's nothing like a good finish when it comes to topping off a blue-ribbon model.



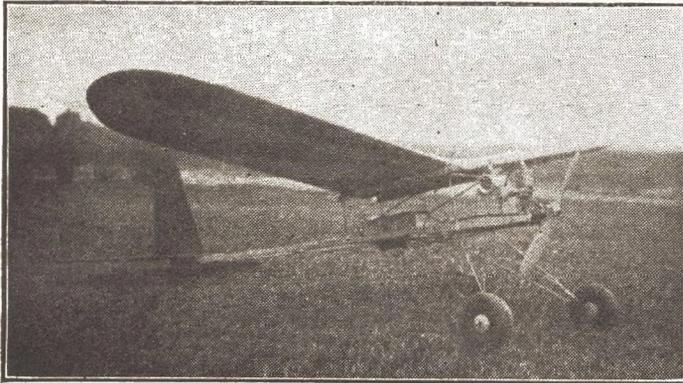
Bill Thaw, famed flyer of the Lafayette Escadrille, has gone down in history—and so has his striking Newport 27 bearing the Indian Head insignia. This neat miniature of Thaw's ship recently came off Norman L. Avery's model production line out in Primghar, Iowa. It has a span of 11 7/8 inches. We particularly like your paint-job on the insignia, Norm!



Meet Junior Frasher, of Elkview, West Virginia—and give his excellent 5-foot Stinson model the double-O. You can't blame a fellow for being proud of such a fine ship! We'll wager it makes a beautiful sight, flying down over that road and river, back there. That's real model flying country!

How to Construct

The Flying Aces Stick



Here 'tis, fans—the snappy, 5-ft. span Flying Aces Stick Gas Job. And as you can see, she's every inch a flyer! That's a Baby Cyclone engine in her nose.

By Bill Effinger & Thracey Petrides

DOESN'T a fellow have to have something extra on the ball to become a gas jobber?" Not a bit of it, brother! If you're an average rubber-model builder with a little spare common sense, you're all set to "get in."

"But," you say, "a gas model is a darn complicated thing to build, and—"

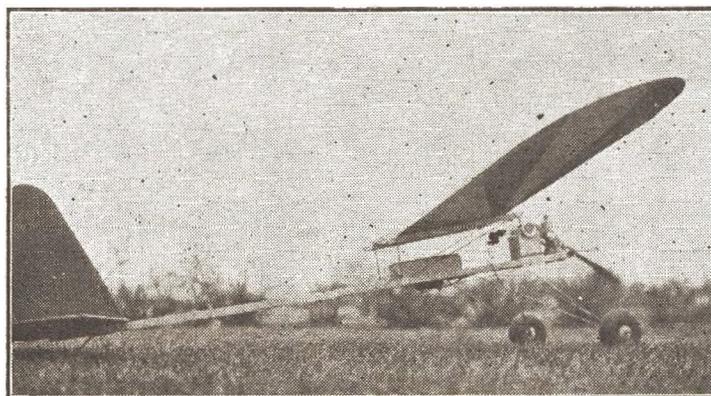
Pardon us for interrupting, but you're wrong again! Maybe you never realized it before, but there are stick-type gas jobs just as there are stick-type rubber powered models. And that's what we've got for here. Of course, we don't have to tell you that in this model game you can't beat a stick job when it comes to learning the ropes.

There are really only two reasons why the average model airplane builder who wants to make a gas model hesitates—he's worried about his inexperience with power jobs and also about the cost. Since gas models are generally conceded to be the most advanced form of model building, he may come to the mistaken conclusion that gas model construction is only for the most expert and experienced builders.

As for the cost, our gas model prospect has heard that the average outlay for gas models is about \$35—all of which goes up in so much smoke if the ship is not properly designed and balanced.

Fortunately, however, we can assure you that the trend is now away from the complicated airplane structures which demand so much extreme expertness on the part of the builder. Smooth, clean ships which are simply made have already replaced the old "flying box cars." And best of all, the trend in the gas job field is definitely a way from high costs.

The Flying Aces Stick Gas Job was designed to be as simple as possible, and at the same time to be strong, stable, and capable of flights of good duration. We built this model at a minimum expense, yet the



In this photo, the simplicity of the ship's structure is well brought out. There's not a single complication to "stump" you in building her. In fact, a lot of replica, rubber-powered models are harder to construct.

completed ship fulfilled our highest expectations. More than one hundred flights were made, each ending with a perfect landing. The plane always takes off after a very short run, and it has climbed steadily in each flight until the engine "faded out." In the return journey, its glides are smooth and flat.

It only costs a few dollars to build the Flying Aces Stick Gas Job, and it's as easy to build as a good rubber powered model—in fact, easier than many of the rubber motored replica craft. Above all, this gas model will give you real experience in building and flying powered craft. Okay, then. Let's get started—

THE MOTOR STICK

THE motor stick is the backbone of the plane and should be constructed first. The outline of the motor stick is laid out, according to the dimensions on the plans (see following pages), on a smooth board. The $\frac{1}{4}$ " by $\frac{1}{2}$ " spruce longerons are bent along the outline and the cross members are cemented in place with model cement. After the cement has dried, small holes are drilled in the longerons, using a brad as a drill. Two $\frac{3}{4}$ " brads are nailed in each cross member.

The two longerons are cemented together in the rear, and a balsa gusset is used for strengthening. The motor mount is simply two pieces of $\frac{1}{4}$ "-thick plywood which are glued together and cut out to fit whichever motor you use. Drill small holes and insert $\frac{1}{2}$ " round-head wood screws to further secure your mount.

LANDING GEAR AND WING MOUNT

THE landing gear is bent from $\frac{3}{32}$ " diameter steel music wire. It is made in two pieces, according to the dimensions shown on the plans. The bottom of the landing gear is bound together with copper wire and soldered.

Care should be exercised in bending the landing gear. Make sure that one side is not longer than the other, and that all the angles are equal. The finished landing gear is bound to the longerons and cross members with copper wire. We recommend $3\frac{1}{2}$ " pneumatic wheels for the model, but if you find the expense is too great, home-made wooden wheels, will serve the purpose.

The wing mount is also bent from $\frac{3}{32}$ " diameter steel wire and then bound to the fuselage and cross members.

Note that the front brace is $\frac{5}{16}$ " higher than the rear in order to give the proper amount of incidence to the wing. Two $\frac{3}{16}$ " by $\frac{1}{2}$ " spruce wing supports are then bound securely to the mount with soft copper wire.

TAIL ASSEMBLY

OUR tail surfaces are all-balsa in construction and are built to the dimensions shown. The leading edge

Gas Job

is rounded, and the trailing edge is tapered. The tips are $\frac{1}{4}$ " sheet balsa. All the $\frac{1}{8}$ " by $\frac{1}{4}$ " tail ribs are spaced 2" apart. After the tail surfaces are covered, they are cemented firmly to the motor stick.

WING

THE wing is, of course, one of the most important parts of the model. It should be built with extreme care and precision. A warped wing will give you all kinds of trouble when flying the ship. First, cut out all the wing ribs, twenty-one in number. For accuracy it is best to cut out a metal or plywood template of the rib for a guide.

Front and rear wing spars are constructed next. The center section portion of the spars is filled in with $\frac{1}{8}$ " sheet balsa filler block, as indicated on Plate 4. The distance between the upper and lower wing spars should be carefully measured from the rib template. A $\frac{1}{16}$ " sheet balsa cover plate is cemented to the outside of the spars and allowed to dry for at least thirty minutes. After the cement has dried, mark off the location of the ribs on the spars. Slide the ribs between the spars and cement. Be sure that the ribs are square with the spars. It will be necessary to cut the center rib into three pieces because of the filler blocks.

Next, the leading and trailing edges are planed, sanded to shape, and cemented in their respective notches. The tips are constructed of two plies of $\frac{1}{8}$ " sheet balsa. The grain should be crossed at an angle of about 15° . The spars are cracked 6" from the tip and brought together to meet at the tip. The cracks should be well cemented. The last rib is smaller than the others and should be attached as shown on the perspective drawing. The wing is attached to the wing mount with 6 to 8 strands of $\frac{3}{16}$ " rubber. The rubber should be tight enough to prevent the wing from lifting off the plane while in flight.

COVERING

WING and tail surfaces are covered with bamboo paper after the center section of the wing is first covered with $\frac{1}{32}$ " sheet balsa. The grain of this balsa

Fans, it's not difficult at all to get your start in the gas model field—and FLYING ACES proves it right here by offering you an easily-built, low-cost gas job. Just as the stick model has always been the stepping stone for beginners in the rubber-motor field, you'll find that this sleek, stick-typer is just the ship to lead off with in the power class. Yes, she looks **mighty good**—and she's just as good as she looks!

should run in the very same direction as the spars.

Sand the joints smooth and cover with bamboo paper. Covering gas models with bamboo paper is easier than covering rubber powered models with tissue paper. Here are a few helpful suggestions: Apply it to the framework (with cement) in pieces as large as possible; moisten the covering by spraying with water; and allow it to shrink overnight.

A good color scheme is an important part of your ship. Models have often been lost because of poor visibility against natural backgrounds. Avoid painting your ship dark blue, green, gray, or black. Our original Flying Aces Stick Gas Job was painted light blue and orange. This combination offered a contrast against the sky and landscape. Striping tape should be used to obtain even lines when painting the "sunburst" we used. The model need not be coated with clear dope.

MOTOR INSTALLATION

ANY of the reliable gas motors can be used in the model as long as the total weight of the plane does not exceed $2\frac{1}{2}$ lbs. With our Baby Cyclone, the ship weighed $1\frac{3}{4}$ lbs., and with our Brown Junior it weighed slightly under 2 lbs. A small toggle switch should be placed in the circuit to prevent short circuits when the engine is not running.

The motor installation will vary with the type of engine used. If your motor is of the gravity feed type, a small box should be built from $\frac{1}{8}$ " sheet balsa in order to raise the tank above the engine.

The engine should be wired as in the diagram. The batteries are placed in the battery box, which

is constructed from $\frac{1}{16}$ " Birch plywood with $\frac{1}{8}$ " Basswood ends. Brass contact plates are fastened to each end of the box with pins. The spring at the negative pole (zinc cover of battery) is bent from .034 music wire and should be sufficiently strong to make a good contact. All wiring connections must be cleaned and firmly soldered. This is absolutely necessary for the

(Continued on page 95)



Aloft!



The take-off.

Gas Model Clubs!

Gas Model Flyers!

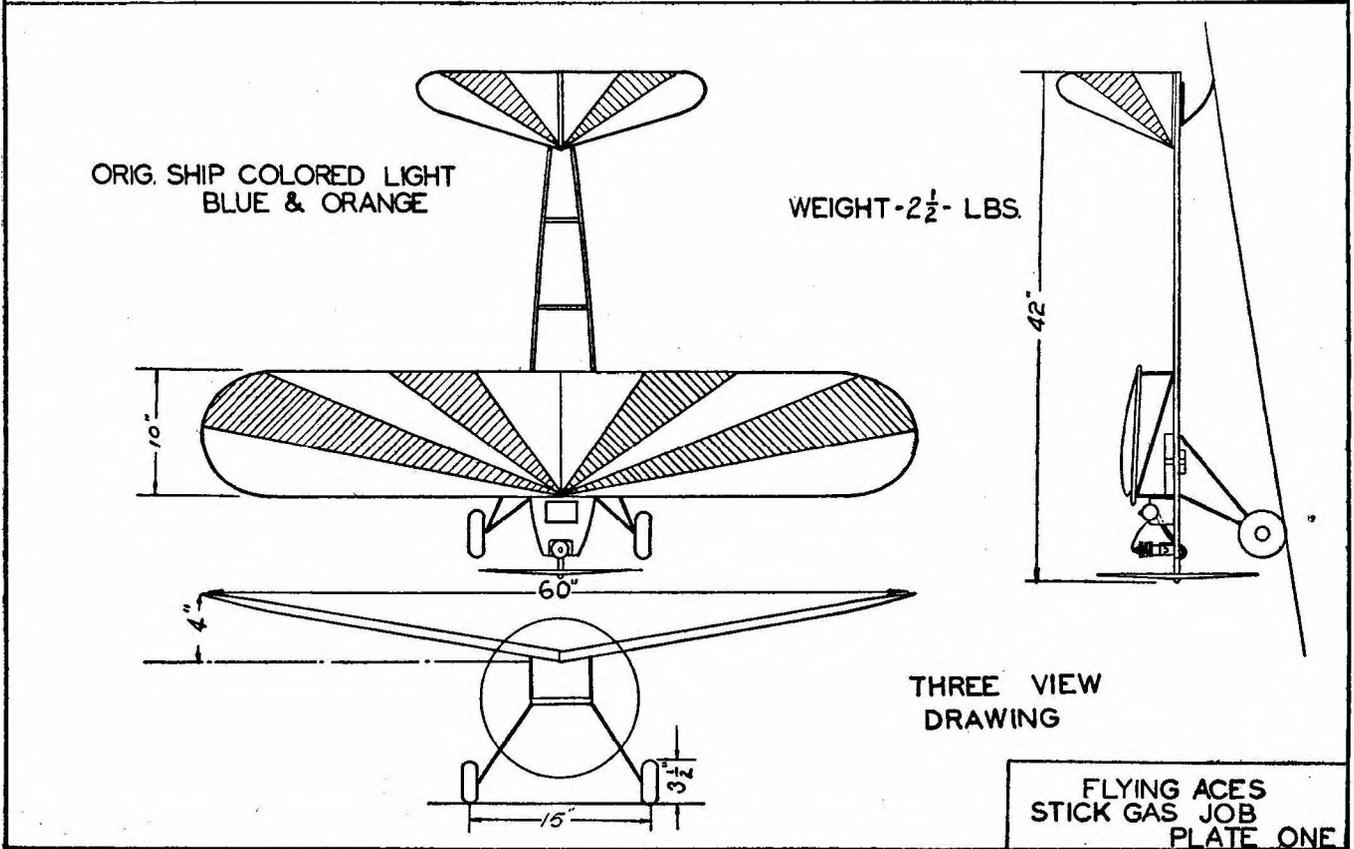
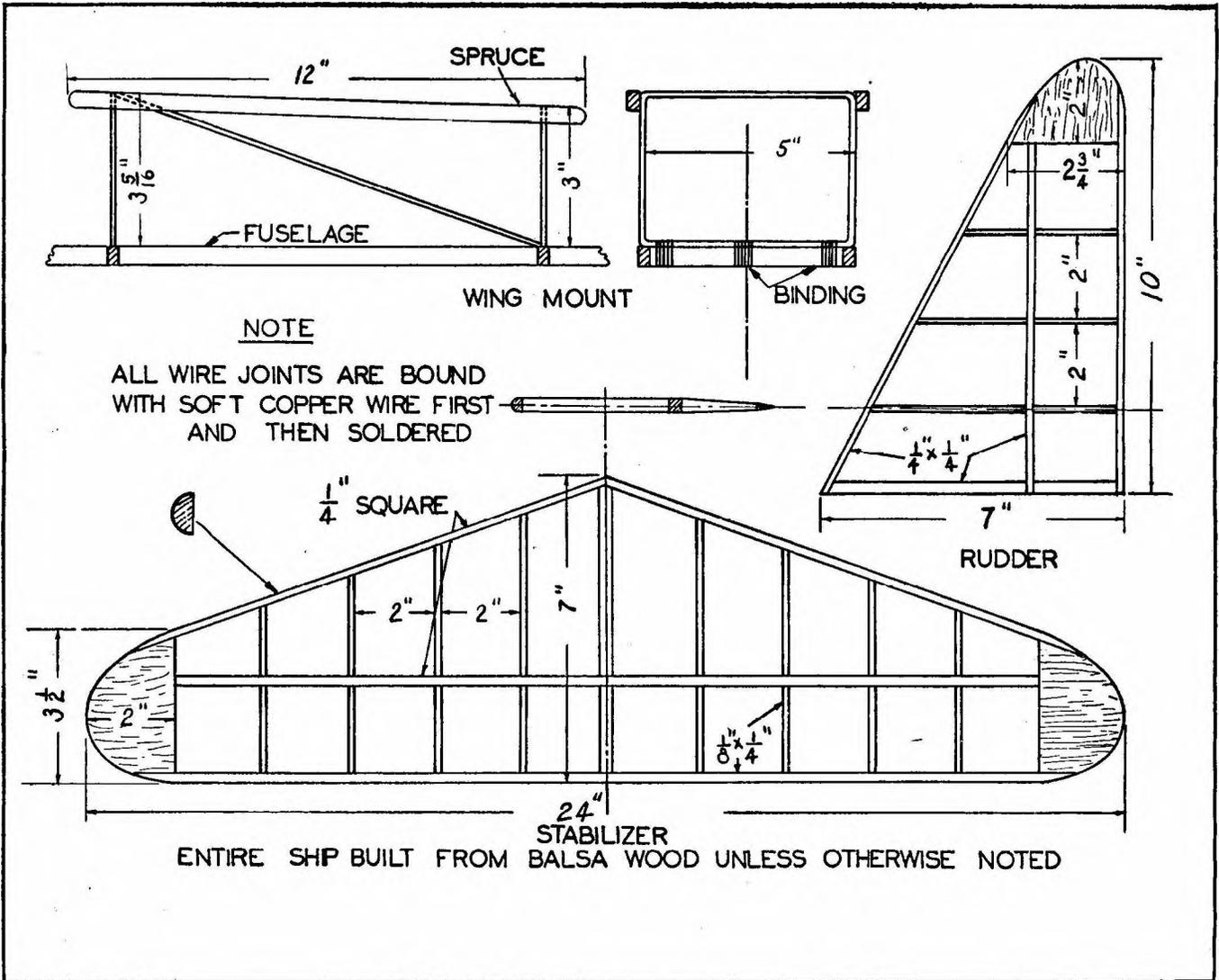
REGISTER WITH FLYING ACES!

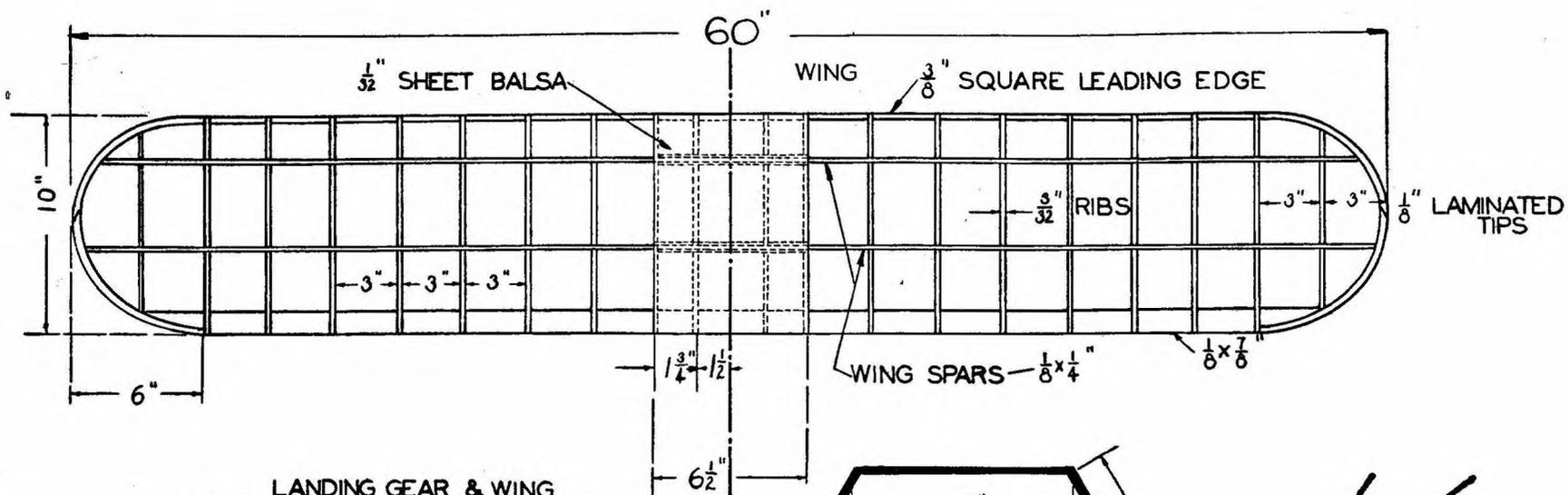
DO you belong to a gas model club? If you do, drop us a letter telling all about it—the name of the club, the number of members, your various activities, etc. On receipt of your letter, we'll officially register your gas job club with FLYING ACES. And that will mean that news of your club will appear regularly in this maga-

zine. Address all letters to The Gas Model Editor, FLYING ACES Magazine, 67 West 44th St., New York City.

If you're an unaffiliated gas model flyer, write us, too—for we want to register lone eagle gas jobbers as well as clubs. And if you want to start a club, we'll tell you how. Okay, fans? All right, let's go!

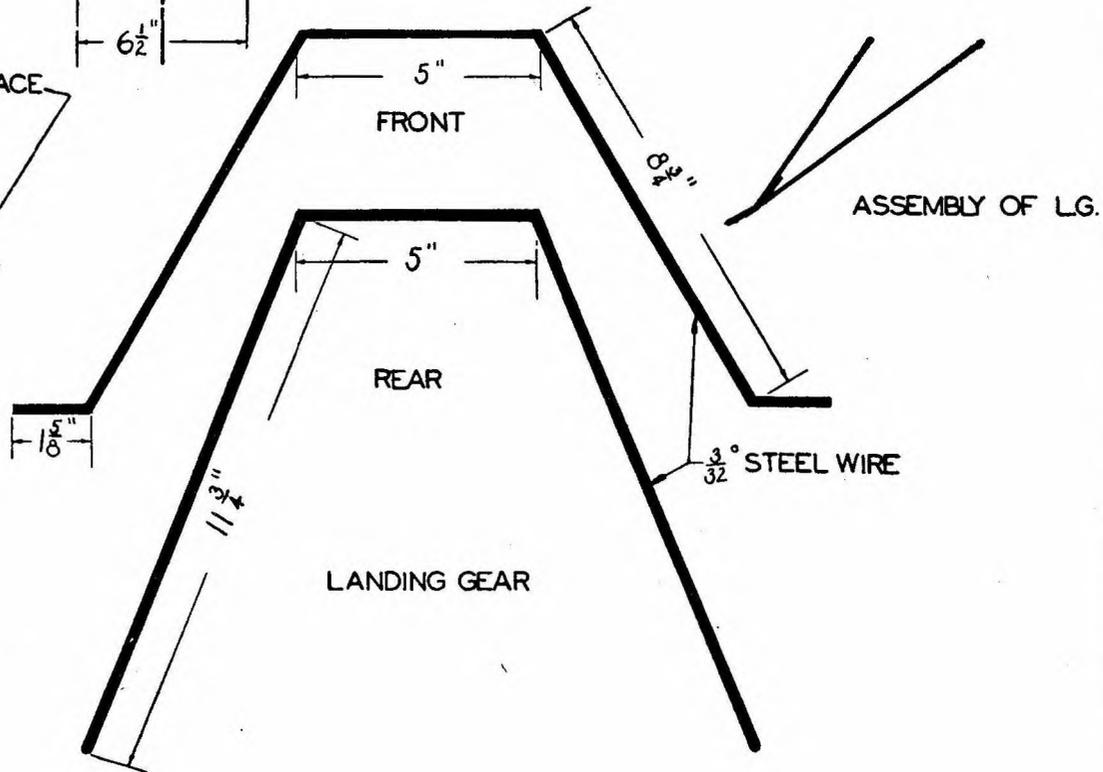
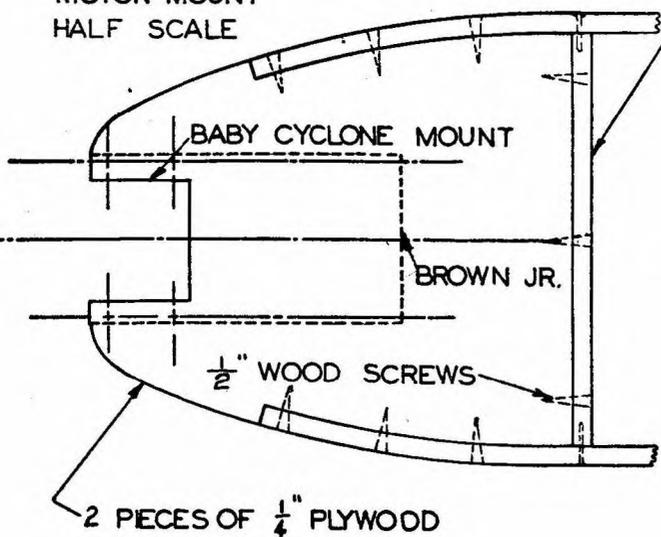
THE FLYING ACES STICK GAS JOB—Plate 1





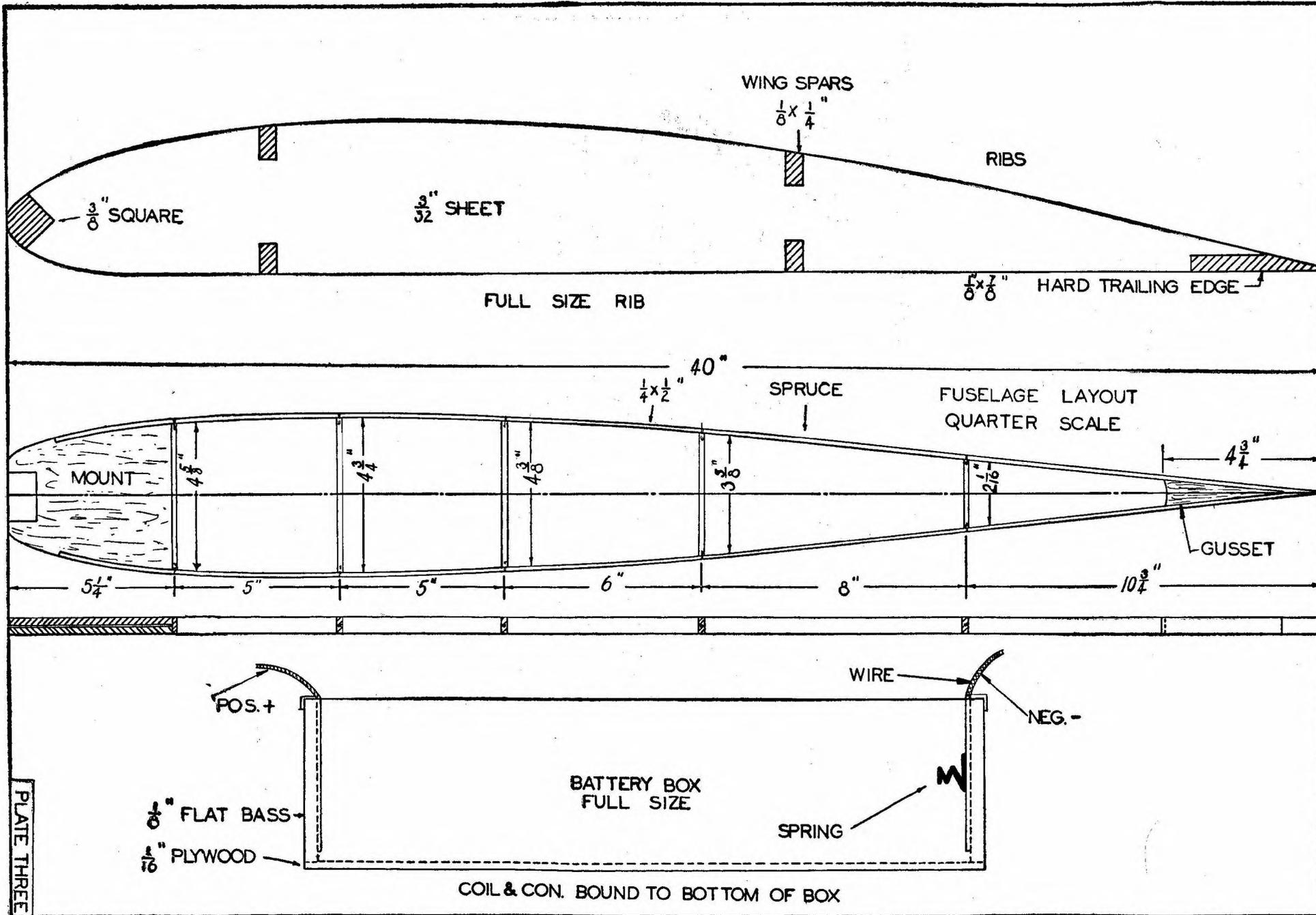
LANDING GEAR & WING MOUNT ARE BOUND TO THIS BRACE.

MOTOR MOUNT HALF SCALE



[39]

PLATE TWO

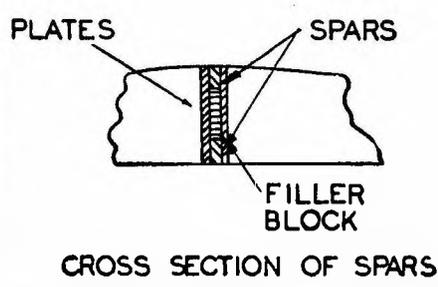
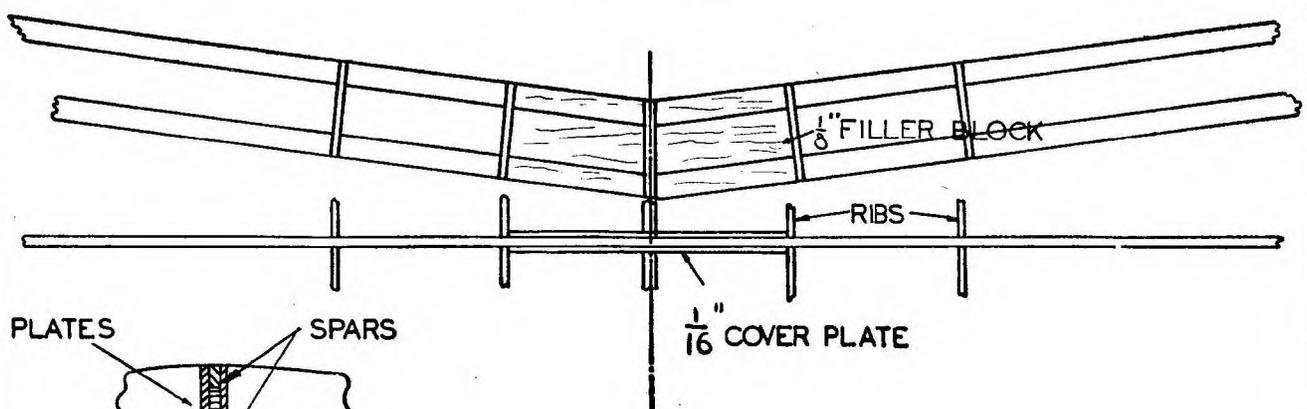


[40]

PLATE THREE

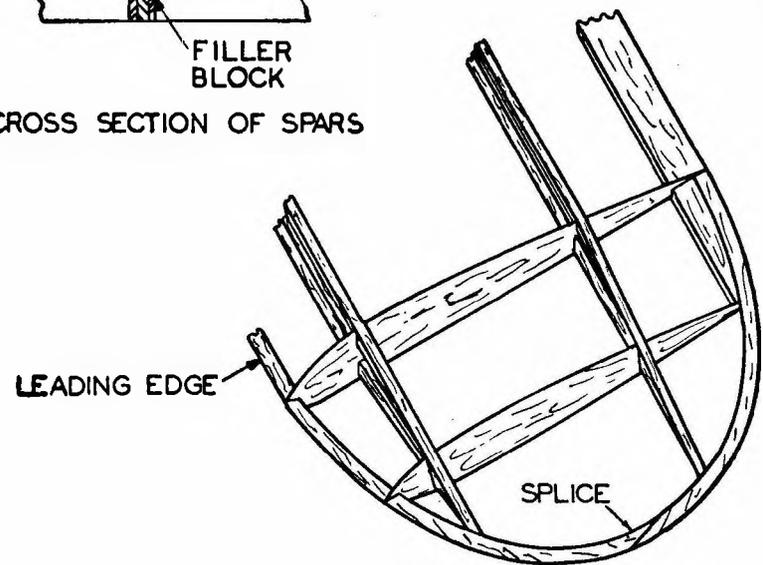
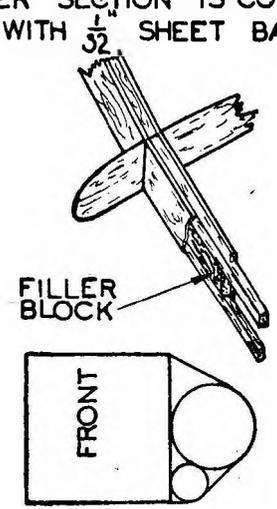
THE FLYING ACES STICK GAS JOB—Plate 4

CENTER SECTION

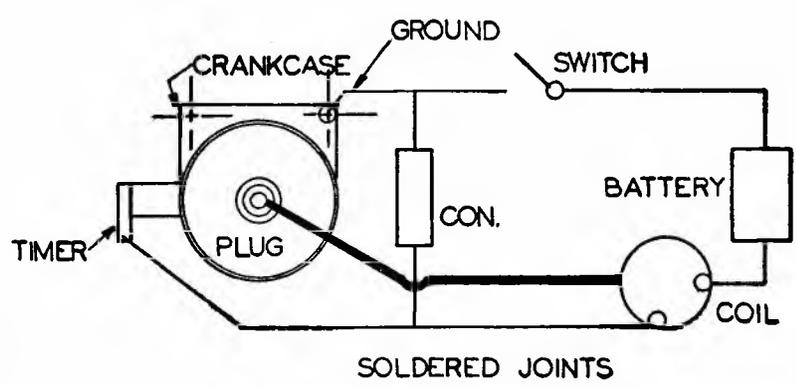


CROSS SECTION OF SPARS

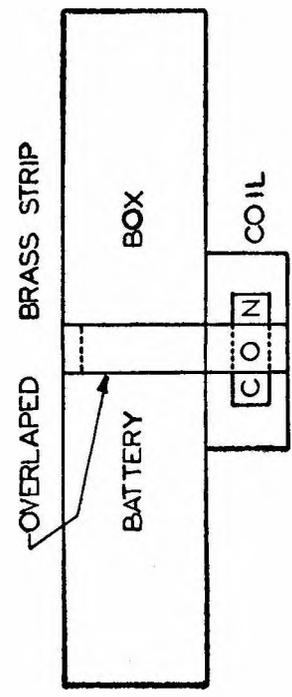
CENTER SECTION IS COVERED WITH $\frac{1}{32}$ " SHEET Balsa



WING TIP



WIRING DIAGRAM



ASSEMBLY OF COIL & CONDENSER

Something Novel!

A Model Parachute Pack

Here's a special treat for you—full instructions for making a tiny seat-pack 'chute. It looks exactly like the real thing. And after you've glanced over Mr. Kruse's drawings on the next page, you'll be saying, "That's certainly one swell idea. I wonder why someone didn't think of it before!" And now, let's go to it—

By Don Kruse

DID it ever occur to you that parachute packs would make good model subjects? Being "hepped" on the idea that realism can be achieved on one's model tarmac in more ways than one, we took a try at it. And the result was so satisfying, that we're passing our model Irvin seat-pack parachute on to the readers of FLYING ACES. You'll find it a mighty bright little addition to your group of aero models; and if you're one of those fellows who makes pilots out of modeling clay, you can fit this 'chute pack onto your tiny airman.

You won't need many materials for your parachute pack—simply a small scrap of khaki, nine straight pins, a short length of copper wire, a scrap of stiff cardboard, a short length of No. 8 white thread, a small amount of cotton, and a sheet of good bond paper. Our parachute pack (see drawings on next page) is made to the scale $\frac{3}{4}$ " equals 1 foot; but you may alter this size to suit your own individual needs. You will note that this pack does not open—but if you use your ingenuity, you may hit on a way to put a real working-model 'chute in your pack.

We start the construction by cutting from the khaki cloth, all pieces marked with a "K." Next cut a piece

1 $\frac{1}{4}$ " by 1" from stiff cardboard. From the same material, cut to size the two small cardboard stiffeners. These three pieces may now be glued in their proper places on the pack. The pack is now turned over and the thread glued in place, gluing only the ends. A strip of bond paper, 1/16" wide, may now be glued on the edges of the two pointed ends as indicated. The protector flap, J, may now be made as illustrated. Now place the pack wrong side up. On the cardboard place a small ball of cotton that you think will fill the pack. Now draw the two large flaps closed and glue. When the glue is dry you may glue closed the two pointed flaps taking care to smooth out any wrinkles. You may now glue the piece "J" in place. Next make the harness using several strips of bond paper glued together for the straps. Now glue in its proper place on the harness the piece "B." The pocket may now be glued around the rip-cord ring which may in turn be glued on the piece "B." All the fittings may now be glued in their places. Now glue the harness to the pack. The seat cushion can now be filled with cotton and glued in its proper place. Next bend the wire rip-cord housing to shape indicated, cut to size, and glue in place. This last step finishes the pack.

From the Model Builder's Workbench

LAYING OFF STRUTS

MANY three-view scale drawings do not show the actual length of the landing gear. That is, the landing gear struts sometimes join the fuselage at two different angles—forward or backwards and sideways. In that case, the front view or the side view separately will not show the actual length of the landing gear struts.

The thing to do is to join the front view and the side view.

To do this, measure off with a ruler the length of the landing gear struts on the front view. The usual landing gear strut arrangement is in a V form. On the side view from the point where the front strut of this "V" joins the fuselage draw a line down at right angles to the line of thrust equal to the length of the measurement taken from the front view. From the bottom of this line construct another line at right angles to it. Now, from the point where the rear strut joins the fuselage, draw another line at right angles to the line of thrust down until it meets the line which you drew at right angles to the front line.

You will then have a rectangle the actual length of the landing gear strut. The fuselage longeron may have an ex-

treme curve and the rear strut may be higher than the front one—but this makes no difference.

If the front strut is straight, continue it down to the bottom of this rectangle. Then draw the rear strut from the point where it joins the fuselage to the bottom of the nearly constructed front strut. This will give you the correct length and angle.

In case the front strut also has two

angles, measure from the side of the rectangle to the bottom of the struts on the side view. Then measure off this distance on the bottom line of the rectangle from the front line and mark a point there. Construct the two struts to this point. Again you will have the correct length and angle.

This method can also be used to lay off wing struts with two angles. Try it, and you'll agree it fills the bill.

—THOMAS MCGARRY & GLENN TASSIE.

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 is made for accepted plans.

●

SIMPLE FLIGHT TEST

TO see if their models will fly, some model builders glide them. But most of the time if the model is unproperly balanced the plane may crash.

The following test enables you to see if your model flies—without the danger of crashing.

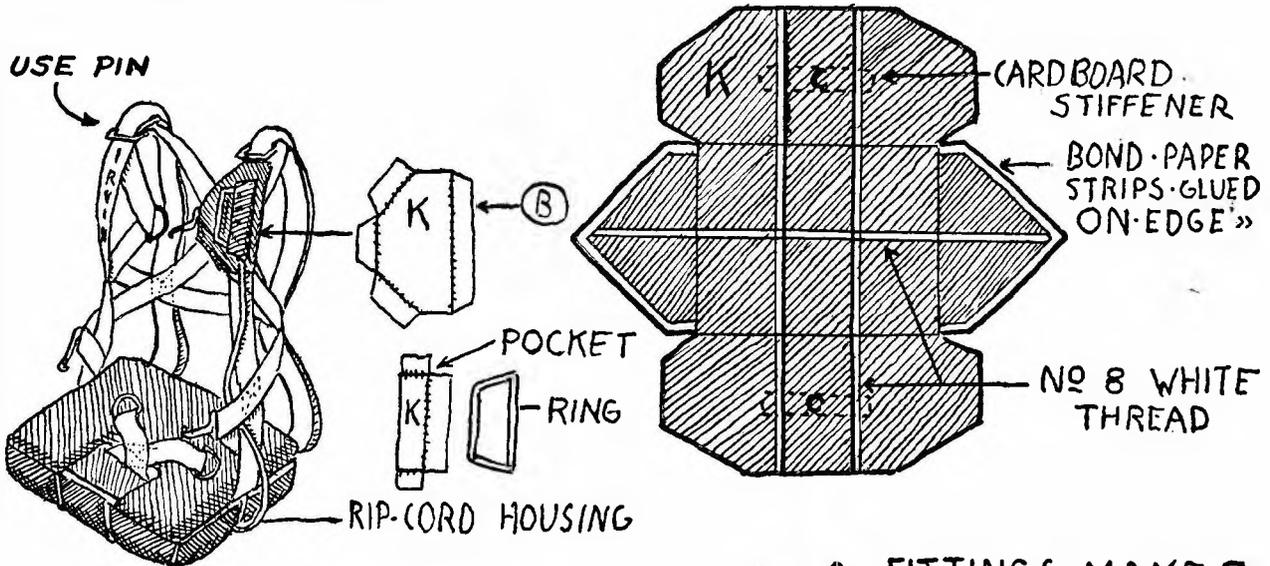
Set the model on the floor and lift tail to flying position. Then give model a good push forward. If the model hops off the floor (as though taking off) and makes a nice landing you can be sure that your model will fly. If the plane zooms bend the elevators down. If the model noses over bend the elevators up. You will find that this test hardly ever fails.

—DAN PATTARINI, JR.

PARACHUTE

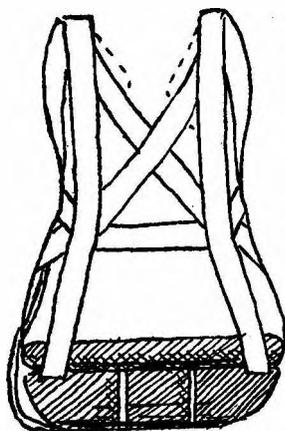
SCALE 3/4" = 1'

ADD REALISM TO YOUR PLANE DRAWING IS EXACT SIZE

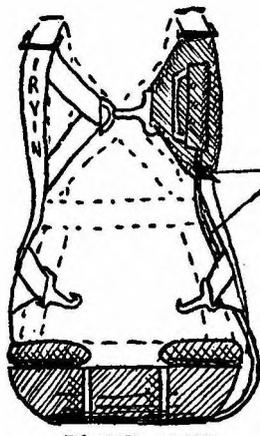


ALL CLOTH IS KHAKI
MAKE HARNESS OF BOND PAPER

D - FITTINGS « MAKE 3 EACH AND GLUE IN PLACE. (PINS MAY BE USED TO MAKE THEM)



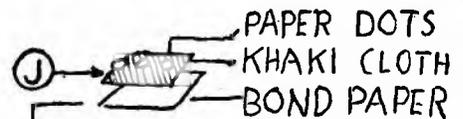
BACK VIEW



FRONT VIEW

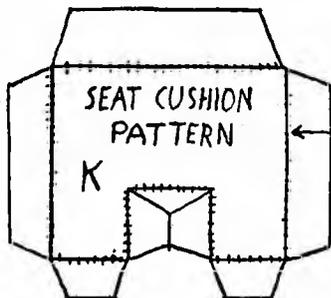
- RIP-CORD MAY ALSO BE MADE FROM PIN PAINTED YELLOW »

RIP-CORD HOUSING IS MADE FROM COPPER WIRE PAINTED SILVER

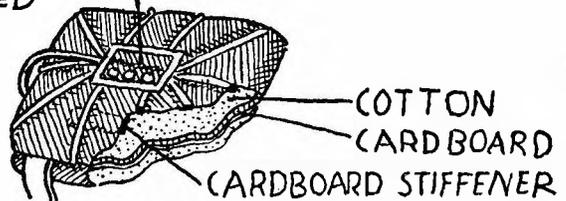


J

ALL JOINTS ARE GLUED



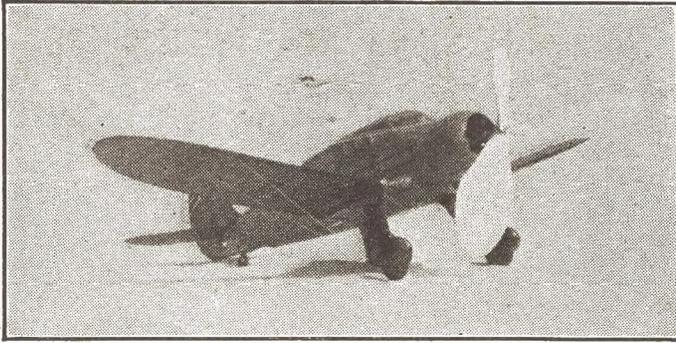
FOLD ON KRISS-CROSS LINES - CUT ON SOLID LINES



PACK AND CUSHION ARE STUFFED WITH COTTON



Plenty sweet—and no foolin'! Yes, sir, the Kinner Envoy model packs the beautiful flying lines every model builder seeks. And she boasts all those at-home-in-the-sky qualities that make a ship first choice on the model tarmac!



Remember that song—"Just Like a Melody From Out of the Sky"? Well, here's a flying model that's just like a melody into the sky as well as out of it! This snappy C-7's got everything, fans. So clear your production lines for action!

Build the Kinner Envoy

By Felix Gutmann

THE 1936 Kinner Envoy is a trim, four place machine with many improvements over the old model. At first glance one can see that the cabin windshield slants back from the bottom whereas that on the old model slanted the opposite way. The general performance is better due to the improved streamlining. The engine used is a Kinner C-7 which develops 300 h.p. at 1800 r.p.m. The plane weighs 4,000 pounds gross.

The model presented here is a close copy of the prototype with the exception of larger tail surfaces, larger propeller, and longer landing gear. The engine on this model is very realistic due to the crankcase which is a copy of that of the original engine. In all, the model provides a very trim appearance, with flights to match. The climb is quite steep and rapid and high altitudes may be obtained on sunny, semi-calm days. Of course, the warmer the day the better the possibilities for topnotch flights.

BUILDING THE FUSELAGE

IT is advisable to make all the bulkheads first. The majority are made of 1/16" sheet balsa. A few near the nose are cut from 1/4" by 3" sheet stock. Note that the bulkhead used to hold the tail hook is comprised of three parts glued together, (see Plate 4). When the bulkheads are finished make two master longerons (shown in black on side view). They are of 3/32" square stock and on them mark in pencil the divisions between the bulkheads. Make one longeron exactly like the other. Now clamp them together at the tail end and starting from the nose, assemble the bulkheads in order along them, cementing in place right away. When these are dry, the rest of the stringers may be assembled. These are all of 1/16" square stock. Note that the cowling (indicated in Plate 1) is independently built from the main body with separate master longerons. Note that bulkhead E is fitted with plugs, as shown in Plate 2, and bulkhead D has small holes to fit these plugs.

This set-up permits a removable cowling, which in turn permits the stretching of the rubber when winding. It is best not to glue A & B onto C until the finished motor is glued in place on C.

THE MOTOR

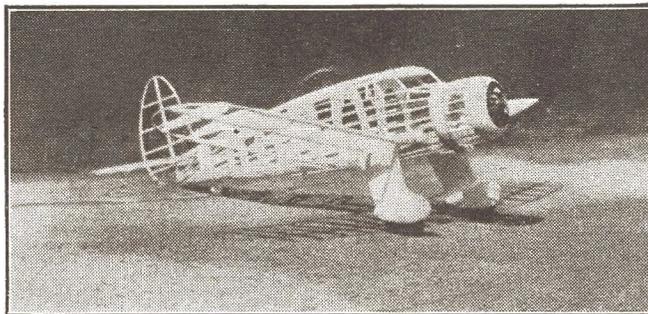
THE crankcase is carved from a single piece of balsa with the grain running from the nose back. It is very simple to make. First cut a heptagonal (seven-sided) prism shape of required thickness and diameter.

Then make a circle of the diameter of the hardwood nose-plug to be later fitted in that place. Make seven radiating lines from the center. Then cut the angles as shown.

The main gusset plates are easily cut now. Leave them about 1/16" thick. Then the intermediate gusset plates are made of index file card, or the equivalent, and glued in place. A circular hole is now cut in the center to accommodate

the plug of the hardwood nose piece, which is then glued in place. Seven cylinders are made of 1/4" strip, rounded, and wrapped with heavy thread. The cylinders are now glued in place and when dry the whole motor should be glued onto the 1/32" disk which fits into bulkhead B. This is now glued onto C and the cowling fitted over that, as shown in the side view. The whole motor is now given two good coats of black paint which should leave the crankcase with the desired gloss. A bushing may now

(Continued on page 93)



This picture tells the "inside" story. Excellent skeletal workmanship makes the Kinner model tops, and Mr. Gutmann's clear-cut instructions enable you to get the same fine structure that features his original ship.



And now we twist 'er around to get a rear-quarter view. Note the wing fillet work, the tail rigging, and the built-in dihedral which gives the craft that anxious-for-the-air smack.

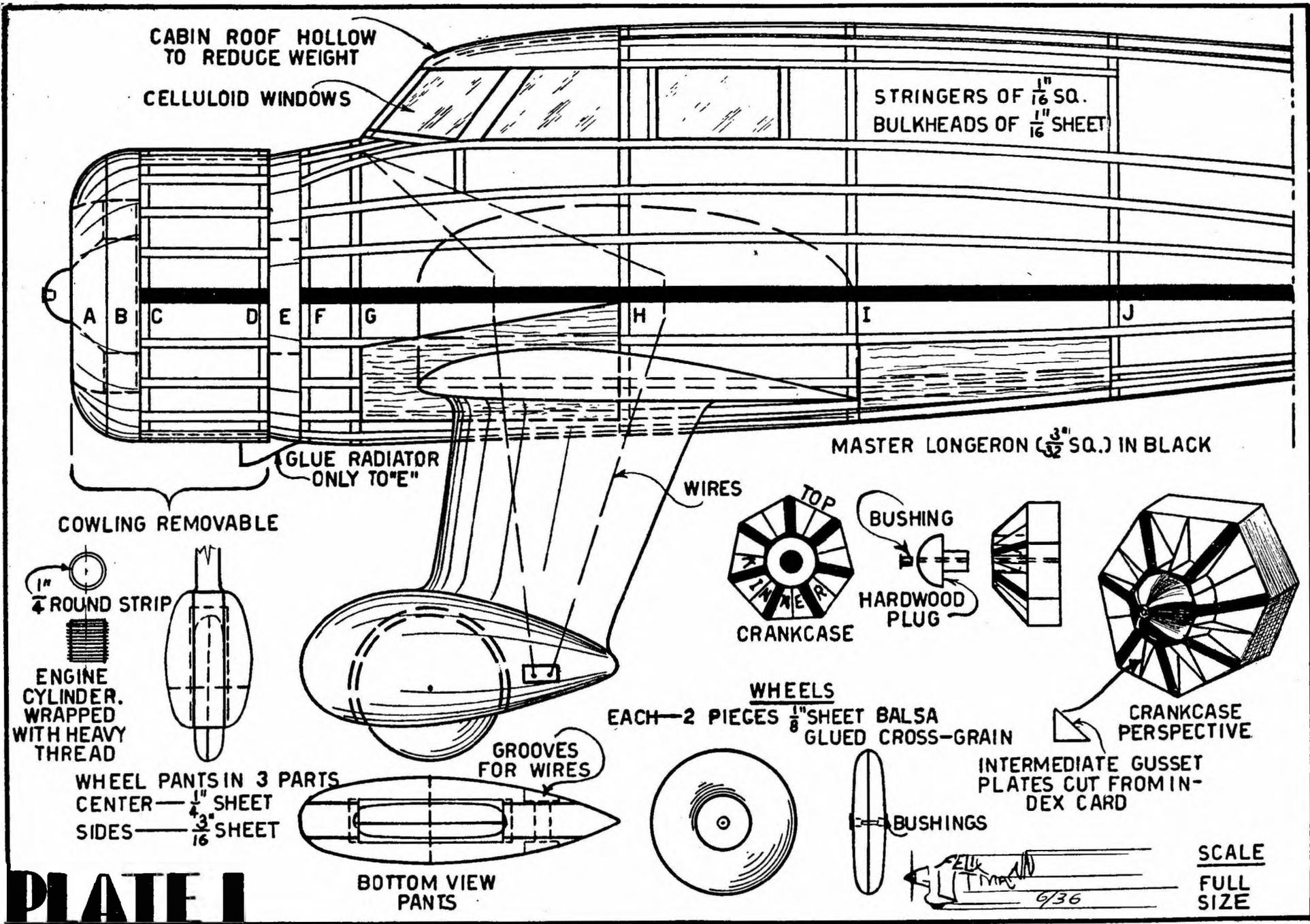
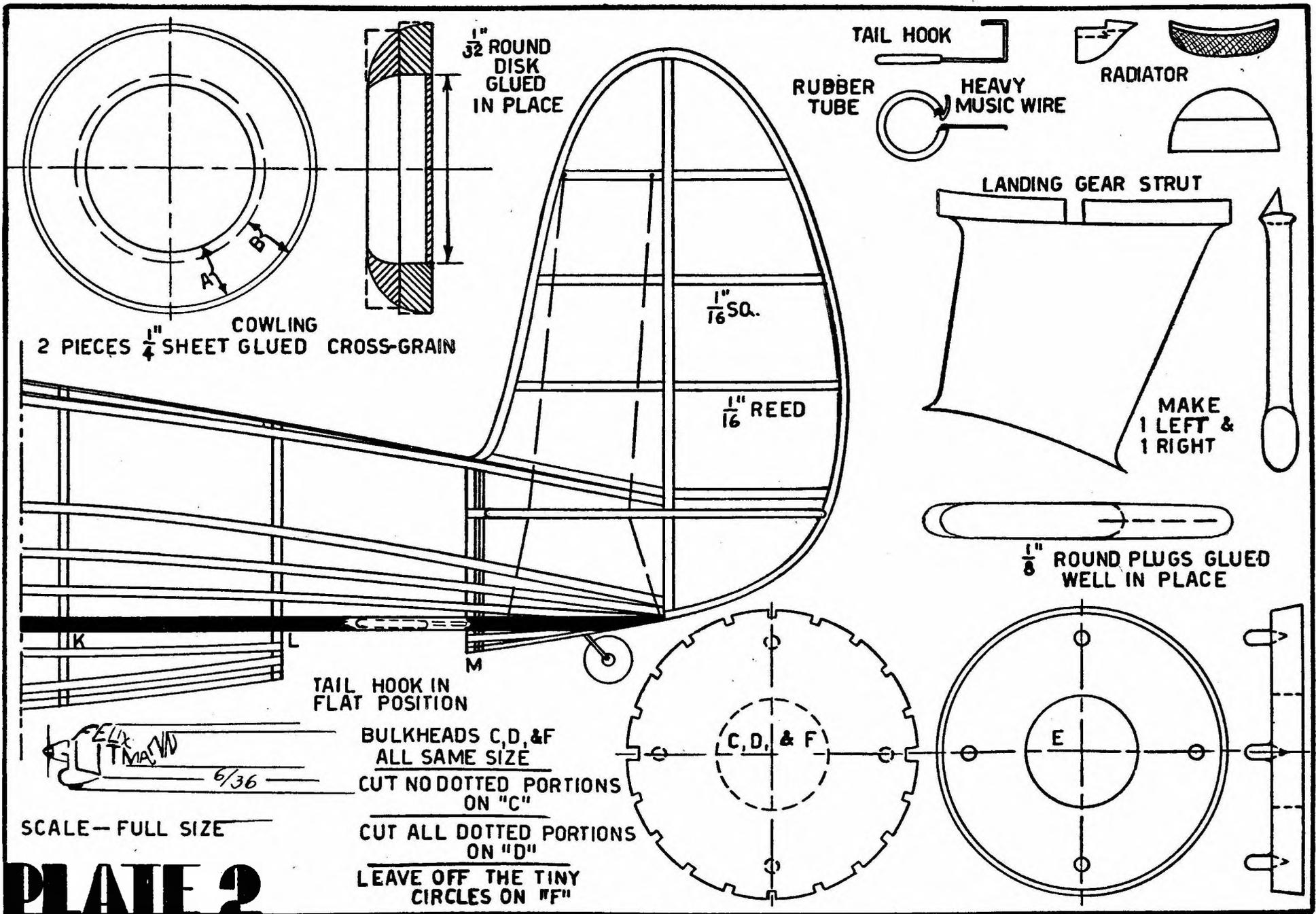


PLATE I



RIGHT WING (TOP)

$\frac{1}{16}$ " REED

$\frac{1}{8}$ " \times $\frac{3}{16}$ "

$\frac{1}{8}$ " \times $\frac{3}{16}$ "

$\frac{1}{8}$ " SQ. STRIPS
SEMI-ROUND-
ED & CHANNEL-
ED TO HOLD BRAC-
ING WIRES

$\frac{1}{16}$ " \times $\frac{3}{16}$ "

ALL RIBS OF
 $\frac{1}{32}$ " SHEET

TRAILING EDGE

$\frac{1}{16}$ " SHEET

MAIN RIB—MAKE 16

$\frac{1}{16}$ " REED

WIRES
THRU
HERE

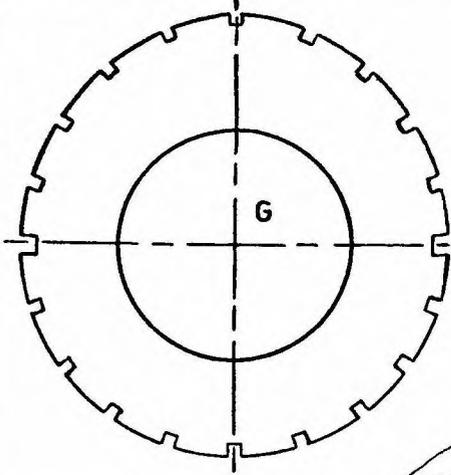
$\frac{1}{16}$ " SQ.

SCALE—
FULL SIZE

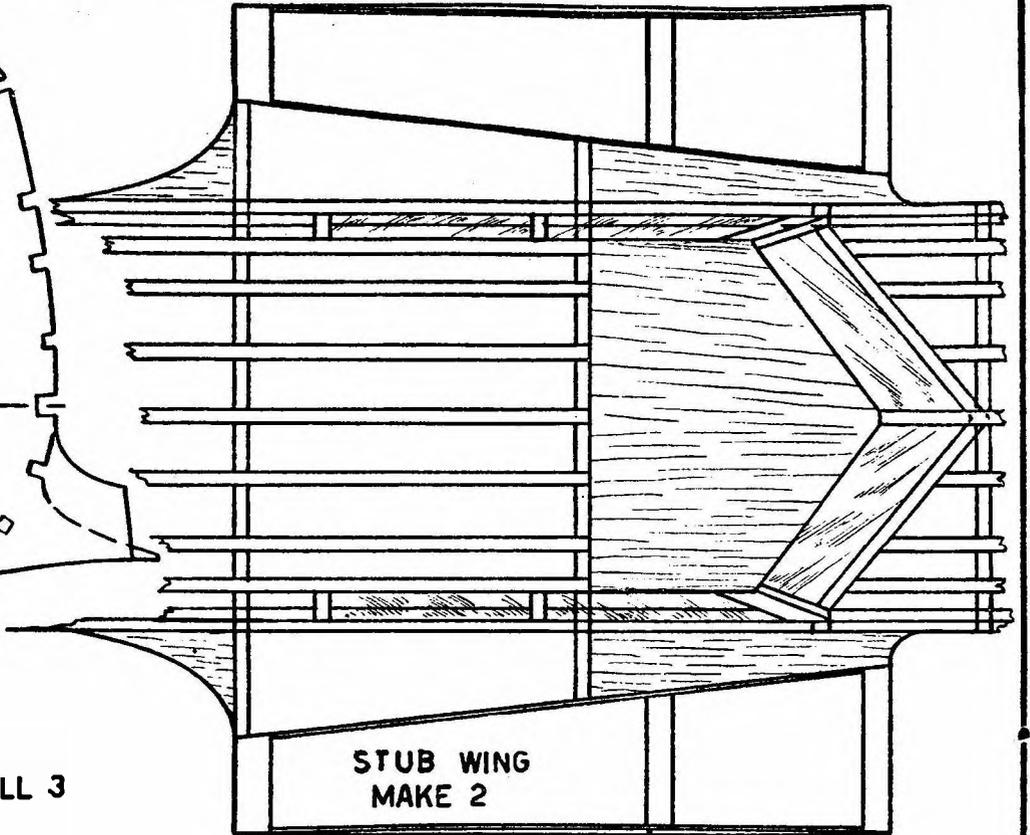
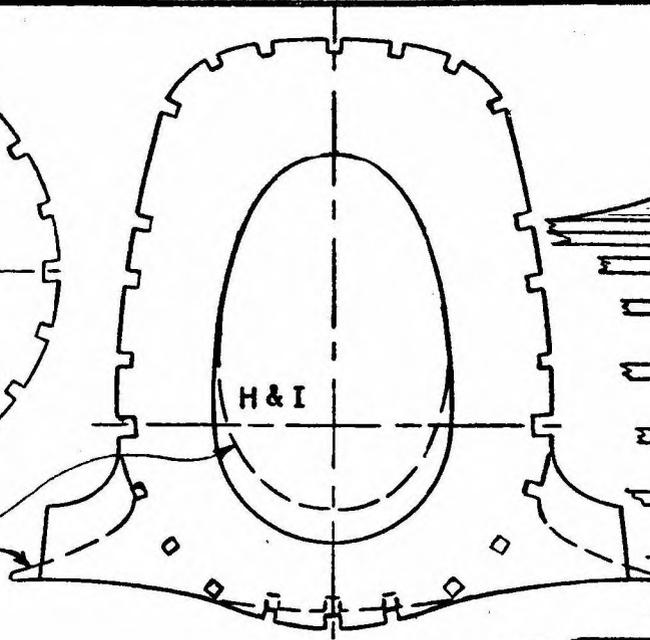
TIP RIB
MAKE—2

FELIX
S. (T.M.A.C.)
6/36

PLATE 3

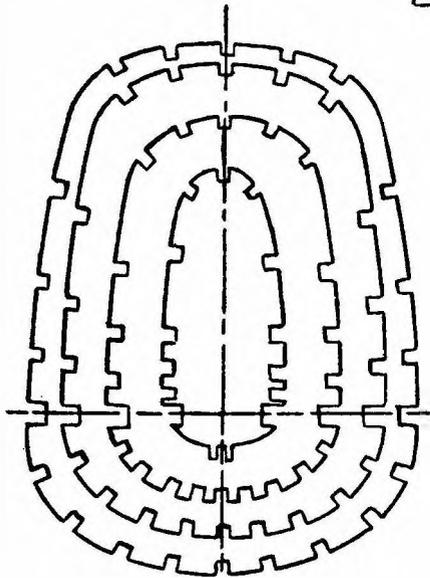


DOTTED LINES
FORM I OUTLINE

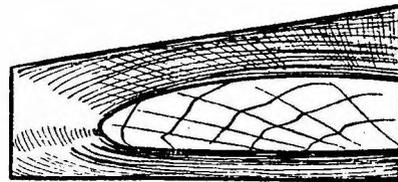


TILT END RIBS FOR DIHedral IN WING

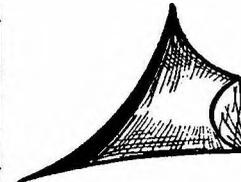
MAKE 3, M FORMERS
1 OF $\frac{1}{16}$ " SHEET } LAMINATE ALL 3
2 OF $\frac{1}{32}$ " SHEET }



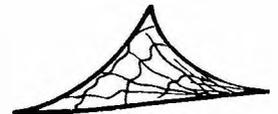
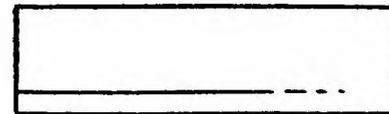
SCALE—FULL SIZE



FRONT WING FILLET
MAKE 1 RIGHT
& 1 LEFT



REAR WING FILLET
MAKE 1 RIGHT
& 1 LEFT

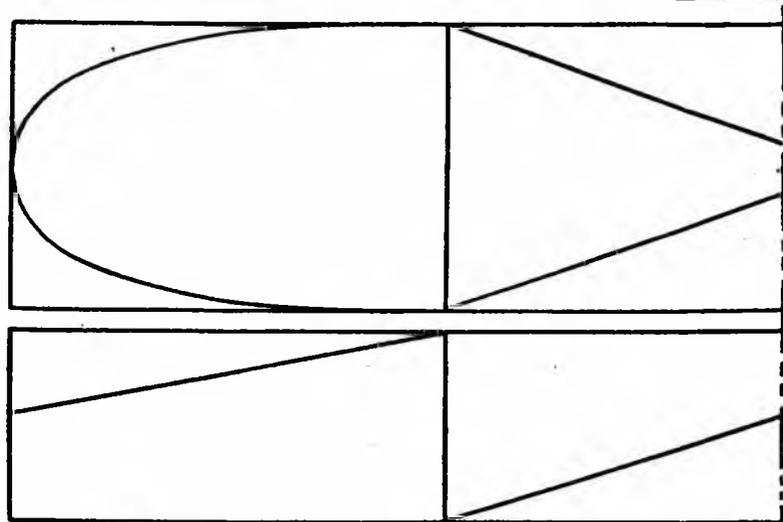


SLITMA

6/36

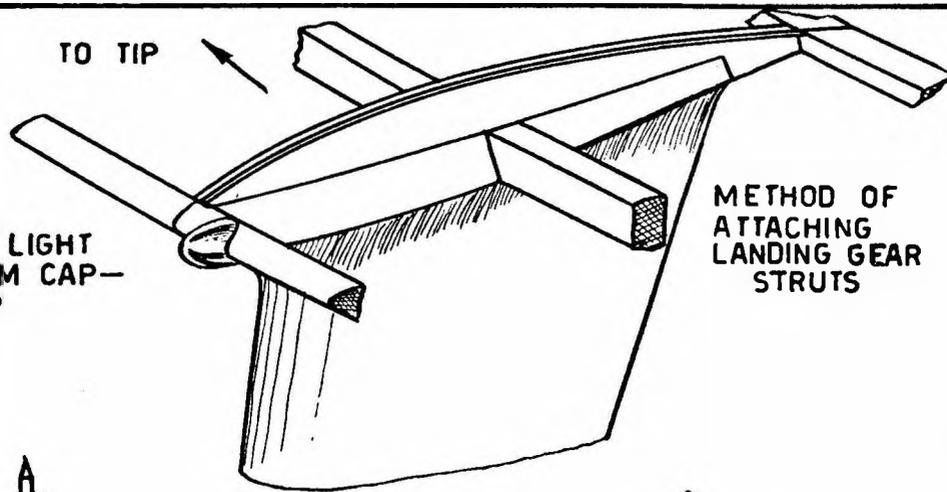
[48]

PLATE 4

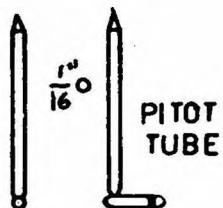


1/2 OF PROP. LAYOUT SHOWN
PITCH = 16.8"

LANDING LIGHT
CUT FROM CAP-
SULE TIP

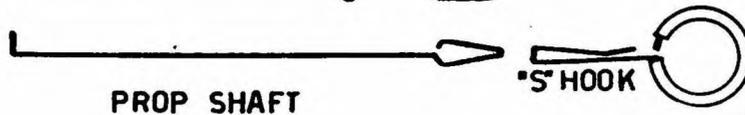


METHOD OF
ATTACHING
LANDING GEAR
STRUTS



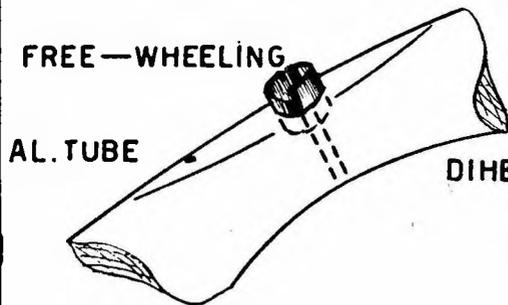
1/16"

PITOT
TUBE



PROP SHAFT

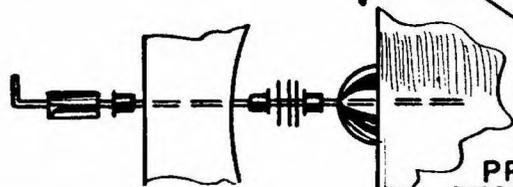
S HOOK



FREE-WHEELING

AL. TUBE

DIHEDRAL - 3/16"

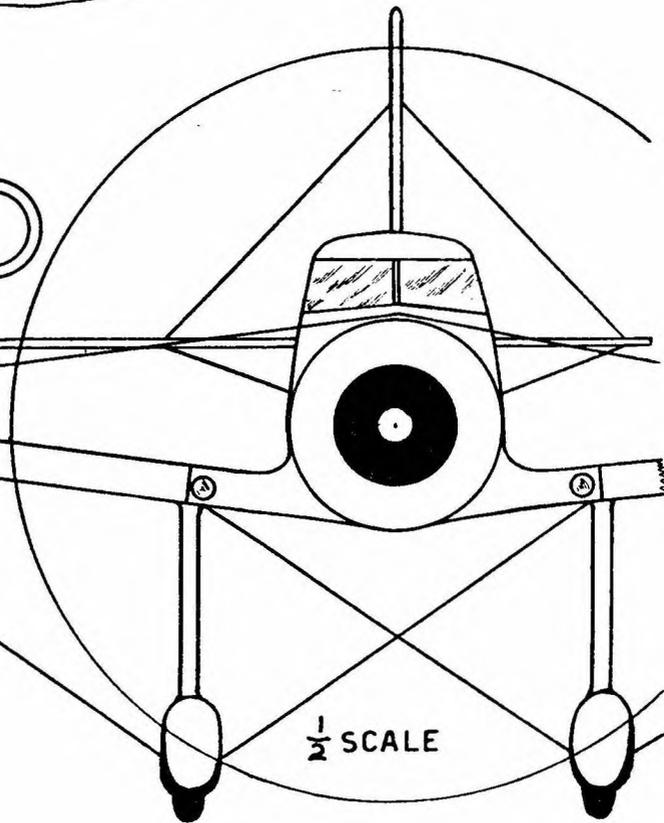


PROP
BEARING

SCALE-FULL SIZE

PLATE 5

WELLS
SULLIVAN
6/30



1/2 SCALE

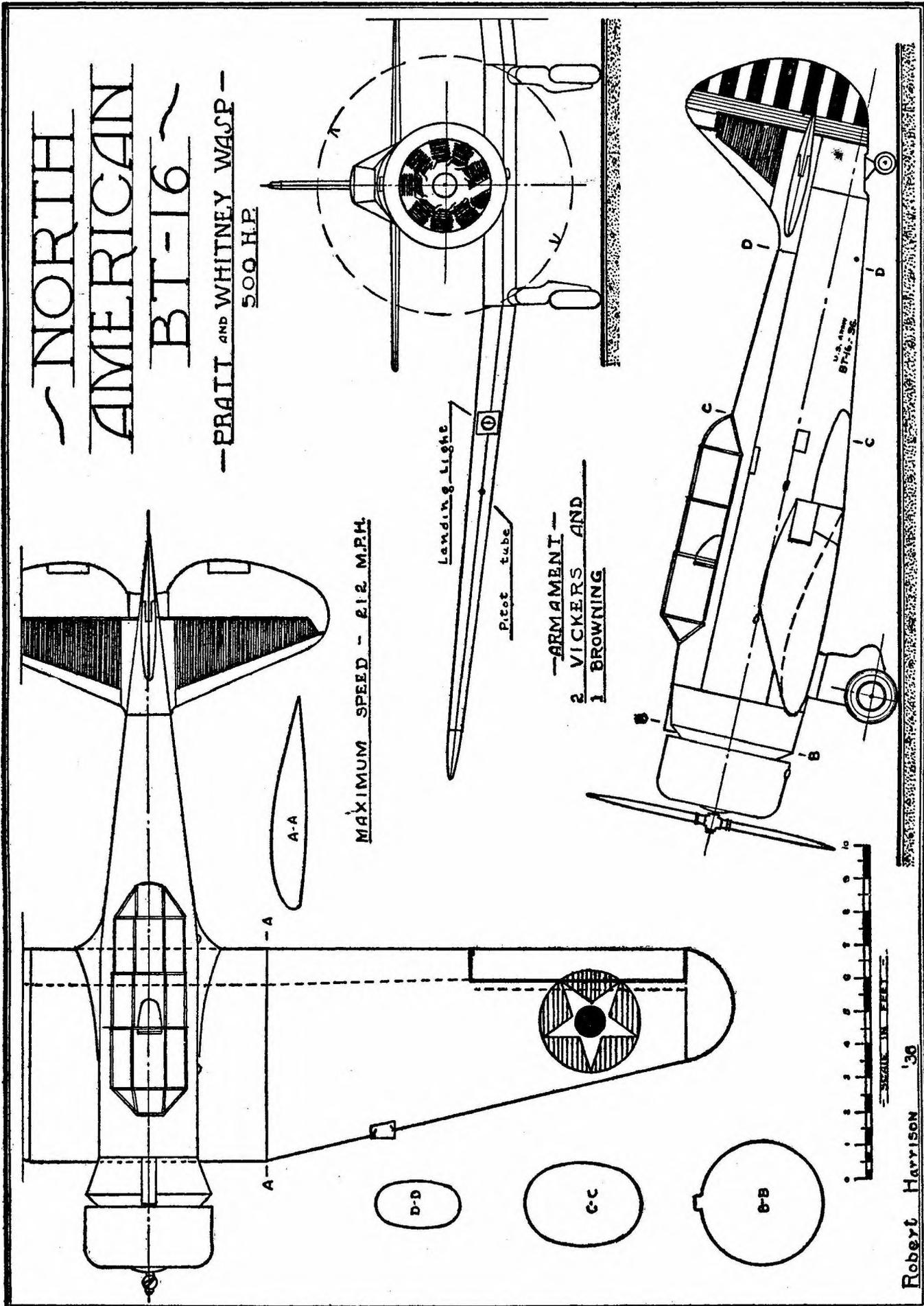
Try A Solid Model of the North American BT-16

NORTH AMERICAN BT-16

—PRATT AND WHITNEY WASP—
500 H.P.

MAXIMUM SPEED - 212 M.P.H.

—ARMAMENT—
2 VICKERS AND
1 BROWNING



The Streamlined Midget

Attention, stick modelers! Now that the school year is over, we're graduating you to a nifty balsa body job—one that you won't have a bit of trouble in making. You'll be able to wind 'er up to a fare-thee-well. And when you let 'er loose, she'll streak away at 'steen m.p.h.!

By Louis Garami

ARE you looking for a good, yet simply-made, flying model? Stop looking! Here it is right on this page, so gather your tools and balsa and get going on this excellent sky special. We especially present it for the stick fans, for it's so easy to make it's a "natural."

This model features a mono-coque body with all balsa construction, good propeller endurance (on account of its large prop) adjustable rudder, and wings. On test flights it averaged 40 seconds hand-wound and 50 seconds winder-wound. The body is so strong that it will easily stand double power. In short, she can be flown as a speed demon.

THE FUSELAGE

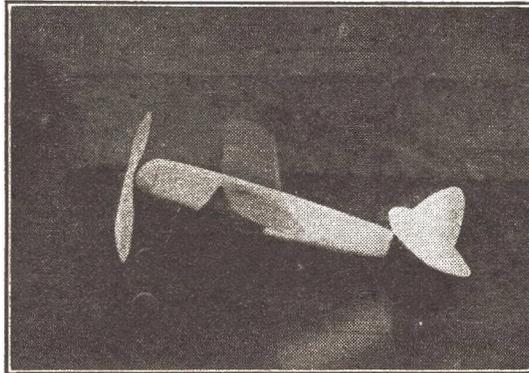
FIRST, cut out two pieces of each blank (4, 5, 6 on the plans). For this, one length of 1/16" by 2" by 36" sheet balsa will be sufficient. It has to be medium balsa—the type that bends very easily with the grain. Do not use quarter grained wood because it splits too easily. Cement each pair together (along the lower edge on plan) and let it dry.

Now cut four half-circle Formers, as shown on the plan (2 and 3). They are 1/8" in thickness. By this time you can take the middle blank, dampened with water (not too much and not where the seam is) and place a bulkhead at each end, in such a way that they stick out about 1/16". Pin them at several places. Now you can dampen the other two blanks the same way and place the two remaining bulkheads at the wider end of each and pin them. It will take about two hours to dry. Then cement middle blank with the bulkheads sticking out.

Now take the other two blanks, remove the bulkheads, and fit them onto the middle section. The top has to be fairly straight, and when it dries line it up by trimming it with a razor blade. Next take a piece of soft balsa 1/2" by 1/2" by 12 1/2", cement it flat on the top, and trim it to the peak shape.

The top narrows toward the back with the solid part sticking out over the body, which is filled in with the rear plug in order to make it a perfect streamline. The rear plug is a piece of fairly hard balsa. Shape the inner part first, push it into the body, and then trim the outside. Bend the rear hook and insert it. After this, cement a piece of 1/16" sheet (Former 1) over the entire nose, trim the outside, and cut the square opening into the middle, to receive the nose plug. This is made of a block 1 1/2" by 1 1/2" by 1" medium balsa. First, fit it into the opening, and then carve the outside to shape. The bearing is a large copper washer with an eyelet in it, cemented on the front and the rear of the plug. Make sure that the hole has the same downward slant as the plan shows.

Bend the landing gear out of .034 piano wire, hang two



She can zip through the air with the greatest of ease. And no wonder! Just look at that sleek body. "The Midget is so strong," says Mr. Garami, "that it will easily stand double power. In short, she can be flown as a speed demon."

eyelet in, just like on the noseplug. Bend the prop-shaft and insert it.

WINGS AND STABILIZER

CUT the 10 ribs out of 1/16" sheet balsa. Proceed with pinning down leading and trailing edges, which are 1/8" square, and 3/32" by 1/4", and cement ribs into their places. Now bend wings tips, which are 1/16" reed,

FULL SIZE PLANS—

for this top-notch flying model appear on the following two pages.

and cement the same. The single spar is 1/16" square hard balsa. Fit them into the notches and crack it downward outside the last rib to meet the wingtip.

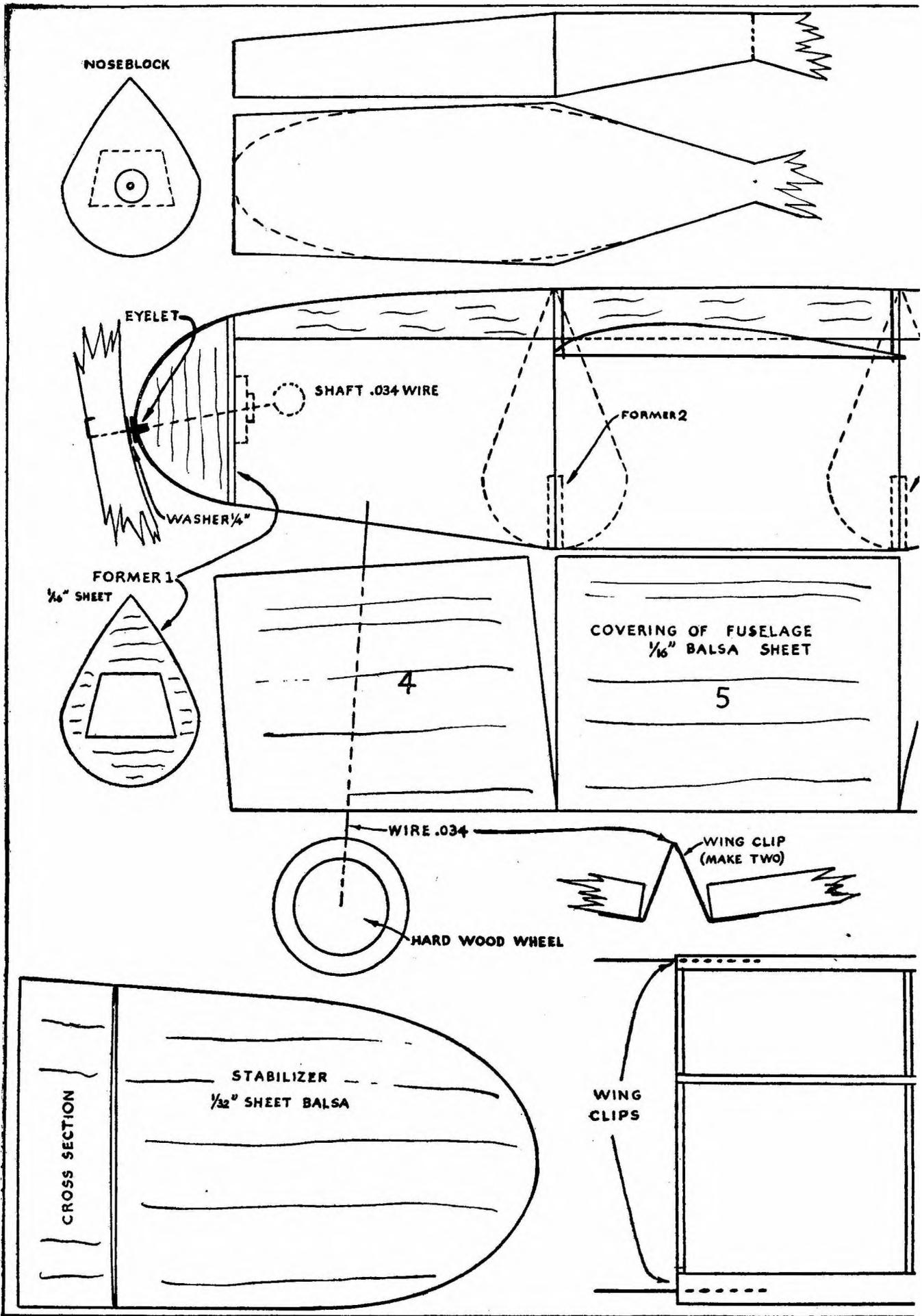
Since there are two separate wings, the covering is very simple. Cut four slices of Japanese tissue 3" wide, and using banana oil for adhesive, work from the middle toward the tips. After it is all covered, sprinkle it with water. Before it dries completely, hold it in your hand and look at it from the front to see if leading and trailing edges are lined up. If it is out of line, hold it in the proper position until it dries. The stabilizer and rudder are of 1/32" medium sheet balsa. The former is cut in two halves and is cemented onto both sides of the rudder. Watch the angle at which it is glued, because it must be the same as on the plan. The little movable part of the rudder is very thin sheet aluminum cemented on to the wood. Line up the whole tailgroup on top of the body with pins and glue it. Make the two wingclips alike and to fit the peak of the body, and tie them on with a rubber band at the middle section. Now take the two wings and cement them on in such a way that the clips come under the leading and trailing edges. The wing tips should be raised 1 1/2". The power for good endurance is four strands of 1/8" flat brown rubber.

FLYING

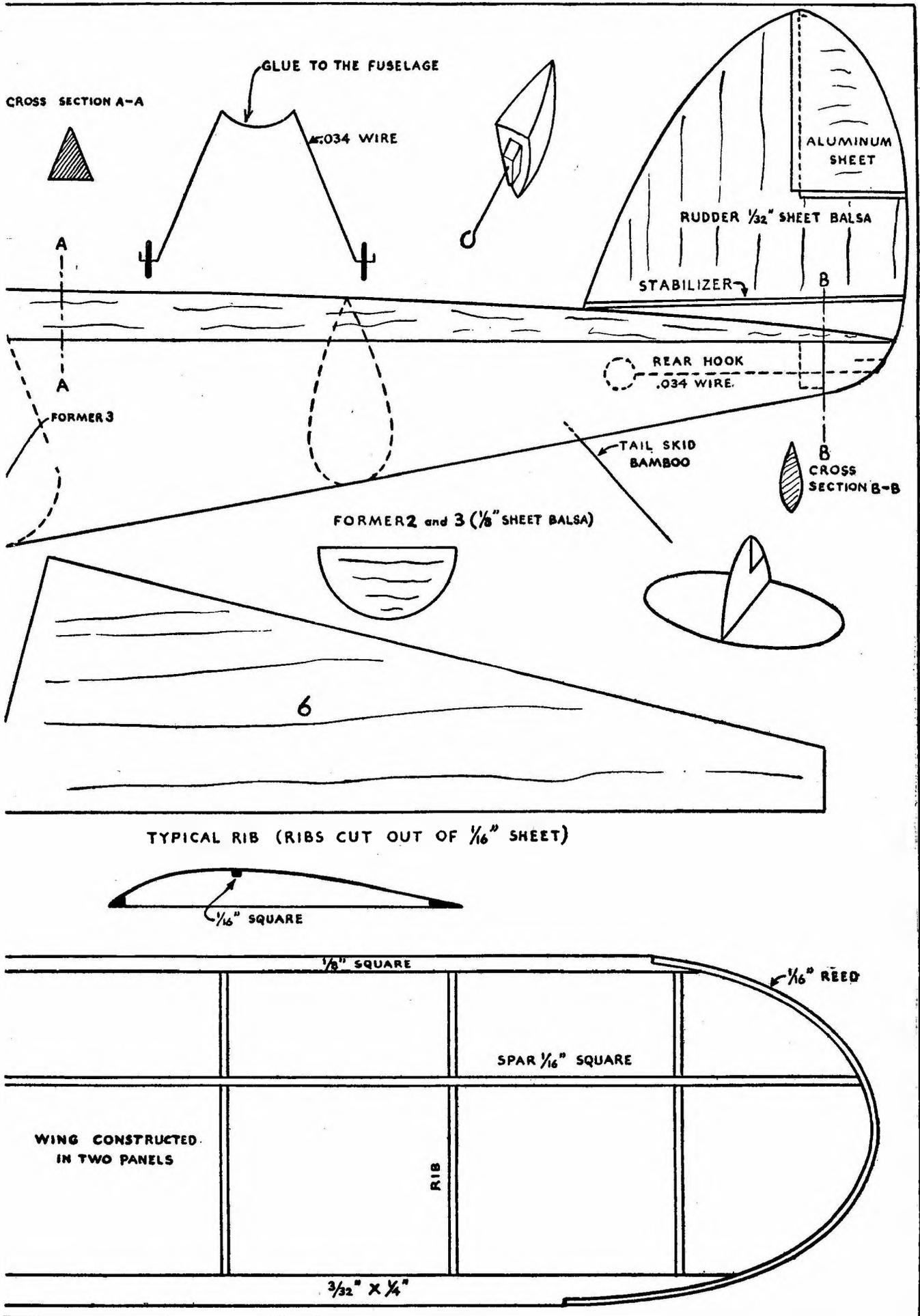
BEFORE you go out to the field, make sure that the propeller shaft tilts down as much as shown in the plan, and that the stabilizer angle is correct. Now glide

(Continued on page 95)

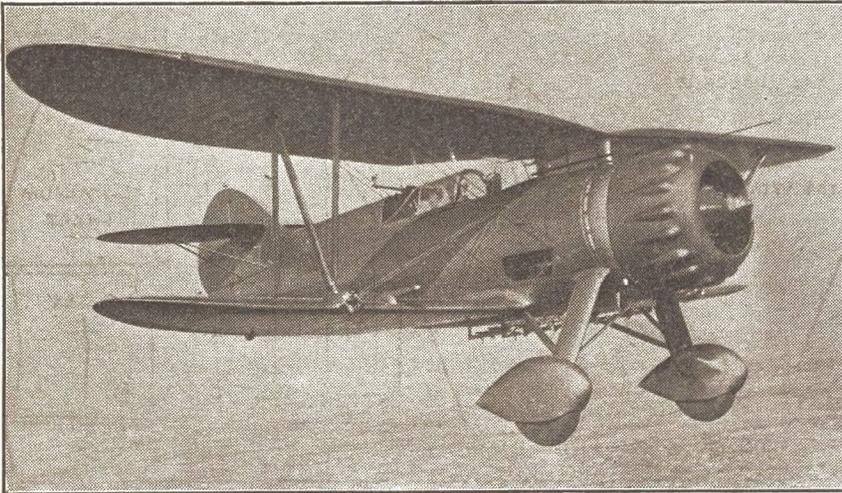
THE STREAMLINED MIDGET—Plan 1



THE STREAMLINED MIDGET—Plan 2



If this fine air photo of the new military Waco doesn't send a tingle up your spine, we don't know what will! She just breathes with speed, power and fight. Note the remotely-controlled 7 mm. Browning gun on the lower wing and the ample bomb racks under the fuselage.



You model fans who "go" for fighting planes couldn't wish for anything better than this special Waco job. As a solid model, it's a top-notch—the kind of ship that affords plenty of play for all you detail "fiends." And you non-builders, too, will want to dig into this article, for it offers a lot of interesting information on this first-class sky fighter.

Cuba's Waco Fighter-Bomber

By Jesse Davidson

ENCOURAGED by their success in converting several existing commercial designs into armed aircraft, Waco engineers and designers recently brought forth their first strictly military ship after two years of development. The new design was designated the Model D.

From the original model a series of ships have now been developed, which though basically alike in design and construction, differ in power, purpose, and armament. Today, they are available for market in six different types, as listed below:

- CHD 240 h.p. Wright R-760E (No armament)
- JHDA 380 h.p. Wright R-957E Armed.
- WHDA 420 h.p. Wright R-957E-2 Armed.
- SHDA 320 h.p. P. & W. Jr. T1B Armed.
- S3HDA 440 h.p. P. & W. Jr. TB Armed.
- S2HDA 400 h.p. P. & W. Jr. SB Armed.

These various models are designed to fulfill twelve different functions, as follows:

1. Standard Commercial job
2. Military primary trainer
3. Basic or advanced trainer
4. Two-seat fighter
5. Two-seat observation
6. Two-seat photographic
7. Two-seat long range photographic
8. Two-seat ground attack
9. Single-seat bomber
10. Single-seat mail plane
11. Ambulance (two stretchers placed aft of the pilots cockpit)
12. Seaplane

At this writing, the Model WHD is being used for military purposes by Cuba—the initial buyer. The three-view drawings on the next page shows the machine as supplied to the Cubans, completely armed and with full air service insignia.

The pilot and gunner are seated close together in a single cockpit which is covered with a sliding transparent coupe top. The seats are adjustable. Complete dual

control equipment is provided. Landing lights, parachute flares, and blind flying instruments are also standard equipment.

The pilot, who is seated in the front, is provided with two remotely controlled Browning machine guns of 7 mm. calibre, one mounted in each lower wing. A thousand rounds of ammunition is supplied for each gun.

The rear cockpit has a flexibly mounted Browning with five hundred rounds of ammo. Bomb sighting and releasing gear are also provided here, two bomb racks being mounted in tandem below the fuselage to carry either, ten 25 lb. bombs or two 125 lbs. "eggs."

Dimensions are: wing span 32' 8 $\frac{3}{8}$ "; length 25' 11 $\frac{1}{16}$ "; and height 8' 11 $\frac{1}{2}$ ". Two fuel tanks totalling 104 gallons capacity are situated under the fuselage floor, and another is placed in front of the cockpit. The ship is powered with a 420 h.p. Wright Whirlwind which drives a controllable pitch propeller.

HOW TO BUILD YOUR MODEL

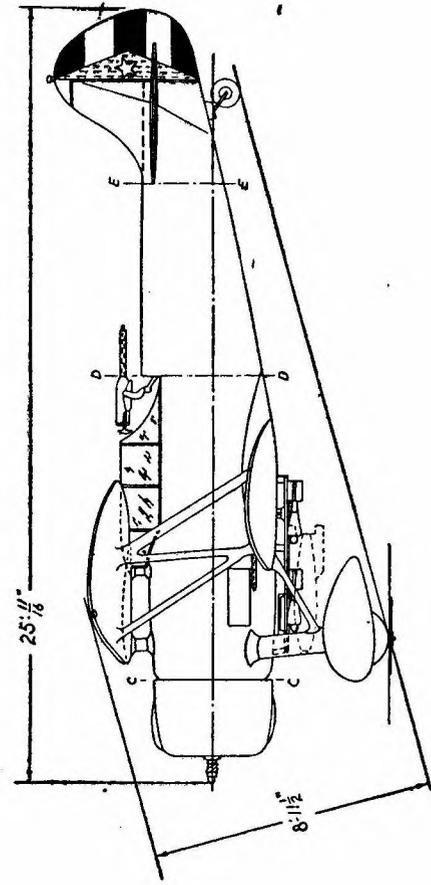
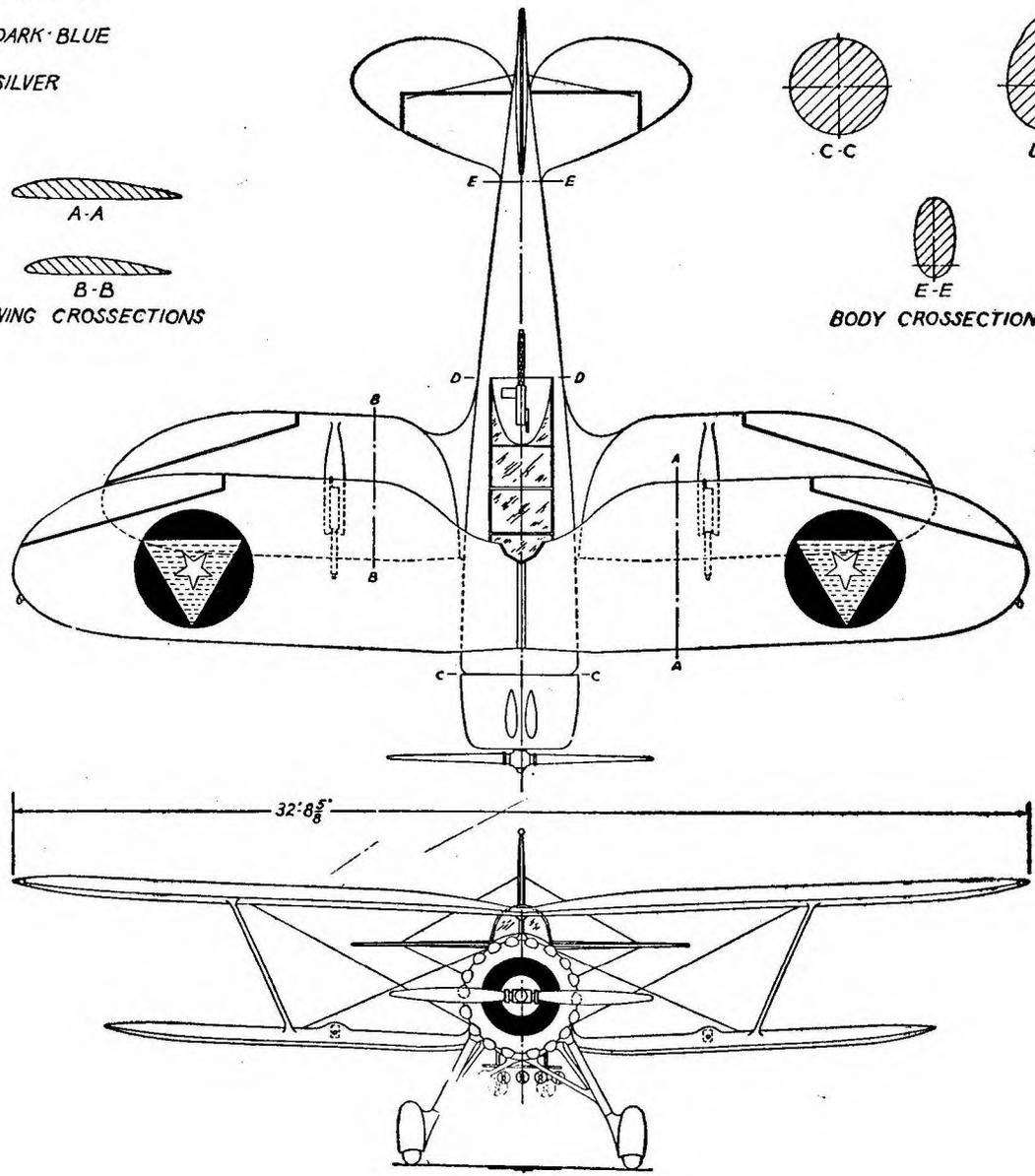
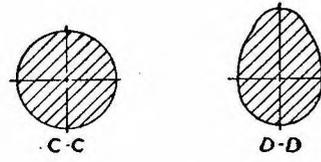
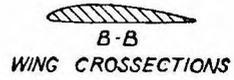
FIRST determine the size of the model you wish to construct. To do justice to the WHD, your model should be no smaller than twelve inches in span. It is
(Continued on page 94)



And here's a splendid side view of this great Waco. As you build your model, check from time to time with these photos; for they offer you a wealth of detail. (It will be observed that the plane above carries the Cuban insignia. The one shown at the top of the page had not yet been bedecked with its colors.)

KEY

-  - DARK RED
-  - DARK BLUE
-  - SILVER



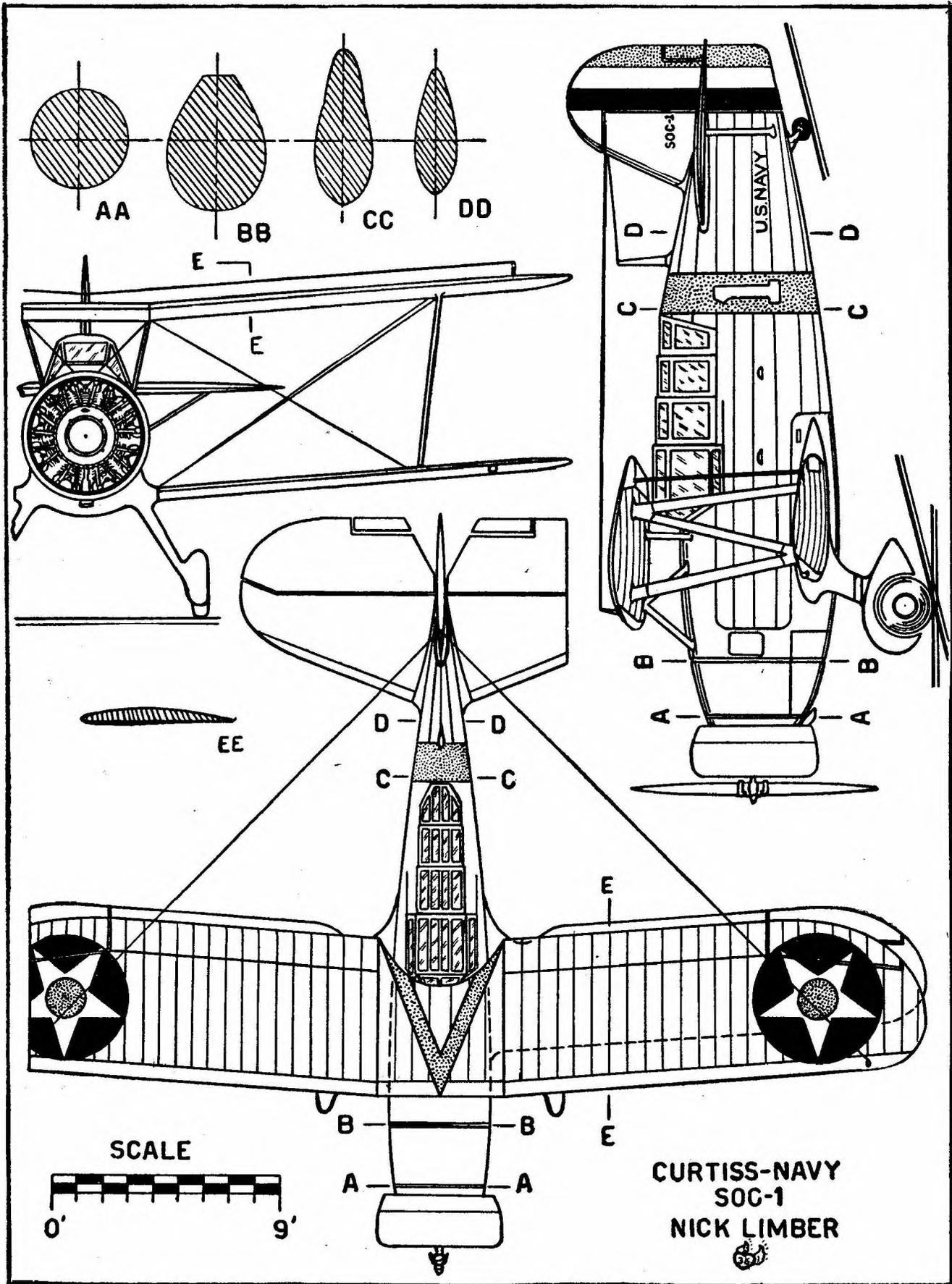
WACO WHD
CUBAN AIR SERVICE
FIGHTER - BOMBER
POWERED BY
WRIGHT 420 H.P. R-975E-2

JESSE DAVIDSON 4-'36

Plans For A Solid Model of the Curtiss SOC-1

HERE'S a superb ship for you fans to try your hand at. Originally dubbed the XO3C-1, this Wasp-powered scout-observation job became the SOC-1 when accepted by the Navy. Though performance figures have

been kept secret, she's said to do 250 m.p.h., and the fact that they've ordered 135 of 'em proves she's good. Floats may be substituted for the wheels for the wheels to make her a sea-plane. Note the "telescoping" cockpit covers.



Flying Aces Model Laboratory

Stability—and How to Incorporate It In Your Models

By Avrum Zier

Model Department Editor

ONE factor which is of utmost importance to all types of airplanes, whether large or small, is that of stability. Stability may be defined as the ability of any body which, after being displaced from a state of equilibrium, sets up forces about its center of gravity which tends to return it to its original attitude.

The common see-saw, or teeter-totter board, is a good example of stability. The board itself will maintain a level position provided the point of pivot is located on the center of gravity. However, should an external force, such as a push, be applied to either side, that side will tend to go up and down in a series of oscillations, each decreasing in magnitude until finally the board has returned to its original position.

In the sense of stability, the airplane may be compared to the see-saw for, like it, it must also maintain its equilibrium about its center of gravity and possess the qualities of restoring itself to its original attitude of flight if, perchance, it should be displaced by a sudden gust of wind or some other external force.

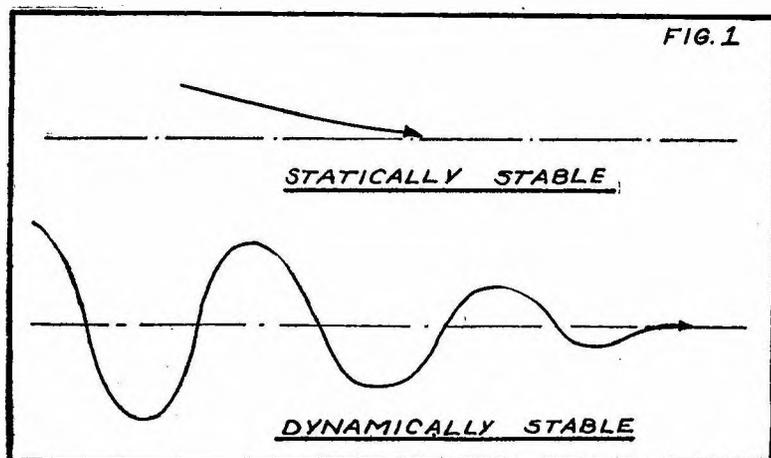
In an airplane, the designer incorporates only a certain degree of stability, depending upon the type of ship in question. No ship is ever designed to be perfectly stable, as such ship—known as a “stiff ship”—is extremely hard to maneuver. The pilot must literally fight the controls to overcome the restoring forces created by the airplane.

Racing ships as well as military pursuit jobs are designed with very little stability, while transport jobs maintain a very high degree of it in their design. If a large airplane is displaced and the degree of stability is not sufficient to restore the ship to its original position, the pilot depends upon the manipulation of the controls to do so.

In a model airplane the restoring qualities depend entirely upon the inherent stability of the model. For this reason, the stability factor of a model airplane must be greater than that possessed in a large plane.

In this article we are going to discuss stability as applied to a model airplane from a practical standpoint, and we will explain how it may be obtained.

Stability is classified into two major conditions, *static* and *dynamic*. An airplane is said to be statically stable if, after it is displaced from level flight, it tends to return to it in the path of the arrow shown in Figure 1.



To design a satisfactory flying model, it isn't sufficient that you builders watch your P's and Q's—you've also got to watch your C.G.'s! That's because a flying model must have stability if it's going to be any good at all. So dig into this article, which tells you how to apply these principles at your own model workbench.

If the ship in returning oscillates, as shown in the bottom of Figure 1, the ship is then said to be dynamically stable.

On the other hand if the ship, after being displaced, continues its flight without any tendency to return to its original position the ship is classed as being unstable.

EVERY ship must maintain its equilibrium about three axes. These axes are shown in Figure 2 with the proper name applied to the displacement from its axis. “X” represents the *longitudinal* axis, “Y” the *lateral* axis, and “Z” the *vertical* axis. To illustrate, select one of your models and follow through the following maneuvers—

Holding your model in front of you and looking at it from the side, the axis pointing toward you will be the lateral axis. By lowering or raising the nose of the ship you will be rotating the ship about the lateral axis. The name applied to such maneuver is known as *pitch*. A *positive* pitch occurs when the nose of the ship is raised, and a *negative* pitch when the nose is lowered. Both are with reference to level flight.

Now turn your model so that you are looking at it directly in front. The axis pointing toward you now is the longitudinal axis. Any maneuver in which the ship is rotated about the longitudinal axis represents a *roll*. Thus if the left wing is lowered, or the model rotated to the left, we have a *positive* roll, to the right a *negative* roll. (Still looking at the front of the model).

If you now observe the model from the top, the axis pointing toward you will be the vertical axis. The maneuver produced by rotating the ship about the vertical axis is called a *yaw*. A *positive* yaw is represented by swinging the nose of your model to the right, as shown in Figure 2, and a *negative* yaw is one to the left.

A leading factor of stability in any type of aircraft

is the location of the center of gravity (called the C. G.). Because of its importance it becomes necessary to determine its location on the model. The center of gravity of any object may be defined as the point on the body at which the entire weight may be considered as being concentrated. For example, take a pencil and lay it across your finger. Shift your finger along the pencil until a point is located where the pencil is balanced. That point is the C. G. of the pencil. In like manner if it were possible to place your finger directly on a Model's C.G., it, too would balance.

THE actual calculation of the center of gravity of an airplane requires that the weight of each part and also its C.G. be

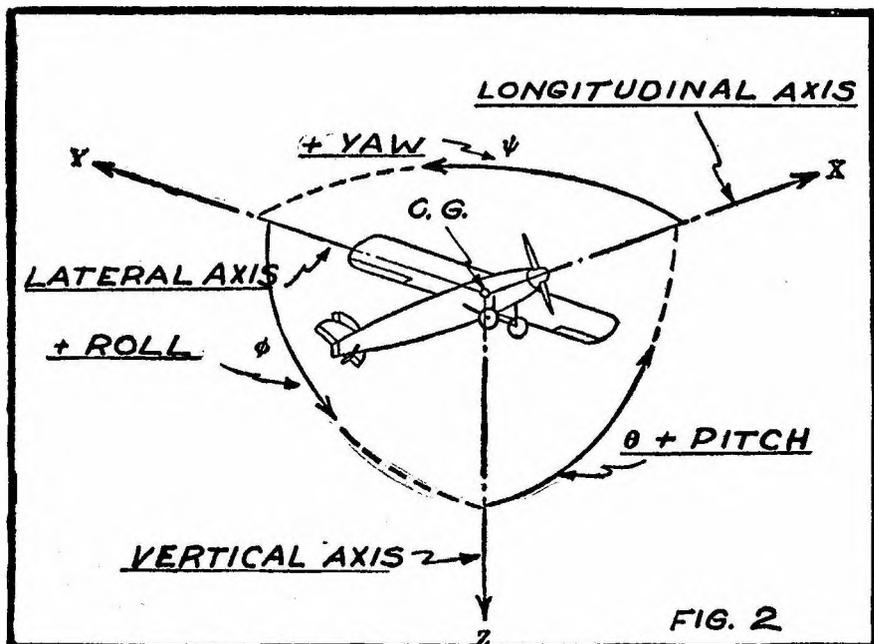
known. When we consider that a model airplane weighs within the range of a few ounces, the problem becomes somewhat tedious. Because of this, we must turn to another method in which the entire model is treated as a single unit.

Suspend from a convenient height a cord with a weight attached to its free end. The weight will bring the cord in line with the earth's gravitational pull. When the cord has finally come to rest, make sure that its normal position is not altered. The best method of preventing this is to check the weight with some marking on the floor.

Take the model in question and attach a hook to any convenient point, say a wing tip. Suspend the model from the cord by attaching the hook to the cord so that the model is free to swing. After the model has come to rest, mark the point on the model where the cord intersects the center line of the top of model (see Figure 3). This point indicates the location of the model's center of gravity. (On the average model it is most convenient to attach the hook to the wing; however, it does not make the least bit of difference where the hook is attached, since the intersection of the cord and the center line will always occur at the same point.)

The procedure just described locates the C. G. with respect to the longitudinal axis only. To locate the *exact* C. G. of a model, it becomes necessary to consider the vertical axis. To do this becomes a problem which must be attacked according to the model in question.

For example, let us assume that our model is a cabin job. On such type of model the following would be a good procedure: At the point of the longitudinal C. G. just found above, imagine a vertical line which represents the vertical axis. The C. G. will lie somewhere along this line, as shown at the lower right in Figure 3. Lay the model on its side and shift your finger along it until a point is reached where the model appears to balance. The method is the same as that explained previously in the balancing of the pencil. In shifting your finger you will find that it is almost impossible to locate your finger directly on the C. G. so that the model remains balanced; however, by constant shifting of



your finger and observing which way the model tilts you can approximate the position of the C. G. with sufficient accuracy.

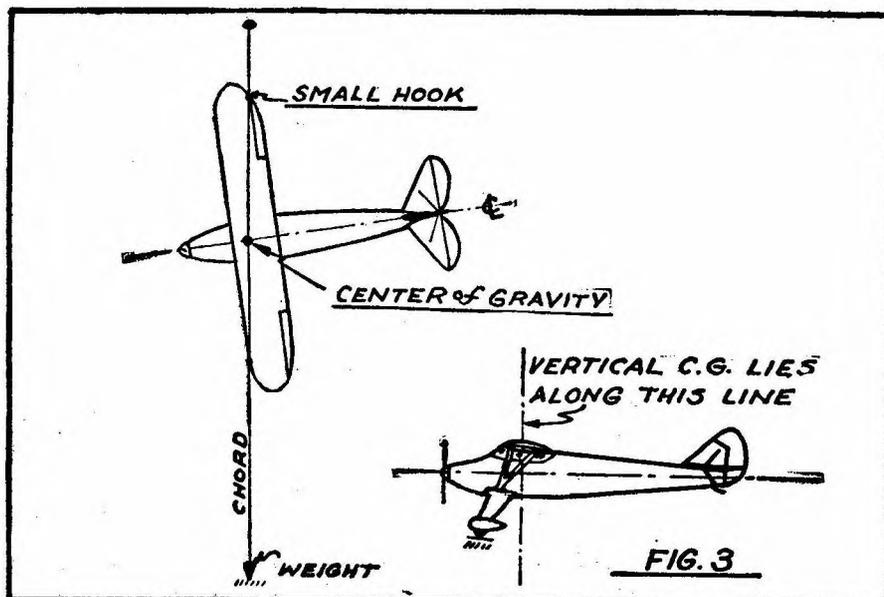
In the case of a cabin job the problem as just presented is rather simple; however, if the model in question is a stick model, then the problem becomes much harder. It is impossible to shift your finger, as there is no body—only a stick. In a stick model the chances are that the C. G. location lies between the wing and the stick itself. This, however, depends upon the distribution of the weight.

About the best method of finding the vertical C. G. on models of this type would be to suspend the ship on its side by two points and see which way the model tilts. By shifting the cord, the C. G. can be determined approximately.

Where the C. G. is located and where it should be located, is a factor which plays an important part in the stability characteristics of a model plane. The airplane, as was pointed out in many of our previous articles, is lifted by virtue of a difference of pressure between the upper and lower wing cambers. This pressure may be said to be concentrated at one point on the wing chord. The location of the center of pressure and its movement along the chord at different angles of attack, depends upon the airfoil section used. If we know the section we are using, then we refer to the characteristic chart.

For the sake of convenience we will assume any airfoil section. From the chart we find that the center of pressure is located 35% back of the chord at its maximum L/D ratio, which if you remember from our April column, is the lift divided by the drag. And the angle of attack corresponding to the L/D ratio is the angle of incidence at which the wing is most efficient. If, then, the lift of the entire ship is concentrated at a definite point along the wing the most ideal location of the C. G. would be directly under it.

THE reason for this can be best illustrated by testing a block of wood. The C. G. would naturally be located at the center. Suppose we



represent the center of pressure with a cord and attach it to the block of wood at any point other than at the C.G. By pulling on the string you will be exercising the same effect on the block of wood as the center of pressure does on the wing, giving a tendency to lift the ship. You will notice that when the cord is pulled the block of wood assumes an angular position. Now if you remove the cord and attach it to the C.G. and exert a pull the block will rise in a level position. In like respect, if the C.G. of the airplane is under the center of pressure the model will assume a level position, otherwise it would, just as in the first case of the block, assume an angular attitude.

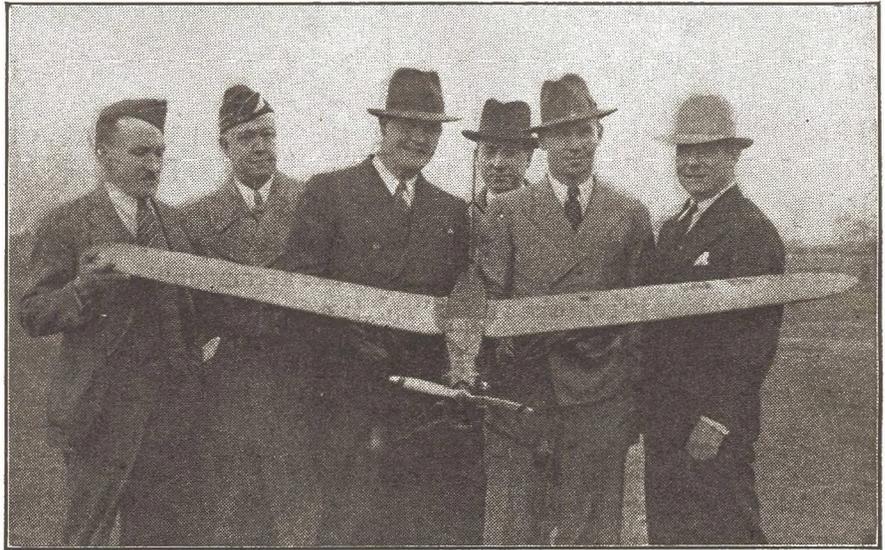
In the design of all planes there is usually a certain amount of down load on the horizontal tail. This down load is incorporated in the design for various reasons—reasons which will be discussed in our next article. Now if we refer back to the block where we have the string attached to the center of gravity, we can readily see that if we consider the block as representing the airplane and if we put a slight down load on the end of the block, it will again assume an angular position. To bring the block back to its original position it becomes necessary to change the location of the string. Its new position is now behind the C.G. In the same way, if we have a down load on the tail the proper place for the center of gravity would be ahead of the center of pressure. The distance ahead depends upon a few factors which we must neglect at present. Suffice it to say that the center of gravity on our model should be at a slight distance ahead of the center of pressure.

The question now arises—how far ahead of the center of pressure should the center of gravity lie. That depends upon the center of pressure location.

For almost all cases the model builder will be safe in assuming the C.G. location as being at 30% of the cord. However, if the center of pressure, as indicated by the characteristic chart, shows that its location is less than 30%, the C.G. location should be moved closer to the leading edge. In very few cases will this be necessary.

HAVING established the location of the center of gravity with respect to the center of pressure the problem now confronts us as to how we can manage to locate the C.G. at its proper place. In some cases, the builder is limited by the position of the wing, hence it becomes a problem of adding weights, or if possible subtracting. This is the case of a replica model, and the chances are that the C.G. will not come out at the proper place. For one thing the general distribution of the weights of a model as compared to that of a large plane is quite different. On replica types of models it is extremely essential to construct the tail from as light as possible balsa, with the least amount of structure work. In almost all cases the builder will find the model tail heavy. About the best way to bring the C.G. to where it belongs would be to attach it to the cord

Swell Model! Great Flyers!



AMERICA'S aero top-notchers get just as big a kick out of a well-built gas job as you do. This photo, clicked at the exact spot in Grant Park where the first mail plane landed in Chicago, proves it. Left to right: P. J. Sweeney, President of the Central Gas Modelplane Society and builder of the Puss Moth shown; G. Carmichael, Commander of Aviation Post 651 American Legion; Jimmie Matern, famed distance flyer; E. F. McGinnes, Air Service machine gunner; Major Phil Love, Director of Aviation, Missouri National Guard and Lindbergh's partner in first Contract Air Mail flights; and the one and only Jimmie Doolittle, renowned speed ace.

as in Figure 3 and determine its center of gravity. If the model appears tail heavy, add small weights to the nose or use a heavier propeller. Add the weights until the cord passes through the proper C.G. location as determined by 30% of the chord. You need not worry about the location of the vertical C.G.

If we now consider a stick model or cabin job in which the wings are movable, the problem becomes a little simpler in that the wing is shifted accordingly, so that the C.G. falls at its proper place under the wing. On such type jobs, never add weights—always shift the wings.

Remember, weight is the deadly

enemy of every model plane. However, it sometimes becomes necessary to add weights, as with replica models.

We must emphasize the importance of logical construction of a model plane, for experience is the best teacher. But in building your next replica model, remember the faults of the previous model you built—and make sure you correct them.

My space is used up now, so I'll have to be coming in for a landing unless I want to over-shoot the page. Next month we will continue our discussion of stability by considering stability about each of the three axes and how to incorporate it in your models.

All Questions Answered

(Continued from page 25)

strange hum. The Spad was not an American plane. It was French. And as for the Fokker, which model are you referring to? The D-7 was generally considered their best single-seater.

Sarah Jane Stranyer, Johnstown, Pa.:—A young lady by the name of Martha Wise, of Pleasant Gap, Pa., wishes to get in touch with you. We've done our part. Now you do yours.

Dick Dager, Canton, Ohio:—On the Flying Flea, banking is accomplished by "warping" the wings, thus no ailerons are required. This warping is done via the controls, and I understand that once the rudder is put over, the machine automatically banks itself.

H. W. McNeal, Houston, Texas:—I advise you to get the book, *Heroes of Aviation* by Laurence La Tourette

Driggs which has the best record of squadron victories of any book I know. Few volumes can claim to be absolutely correct, but this is one of the best. It is published by Little, Brown & Company of Boston. This address will reach them. I have no record of the number of actual hits scored by anti-aircraft during the war. I saw one while flying over St. Jean, but such hits were, you might say, accidental.

Dinny Waterman, Davenport:—The difference between the Boeing and the Douglas transports may be noted, when you observe them in the air, by comparing the leading edges of the wings. On the Douglas the leading edge sweeps back and on the Boeing the leading edge runs nearly at right angles to the line of flight. Tony Fokker is now in Holland where his airplane plant is located.

—BY ARCH WHITEHOUSE.

Results of National Model Meet

Here they are, fans—the high lights of the National Model Airplane Meet just held at Detroit, together with names of winners in the various events and the flying times that did the trick. Our Model Department “Field Marshal,” Phil Zecchitella, was right on the spot for this big show. He dispatched the accompanying news and photos from the model “battle ground” just in time to make this issue.

By Philip Zecchitella
Special from Detroit

THE 1936 National Model Airplane Meet closed at Detroit, Thursday, July 2, after a swift cycle of breath-taking events mingled with an international flavor. Competing for the Wakefield Trophy were teams from England, Canada, France, Australia, and our own United States. Competition for the coveted award, which was brought to the United States last year by Gordon Light, was a neck-to-neck struggle. England's victorious average of 4 min. 9 sec. was but seven seconds better than that of Ray Wriston, of Tulsa, Okla., whose average flight was 4 min. 2 sec.

The Wakefield trophy was not the only one to leave this country. An entry built by Vernon Gray of Australia was flown by Bertrand Pond in the Moffet International Event for a record flight of 44 min. and 14 sec. The trophy will now leave for Australia where American contestants will have to stretch 11,000 miles to bring it back home. Ouch!

A new record was established in the Open Class Gas Event by Mike Kostich, of Akron, Ohio, with a flight of 36 min. and 30 sec.

The contest was the largest and most successful of all



Eye-droppers are standard equipment with all gas jobbers. Above we see Ira Hassad, of California, feeding his tiny 1/2-inch bore engine with one. Ira designed and built this unusually small plant. The model in which it is mounted carries 300 square inches of wing surface.

National meets thus far held. There were over 400 entries and more than three thousand spectators at the outdoor events held at the spacious Wayne County Airport. Autos were provided to chase the gas models—which inevitably flew for miles and miles. Engine trouble was not in evidence this year, the boys seeming to have little or no trouble in starting their baby power plants.

A remarkable innovation was the appearance of tiny gas engines much smaller than the average gas model engine. But these diminutive plants proved difficult to start due to their small size.

The indoor meet was held in the massive Olympia Auditorium, site of the early national meets. Noticeable this year was the drop in the number of microfilm props. An ingenious lad, however, appeared with a microfilm prop featuring adjustable pitch while in flight. This adjustable pitch prop is something new. It is actuated by pressure induced by the wound rubber upon a spring which is compressed at the take off. As soon as the rubber has lost part of its strength the spring is released and the blades open to a higher pitch.

Very strange to all was the fact that the British team was allowed to compete in the outdoor Stout fuselage event which we thought was strictly a domestic trophy and not open for international competition. Luckily, the British team only placed second. Had they won, the Stout Trophy would have gone to England—and I assure you not without appropriate furor. With two trophies now in British territory, the Stout would have been, let us say, the last straw. It is doubtful whether there would have been any events left for the 1937 Nationals.

(Next year's meet, incidentally, will feature \$1,000 in cash prizes, and for the winner of a radio controlled gas model event there has been posted a 200 dollar cash prize to be awarded by the A.C. Spark Plug Company.)

(Continued on next page)



A general view of contestants in action on one of the Wayne County Airport runways. The boy at the right has just launched his craft into the air. Note the large kits in which the competitors carry their ships and emergency accessories.

STOUT CONTEST WINNERS

THE Nationals were sponsored by the *Detroit Evening Times*, with Mr. Whalesby, aviation editor of the *Times*, acting as contest director. The following is a résumé of the results:

The winner of the Stout Indoor Stick Model Event for those under 21, was John Haw, 20, American-born Chinese of Philadelphia, with a flight of 18 min. 10 sec. In addition to the Stout Trophy, Haw also received a special *Detroit Times* Trophy and a 1,000 mile airplane trip offered by Central Airlines. Bruno Marchi, 19, of Massachusetts, won second place, winning the Comet Trophy. His time was 18:01. Third place went to Wilber Tyler, 19, of Boston. His time was 17.52 winning for him the Central Airlines Trophy.

In the Indoor Stick Event for those over 21, the winners were as follows: First place went to Carl Goldberg, 23, of Chicago, whose model flew 19 min. 56 sec. He received the Springfield Trophy. Second place was won by Roy Wriston, 22, Tulsa, Okla., with 17:56. His award was the *Detroit Times* Trophy. Third place was taken by Joseph P. Matulas, 22, of Chicago, with 17:55.

In the Indoor Fuselage Model Event for contestants under 21, first place went to Alvie Dague, 16, of Tulsa, Okla., whose flight of 16 min. 17 sec. brought him the Bloomingdale and *Detroit Times* Trophies. Second place was won by John Haw, 20, of Philadelphia, his time being 14:54. He received the Paul Guillow Cup. Third place in this event went to Albert W. Coutiel, 19, of St. Louis. His time was 14:31.8. His award was the *Detroit Times* Trophy.

The winners for this same event in the over-21 class were as follows: First prize, The Country Club Trophy, went to Joseph W. Matulas, 22, of Chicago. His time was 11 min. 21 5/10 sec. Second award, the American Airlines Trophy, won by Jessie Bieberman, 31, of

COMING MODEL CONTESTS

St. Louis, Mo.—Mississippi Valley Model Airplane Tournament, August 21-22. Open to all in this section. Prizes. Entry blanks and information may be had from sponsor: Stix, Baer & Fuller Model Airplane Club, St. Louis, Mo.

Indianapolis, Ind.—American Legion Fourth Annual National Model Airplane Contest, August 29-30. Various indoor and outdoor events. Entry blanks and list of rules may be had from Director, Aeronautics Commission, 777 N. Meridian St., Indianapolis, Ind.

Toronto, Ont., Can.—Canadian National Model Contest, August 31-September 2. Indoor, outdoor, and gas job events. U. S. contestants may enter. For information, write Contest Director, Canadian National Exhibition, 705 Lumsden Building, Toronto, Ont., Can.

Philadelphia. His time was 10:25. Third place was taken by Teen Becksted, 22, Chicago, with 9:37.5.

The Rear Admiral Moffett International Trophy (awarded in a special outdoor cabin event) was taken by Vernon Gray, of Auckland, New Zealand. Gray shipped his model here, and it was flown by Bertram Pond, of Peru, Ind. The model flew for 44 min. 14 sec. before it was lost from sight by the pursuing cars. Other winners in the Moffett event were awarded trophies and medals. Second place went to Robert Jeffrey, Findlay, Ohio, with a flight of 10:58. Third place went to A. Worley, of England, whose model was also flown by proxy, the time being 9:45.

SCALE MODEL RESULTS

MODELS entered in the Exhibition Scale Model Event were on display during the week. The models were judged on the basis of neatness and accuracy. First place went to Lou Casale, of Syracuse, N. Y. His model was given the highest rating—98% perfect. Second prize was won by Bronik Soroco, with a rating of 97.9%; and third place was taken by H. Walker with a 96% perfect job.

With a three-flight average of 4 min.

9 sec., Albert A. Judge, representing the Model Airplane Club of London, successfully outflew contestants from all over the world to win first place in the Outdoor Cabin Event which carried the Wakefield Trophy. Ray Wriston, 22, placed second with an average of 4:02. After losing his original plane on Tuesday, Ray worked all night to complete a new ship to fly the next day. Third place was won by Robert Copland, 18, of London, Eng., with an average of 3:23.

GAS MODEL EVENTS

RESULTS in the Texaco Gas Model Contest were as follows: Francis J. Tlush, 19, of Lyndhurst, N. J., flew his fuel-powered model for 45 min. 34 sec. to win first place. Second place was won by W. Hewitt Phillips, 13, of Belmont, Mass. His time was clocked as 30:12. Third place was taken by Joseph H. Buehrle, 17, of North Little Rock, Ark., with a time of 27:33.

Winners in the gasoline model event for those over 21 years of age were as follows: Mike Kostich, 21, of Akron, Ohio, won first place with a flight of 36 min. 52 sec. This established a new world's record for this class. Second place went to Melvin H. Yates, 30, of Joliet, Ill. His time was 27:32.

LINED UP ON THE RUNWAY
for the

NEXT SMASHING NUMBER OF FLYING ACES



FICTION—Smashing “Buzz Benson” yarn again featuring the popular Lonny Cressford. “Steve Wells” returns to FLYING ACES in a bang-up China Coast sky novelet. “Phineas” goes to Russia—a rip-snorter that’s good for 1,000 laughs!

FACT—Aircraft Carriers Beneath the Sea—a surprising article by Lieut. Lewis. The Inside Story of Aircraft Guns, another ace feature by David Martin. And special—A Girl Conquers Gravity!

MODEL BUILDING—How to make a flying model of the famous “Sky Flea.” Plans for a solid model of the unique AG-4 Crusader. A slew of other plans! And another great gas job article!

IN OCTOBER FLYING ACES
●
ON SALE AUGUST 25th

Hellions of the Headless Death

(Continued from page 6)

"You fools! You'll die if you—"

His words ended as though an unseen hand had choked him. With a horrified expression his eyes twitched back to Strange.

"North—bridge of boats!" he gasped. "Von Munster has—"

His right hand flew up in a frantic gesture to the nearest men. Tottering backward, he clawed at his throat. Strange gave an exclamation, and a burly non-com who had been about to seize Conway jerked to a stop. For a weird bluish glow had appeared on the pilot's face. It was as though a beam shone through the mists upon him—but no such beam was visible.

A terrible premonition swept over Strange. For now that eery light was spreading in an aura about the G-2 pilot's head.

"Conway!" he cried.

There was a short, blinding flash, an explosion that hurled a nearby sergeant backward. Then a dark blue smoke eddied about the spot where Conway's body had fallen. Strange took a step forward, looked down in horror.

The Headless Death had struck again!

CHAPTER III

THE PEASANT PRETEXT

AT the sound of the explosion, Jordan had spun around. Several of the crowd milled past him, then jumped back at sight of the gruesome figure on the ground.

"My Lord!" a young pilot cried. "It's started here, too!"

"Keep still," muttered Strange. "You'll start a riot."

The young pilot, after another look at the dead man, shuddered and turned away. Colonel Jordan, with a visible effort, pulled his gaze from Conway's body.

"I heard him warn you about something," he said thickly. "What was it?"

Before Strange could answer, a beefy lieutenant-colonel pushed his way through the crowd. Strange recognized the Wing commander and hurriedly stepped to his side.

"You'd better evacuate the field," he said in an undertone. "This poor chap was a G-2 agent, and he died trying to warn us that we were in danger."

The Wing commander's red face paled. He turned and croaked an order at the nearest officers. For a moment Strange thought the frightened soldiers were going to break in panic. Then discipline asserted itself. Pilots and mechanics ran toward the ships, and the rest of the men scrambled into a ragged formation for marching off the drome.

Strange bent over the form of the unconscious sergeant who had approached too near to Conway. The man's face and neck were burned a queer bluish black.

"Is he dead?" Jordan asked in a husky voice.

"No," said Strange, "but he's undoubtedly blinded, and those burns may prove fatal."

Some one had summoned the field ambulance. The unfortunate non-com was quickly placed inside, and the machine sped away. Jordan swung around to the other car.

"Come on!" he said to Strange. "What are you waiting for?"

Strange had turned again toward Conway's body.

"Just a second," he said.

He knelt, looked at the terrible, scorched spot on the dead man's shoulders. Conway's head had literally been blown from his body. His gray German uniform had been burned away, and his shoulders and chest were a hideous blue-black, just as the non-com's face had been. The rest of his uniform and even his gloves, had been scorched and were the same queer color.

"Come on!" Jordan rasped again. "If you don't value your life, I value mine."

"Just one more moment," Strange said swiftly. He ran toward the Fokker. He was within ten feet of it when a faint explosion sounded above the roar of hastily started engines. Over near the front of the hurrying column he saw a puff of blue smoke arise. On the ground lay three headless bodies. The marching men wildly broke ranks and fled in the other direction. The driver of Jordan's car took one look. With a frenzied jerk at the gear-lever, he sent the machine careening across the field.

"Come back here, you yellow rat!" Jordan howled after him.

"No use, colonel," Strange said tautly. "Make for the D.H.!"

He could see that the pilot of the two-seater was already in the front cockpit, and that the prop was whirling.

"What about you?" Jordan shouted as they ran toward the line. "Your ship was out of gas when you landed."

"I still have legs!" Strange said grimly.

FROM the farther end of the tarmac there came another flash of blue flame. It was followed in quick succession by several others, and Strange saw a number of mutilated figures writhing on the ground. Like cattle, the rest of the terrified men stampeded in all directions. The mechanic at the D.H. chocks dropped the pull-ropes and ran. With an oath, the pilot leaped to the ground, jerked one chock.

Two hundred feet away, a Nieuport roared out from the line. A second later, there was a flash and an explosion back at the spot he had left. His mechanic was quickly enveloped in a cloud of blue smoke. Jordan's pilot dropped the second chock-rope, dashed frenziedly down the line. Strange and the G-2 chief were nearly to the two-seater when Jordan stumbled and fell.

"Go ahead, Strange!" he groaned. "I've twisted my ankle!"

Strange whirled, dragged Jordan to his feet and helped him to the D.H. A

vigorous boost, and the G-2 chief was tumbling into the rear pit. Strange vaulted to the wing, jumped into the front seat. He had the stick back and throttle open in a fraction of a second. The Liberty roared, and the two-seater swung around, pivoting on the chocked wheel. With a furious kick at the rudder, he threw the ship free, and the D.H. thundered down the field.

A swift-taxiing Spad plunged in at an angle. The pilot was staring back in stark fear. Strange braced himself, hauled at the stick for a zooming take-off. The D.H. roared up over the smaller plane, then swayed back to the ground. The Spad pilot flung around with a start as the two-seater passed above him. His ship ground-looped, and with a muffled crash struck another Spad head-on. Both planes burst into flames.

Strange looked away, sick at heart. The D.H. was again in the air, was now climbing steadily. He gazed back at the ground. At least a dozen bodies lay in the road along which the column had been marching. Most of the men were fleeing across the field to the South. Only a third of the planes had taken off. The mysterious death had struck too quickly for the other ships to be started.

He turned as Jordan thumped at his back. The G-2 chief was pointing across the misty sky. Strange felt his flesh creep. A Nieuport pilot was standing up in his cockpit, clawing at his throat. And shimmering on his face was the queer and deadly blue light!

The nose of the Nieuport suddenly glowed with the same eery color. Strange had a last glimpse of the pilot, whose clawing hand now shone just like his face. Then a dazzling flash at the nose of the ship hid everything else from his sight. The roar of the Nieuport explosion came dully through the Liberty's thunder. He saw the shattered remnant of the ship go twisting down, the figure in the pit mercifully hidden. Blue smoke trailed it, and the blaze which began to sweep the wreckage had the same curious hue.

Strange pulled up steeply, gazed about him. But there was no sign of anything to explain that fateful light. When he glanced down again, he saw that the mess-hall was on fire. Around the building and the two burning Spads was a huge cloud of luminous blue smoke. As he watched, the cloud slowly began to drift across the field to the West.

He banked, circled southward and pointed the ship toward the Front. Colonel Jordan again thumped at his back, and he throttled the Liberty.

"Where are you going?" the G-2 chief bellowed.

"Germany," shouted Strange. He shoved the throttle open, ignoring Jordan's angry pounding on the rear cowl. At top speed, the D.H. raced through the murk. As they neared the lines, Strange nosed down, wiped his misty goggles. The two-seater hurtled above the trenches at less than a hundred feet. Startled Germans gazed up, but the ship

had left them behind before they could raise their guns.

Abruptly, Strange turned, peered down the tilted wing. He could see straight into a communication trench leading to the rear of the Boche lines. There was a steady file of stretcher-bearers plodding along in the mud. And on almost every stretcher was a headless German soldier!

Headless—and, in half the cases devoid of one or both hands! Strange banked away with a sudden feeling of triumph. He was right—it had been an accident!

THE arrival of the D.H. had caught the German soldiers off guard, but now they had waked up. A fierce barrage from a hundred Mausers sprang up as the plane turned back. Strange zoomed, twisting away to the right. A Maxim stuttered angrily below them, and black dots ran across the left wing. Jordan sprang up to the twin Lewises. The two guns hammered a savage reply as Strange whirled the ship back toward France.

It was quickly over, and again they were boring through gray mist, with the ground hardly visible below. Strange held the Liberty almost at full speed, in spite of the climbing hand of the temperature gauge. His face was hard, but his eyes held an eager gleam as he set the course for Grancy. When they reached the little French town, he swung off toward the meadow where the Red Cross tents stood. There was space for landing on the other side of the clearing.

Two Nieuports from Fifth Wing had already landed there, he saw as he glided down. The D.H. rumbled across the uneven turf, stopped near the two planes. He threw the switch and the overheated Liberty died with a wheezing cough.

"How the devil did you know about those Germans?" Jordan barked.

"It was only a guess," said Strange.

"If you've figured this out," insisted Jordan, "I want to know the answer!"

"I've guessed only one point," Strange said. "Whatever this thing is, the Germans made a mistake last night. I don't think they intended to strafe the area in that death-lane."

"What about Fifth Wing?" demanded the G-2 chief. "You think that was an accident, too?"

Strange's lean face tightened.

"No, I believe that was deliberate. But let's get to Corps. I'm anxious to see that old Frenchman whom they found alive."

Jordan looked toward the Red Cross tents and the rows of blanket-covered figures lying on the ground. At his questioning glance, Strange shook his head.

"No need to look at them now. Poor Conway took care of that."

They skirted the edge of the meadow. After a minute Jordan was able to commandeer an ambulance, and they climbed into the back.

"Did Conway give you any clue that will help?" he asked, as they bounced over the rutted road to Grancy.

"He tried to," Strange muttered. "He said 'North—bridge of boats. Von Mun-

ster has—' and that's as far as he got. I've been trying to think what he could have meant."

The Colonel gloomily rubbed his jaw. "There are probably two or three hundred pontoon bridges near the Front. That won't help much."

Strange stared down at the floor of the swaying ambulance.

"Poor devil! He knew he was going to die just that way—and he tried to cheat death long enough to tell us the secret."

Jordan did not speak for a minute. When he did, his voice had lost its customary gruffness.

"He was in Boche uniform, wasn't he?"

Strange nodded dully.

"Yes, he must have been working close to the source of this hellish business. He probably waited to be sure he had enough information to wreck the scheme—or else he couldn't break away until today."

"Maybe Brooks will get through with something," said Jordan, without much hope in his tone.

"I doubt it," returned Strange. "Conway was twice as clever, and if he couldn't fool them I'm afraid Brooks wouldn't have a chance."

They were silent until the ambulance reached the little town. When they arrived at Corps Headquarters, they found a scene of confusion. Wild-eyed officers were dashing back and forth, and breathless messengers scurried from one room to another. They went to the Intelligence section. In the ante-room, a perspiring lieutenant was trying to



carry on three telephone conversations simultaneously. He jumped up as he saw Strange and Jordan.

"Things are in an awful mess, sir," he said to the colonel. "It's happened again, at Fifth Wing!"

"I know," Jordan said harshly. "Where's Major Todd?"

"He's trying to find the French pilot who saw the death-ray, sir," stammered the junior man.

Jordan wheeled to Strange.

"What'd I tell you? I knew it was a death-ray!"

Strange looked at the clock. "When did he see it?" he asked the lieutenant.

"Just before all this happened at Fifth Wing. That's what we heard, but the major's gone to—"

"You said that before," snapped Jor-

dan. "Get Todd here—and the French pilot, too. We'll be in the next office."

A THIN, sad-faced major hurried into the inner room a minute later. With him was a taller man in the uniform of the French Flying Corps. His slate-blue eyes had a somewhat dazed look.

"This the man who saw the death-ray?" Jordan demanded bluntly.

"Yes, this is *Capitaine* Moreau," said Major Todd. He had a mournful voice. "He doesn't understand English. If you want me to—"

Jordan brushed him aside, faced Moreau and spoke in slow, careful French.

"Captain, I want to know exactly what you saw. Talk slowly, as my French isn't very good."

Moreau saluted punctiliously.

"I was bringing some dispatches from French Fourth Army H.Q., *mon colonel*, when I saw what I thought was a queer rainbow in the mist. The only color in it was blue, and it was all so faint I could hardly see that. But it curved like a rainbow. Then it became brighter, and suddenly I felt giddy. The next thing I remember is that my plane was in a tailspin. I brought it out, flew here and landed."

Jordan swore in disgust.

"A hell of a lot of good that does us! Why didn't you notice where you were, and check the direction it came from?"

"*Oui*, but I did! I was about nine Kilometers south of Grancy. And the ray came from almost due East."

Jordan lost his sour expression.

"Now we're getting somewhere!" He looked at Strange. "That gives us a better idea where to search."

There was a rap at the door, and the lieutenant poked his head inside.

"Begging the colonel's pardon, but there's a rush wireless from British Naval Intelligence for you, sir. It's already decoded."

Jordan took the message. Strange stopped the younger officer as he was about to withdraw.

"Would you mind attending to this, lieutenant?"

He held out a scribbled memorandum. The lieutenant took it and disappeared. Jordan eyed Strange.

"What's that for?"

"A few items for the trip you indicated a while ago," Strange replied. "But I'd like to see that old French peasant and hear his story before I go."

"I've got him waiting outside," interposed Major Todd. He went to the hall door.

"Look at this!" Jordan said. He handed the wireless message to Strange. "What you saw in the Channel was only part of it."

Strange scanned the words:

S. S. Brighton found, as described in your code. Two American destroyers, and U. S. Naval Air Station near Margate similarly stricken. None alive on the three vessels. Please rush all possible information.

Strange laid down the message. Jordan savagely rubbed his jaw.

"That makes it worse than before.

Margate is about thirty miles beyond where you saw the *Brighton*."

MAJOR DODD had entered, and with him had come the peasant. The old Frenchman was unkempt and very dirty, and obviously quite frightened.

"Here he is," the major said resignedly. "His name is Jacques. You'll have to talk loud, as he's deaf."

Strange smiled at the old peasant. Jacques eyed him suspiciously as he began his queries. When Strange finished, he spoke in a thin, cracked voice, looking around at everyone.

"*Messieurs*, I am always in my bed by the hour of nine, and asleep soon after. Last night it was no different. I awoke this morning and went out to feed my pigs. But alas, *messieurs*—" his wrinkled old face fell—"the pigs are dead. Then the *soldats* come—they tell me my neighbors are dead—they seem to think poor old Jacques is to blame—"

"Wait," interrupted Strange. "You heard nothing unusual in the night?"

"Nothing at all, *m'sieu*. But I am deaf. And I work hard, so I sleep hard, *m'sieu*."

He spread his dirty hands in a shrug. "We're wasting time," Jordan snapped in English. "There's nothing to be learned from this old tramp."

"On the contrary," Strange said in a sharp voice, "I think he holds the secret."

Jordan started. "But how could a dirty old—"

He jerked around. The lieutenant had entered, carrying a coil of rope and two towels over his arm, and a roll of tape and a pair of handcuffs in his hand. Alarm came into Jacques' wrinkled face as he saw the manacles. Strange had already laid aside his flying-coat, with his helmet and goggles. Calmly, deliberately, he removed his Sam Browne belt and his blouse. The old peasant's eyes popped wider than ever as he saw the gun in Strange's armpit holster.

"*Mon Dieu!*" he whimpered. "What are you going to do to me, *m'sieu*? I have told you the truth—"

Strange motioned for Major Todd to block the hall door. The lieutenant was already at the door to the ante-room. Jacques backed away, his lips trembling, as Strange picked up the manacles. The lieutenant started toward him. With a moan, the old peasant darted past him.

"Seize him, Moreau!" Strange rapped at the *capitaine*. "That's it—hold him till I snap these bracelets."

Moreau had gripped the old man, was distastefully holding him away from his trim uniform. Strange took a swift step forward. There was a double-click—and the manacles locked tight on the wrists of the *capitaine!*

CHAPTER IV

MONSTER OF THE AIR

AMAZEMENT, then sheer rage, leaped into Moreau's face. Strange jerked him off balance, and the waiting lieutenant whipped a towel over the man's lips. A strangled oath was audible

through the thick folds, as Moreau furiously swung his manacled hands.

Strange sprang aside, and the steel cuffs harmlessly grazed his shoulder. He whirled, struck the edge of his right hand against the back of the prisoner's neck. Moreau's face turned ashen, and his knees began to sag. Strange hastily lowered him into a chair, turned toward the hall-door.

"Thank you, *capitaine*," he said in a loud voice. "I don't think Jacques will give us any more trouble now."

THE old peasant had cringed back into a corner, while Jordan and Todd were speechless with astonishment. The colonel was the first to recover his breath.

"Are you crazy, Strange?" he burst out. "This man hasn't—"

Strange gave him a quick, warning look. "He's dangerous. Wait and I'll prove it."

The lieutenant, taking advantage of the prisoner's half senseless condition, had hurriedly removed the towel and was taping the man's lips shut. After a swift glance, Strange turned back to Jordan, but the G-2 chief erupted into angry speech before he could stop him.

"This man is a French officer! If you've anything—"

There was a muffled sound at the door as of some one running away down the hall. Strange had jumped to the door at Jordan's first words, but Major Todd stumbled against him in his haste



to get out of the way. By the time he reached the hall there was no one in sight but an orderly who had just come around a corner.

"Did anyone just run past you?" Strange asked quickly.

"No, sir," said the man, "I didn't see anybody. Something wrong, captain?"

"No," said Strange. He looked toward the stairs which gave access to the basement and the upper floors, then went back into the office.

"When you went out," he said to the G-2 lieutenant, "did you look around as I told you?"

The other man nodded.

"Yes, and I saw a French non-com. He was a little way up the hall, but he might have been trying to listen at this door."

"Well, it's too late now," muttered Strange. "He's been tipped off in spite of my pains."

"If that's meant for me," growled Jordan, "you might warn me when you're up to something."

Strange gazed at the prisoner. "I was afraid he'd suspect. I saw that the memo made him uneasy, and I didn't want to

risk slipping one to you."

"You're sure Moreau is a spy?" demanded the colonel.

"Fairly certain," said Strange. "His story was too pat. If there'd been a visible beam we'd have seen it, too. He read that British message when he thought no one was looking."

"That still doesn't prove it," Jordan said obstinately. "G-2 will be in a fine jam if he turns out to be all right."

"Maybe these will convince you." Strange pointed to a dagger which the lieutenant was removing from a sheath in the man's belt, and a small automatic which he had already taken.

"If he's a spy," grated Jordan, with an abrupt change of front, "why are you letting the other one get away?"

Major Todd picked up the phone, but Strange shook his head.

"Wait, we may be able to trick him yet. If there isn't any alarm for him, he may think it's safe to stay around and learn what he came for."

The prisoner had partly recovered from the jiu-jitsu blow, was glaring up at Strange, making hoarse sounds back of his taped lips.

"What was the idea of that?" asked Jordan.

"To keep him from warning the man in the hall," said Strange, a trifle drily.

Jordan managed a crooked grin. "I think you taped the wrong man. I still don't get all this business. When did you suspect this fellow was a spy?"

"As soon as I heard about his death-ray story," said Strange. "It's clear now that he was sent here to plant that idea—and also to see if we'd learned anything about the truth. Of course, there's a chance that we can drag the secret out of him."

The spy's slate-blue eyes took on a fierce, defiant look. Strange sighed.

"But a slim one," he added. "My plan was to get the information from the other man—I was pretty sure some one was listening outside the door, and it was a good bet that he was working with this agent. I intended to make up like Moreau, or whatever his name is, saying a few words now and then in his voice to fool the Boche in the hall. Then I'd switch uniforms—we're nearly the same build—and go on out. The other man would probably have followed me to some quiet spot, thinking I was Moreau, to exchange information. I was hoping to trap him into betraying the truth of this Headless Death."

OLD Jacques, the peasant, had edged from his corner toward the door of the small balcony outside the office. Strange motioned to him, smiled.

"Don't be afraid, *mon pere*. No one is going to hurt you. I was only pretending, in order to fool this prisoner."

"Then I go now, *m'sieu*?" Jacques quavered.

"In a little while," said Strange. He looked at Major Todd, added in English: "Keep him here until I send you word; he might talk about our capturing this man."

Jordan scowled at the peasant.

"What did you mean," he asked Strange, "when you said this dirty

wretch knew the secret?"

A peculiar expression came into the G-2 ace's eyes.

"I said that to trick the spy listening in the hall. But Moreau's expression suddenly made me wonder—" he wheeled around to Jacques. "Are you certain nothing odd happened last night? Even the slightest unusual matter? Think carefully, and I'll see that you are paid for the pigs you lost."

The old man's faded eyes lit.

"*Merci, merci beaucoup!*" he said tremulously. "But I am so sorry, *m'sieu*, I still think of nothing that—" he stopped, shrugged his bent shoulders—"the window, when I try to open it this morning, it does not move. That is when I go out and find my poor pigs dead. Then—"

"Wait!" rapped Strange. "Were all the other windows the same way?"

"I do not know," said Jacques. "I only try to open the one in the room where I sleep."

Strange spun around toward the prisoner, a light gleaming in his eyes.

"Ah, so that worries you, *mein Herr!*"

The spy lunged up from the chair, his taped lips working furiously. Colonel Jordan shot a glance at Strange, as the lieutenant forced the spy back. "What's a stuck window got to do with this?" he rasped.

"It saved Jacques from the Headless Death, if my guess is right," said Strange. "But now it's imperative that I find the other spy and learn the rest."

He motioned swiftly to the lieutenant.

"I want the prisoner's uniform as quickly as possible. Be careful when you unlock the handcuffs; Major Todd can cover him for you. After you get his uniform, tie him securely with the rope."

The lieutenant gave the spy's pistol to Todd, reached for the handcuff key. While the Intelligence major nervously covered the German, Strange ran across the room. His leather flying-coat lay over a chair. Only the closest inspection would have shown the tiny zipper in the lining where a small make-up kit was hidden. He was about to pull the zipper when a sudden premonition of evil swept over him. In the same moment, old Jacques gave a frightened cry. Strange had already started to whirl, his right hand half lifted to the gun in his armpit holster.

"Stand still!" came a snarled command. "The first who moves, I kill!"

STRANGE froze, but his gaze flicked toward the balcony. Crouched there was a figure in the uniform of a French non-com. His pale eyes glared over the gun in his hand.

"Raise your hands—all of you!" he said harshly. Then to the other spy. "*Schnell*, Klein—I may be seen at any moment!"

One of the pseudo *capitaine's* manacles had been unlocked. He jumped back, then snatched his gun from Todd's shaking fingers. Old Jacques, terrified, darted toward the door. Klein viciously swung the steel cuffs, and the old man fell, an ugly cut in his head.

Strange's right hand was a sudden

blur of motion. The spy on the balcony frantically swerved his gun. Two shots crashed. A bullet drilled the wall behind Strange. But the spy's pale eyes dilated with a stunned horror, and blood oozed from a hole in his breast. With a desperate effort, he raised his gun in both hands.

Klein had dived for the balcony at Strange's first shot. He flung around, half-shielded by the dying man. Strange fired, hurled himself down by the desk. Klein's gun blazed over the other spy's shoulder. His bullet gouged through the edge of the desk, close to Strange's head.

Jordan suddenly plunged for the ante-room door. The dying German's last shot smoked after him, but his aim was wild. Klein threw himself over the balcony rail as the other spy slumped. He instantly dropped from sight.

Men burst into the room from the hall. Strange snapped a quick command, ran for the balcony as the others dashed out to the stairs. The crack of a shot greeted him as he sprang toward the balcony rail. He saw Klein whirl and vanish into a misty alley-way between two buildings.

Several of the headquarters guard appeared from a door below. Strange sent them after the Boche, but almost at once he heard the sputter of a hastily started motorcycle in the alley. He dashed back into the office.

"Where did he land his ship—Corps field or the 35th?" he fired at Major Todd.

"Why—I don't know," stammered the other man.

Jordan was bellowing into a phone in the next room.

"Turn out the whole guard, you idiot! The man's a German spy!"

"Tell them to rush a car to the right entrance," Strange cut in. Then he wheeled to the flustered major. "Warn both those fields to stop him! He's our only chance now."

Half a minute later, a khaki-colored Packard roared away from the headquarters building. In the rear were Strange and Jordan.

"Make for Corps field first," Strange clipped at the driver.

"The damned fools!" fumed Jordan, as the car shot through the muddy village. "Don't even know what kind of a ship he had—never called French H.Q. to check up—never even asked for his credentials."

"This Headless Death is enough to upset any headquarters," Strange said grimly.

The car skidded wildly, plunged on past an excited road-sentry. In two minutes the Corps H.Q. drome came into sight, its buildings half-shrouded in the misty drizzle. The thunder of an Hispano abruptly was audible above the roar of the car's engine.

"He's done it!" howled Jordan. "The thick-skulled half-wits! They've let him escape!"

The Packard lurched into the road to the drome, and Strange saw a crowd of men running toward one point on the line. A hundred yards away, a Spad shot into view, lifting steeply above a hangar. As the car halted, Strange and

Jordan leaped out. Several men were carrying a wounded pilot into a hutment.

"We didn't get the word until too late," a field officer hastily answered Colonel Jordan's query. "Peters was just about to take off when that Hun devil dashed onto the field, shot him and took his ship."

Strange jerked on his flying-coat. "I want a ship with a wireless set—as fast as possible!"

The officer raced down the line, shouting at the nearest mechanics. Two or three pilots had already run to their ships, bent on vengeance. The officer hauled one man back from a Nieuport just as an ackemba pulled the prop. He shook his head fiercely, beckoned to Strange. The G-2 ace turned hurriedly to Jordan.

"Sound-rangers — check Klein's course and relay to me on 450."

Before Jordan could reply, he was sprinting for the Nieuport. The angry pilot was just about to push the other man out of the way. Strange took the pit in one leap, signaled the open-mouthed mechanic. At the senior officer's hasty nod, the man pulled the chocks.

Another Nieuport was speeding out on Strange's left, and he saw the pilot glare up vindictively. The fleeing Spad was almost lost in the mists, but suddenly it nosed down and plunged at the two taxiing planes. Strange bent over the stick, held his ship close to the ground as it picked up speed. The Vickers of the stolen Spad flamed into venomous action. The man on Strange's left zoomed dizzily. Klein's tracers stabbed down at him, twisted to follow the now half-stalled Nieuport.

GROUND-GUNS suddenly burst into furious attack. Klein rolled madly to the right as three Chauchats converged near the Spad's tail. Strange brought his stick back with a quick sweep, lanced up at the German. Klein frantically turned, plunged off into the murk.

Strange's ship was an Hispano Nieuport, but it lost against the trim-lined Spad in his attempt to follow. The other Nieuport swung in near him, and he saw another Corps Spad zoom up to join the chase.

Keeping the engine wide open, he took off his helmet. One with wireless phones hung at the side of the cockpit. He put it on, let out the antenna, then switched on the receiver and set the dial. The Corps station at Grancy came in loudly. He tuned it lower, listened to the swift flow of code.

Third Corps to Neville . . . Third Corps to Neville . . .

Strange threw the sending switch, tapped out a quick reply. The message followed at once.

Stolen plane followed course 133 degrees for first two minutes. Unable to detect now from sound of other ships.

Strange changed course, then switched back to the transmitter. *Keeping trying. Inform of any change. Neville.*

As he turned on the receiver again, he saw that the other ships had closed in and were following his lead. Then he

realized that they had seen the dangling antenna and had guessed what he was doing. He raised his hand in a signal, and they motioned back.

The mist grew somewhat thinner as he climbed. He throttled the engine to 1500 r.p.m. Finding Klein now seemed hopeless, in spite of the slightly clearer air. They were probably not far apart, but the spy might be higher or lower. He had hoped to spot him, then trail him unobserved, hidden in the gray drizzle.

He looked around at the other pilots. If he were alone, he could risk going on, with the hope that he would finally spot Klein before he landed in Germany. If his suspicions were right, there would be a base of some kind—what kind he did not know. But he could not lead these pilots into Hunland, to possible capture or even death.

Reluctantly, he was about to signal for the return when a sharp da-dit-da-dit sang into his phones. He answered swiftly, switched to the receiver.

"New sound picked up, by listening post J-8, near Front, seems almost ahead of you," came the message from Grancy. *Faint hissing, not plane motor.*

Strange wiped his goggles, leaned out and gazed over the cowl. There was nothing but a dreary grayness. Station J-8 must be—

He sprang up in the pit, then flung himself back with a frantic signal to the others. From out of the mists, a gigantic plane was racing headlong at them! A monster of the air!

CHAPTER V

THE HEADLESS DEATH

HE had a flashing glimpse of a glassed-in cabin, of mighty wings stretching away ninety feet on each side of the huge hull. Then the Nieuport stood on its tail as he slammed the stick hard back. The other Nieuport had dived under the onrushing plane, and the Spad was pulling up in a steep chandelle to the left.

The giant ship seemed to leap out as Strange zoomed, then to his consternation it, too, nosed up in a furious climb. For a second he thought they would crash head-on. He saw the panic-stricken faces of the Germans at the controls.

The Nieuport's landing-gear was almost touching the giant plane's right wing. He kicked away, holding his breath. There was a jerk as the two ships swung apart. He stared back. The heavy lead "fish" at the end of his antenna had struck the German plane's wing. A wide, flat nozzle, like that of a vacuum cleaner but twenty times enlarged, had crumpled under the impact and was dangling where on support had broken near the trailing edge of the wing. There was a similar nozzle projecting back under the other wing, connected like the first with pipes leading into the hull.

It was all he had time to see. The Nieuport, stalled from his violent maneuver, suddenly dipped and spun. He brought it out, looked hastily around him. The other Nieuport was climbing steeply on his left, tracers smoking through the drizzle as the pilot warmed

his guns. Strange pulled up also, then remembered the antenna. The lead weight had broken off when it struck the German plane, but he knew the flopping wire might become entangled with his controls.

He reeled it in, climbed again. The clatter of guns came faintly to his ears above the Hisso's roar. The sound swelled, and he ruddered in that direction. Soon he could see the mystery ship, a fast-moving blur in the murky sky. The Spad was diving at it, Vickers blazing.

Strange tripped his own guns, warmed them with two quick bursts. The huge plane banked sharply, and he saw that it was a giant amphibian, with its wheels drawn up into recesses in the massive hull. Machine-guns were spitting from ports in the main deck. As he charged in, a Spandau twitched toward him from the rear of the raised control cabin. He crouched, swung his ship to bring the cabin in his sights.

Spandau bullets gouged through his top wing. He squeezed his trips again, pumped two quick blasts at the German gunner. Slug-marks appeared in the glass above the Spandau, but the bullets did not go through. The Boche loosed another fiery blast. Strange rolled clear for a different approach. The tail-surfaces were probably heavily strengthened, but if he could clip one or two wires

He stared around. The Germans had zoomed again, were apparently trying to escape. The Spad was boring up underneath, guns hammering at the hull. As Strange quickly turned, the second Nieuport hurled near him. The pilot was leaning out the opposite side of his cockpit and had not seen him. Strange kicked clear, nosed down to pick up speed. He was swerving back when he saw a mass of white flakes fluttering down through the air. From some mysterious cause, the drizzling rain seemed to be turning into snow.

He stared upward, then reversed with a screech of wings. A stream of whitish vapor was billowing back from the unharmed flare-shaped nozzle. It was this strange substance which had spread out to appear like falling snow.

The second Nieuport was plunging straight under the snow-like cloud. Strange whipped into a vertical turn, flung two streaks of tracer across the other man's path to make him turn. Then a groan rose to his lips. For the Nieuport had hastily climbed instead of swerving away.

As the pilot saw the whitish cloud, he threw back his head and gazed up in astonishment. Abruptly, he seemed to realize that it was something more deadly than snow. He banked frantically, but the Nieuport was already in the edge of the cloud. It twisted aside, one wing heavily crusted, the pilot's face white with the clinging flakes. Strange waited, helpless, sick with dread of what was coming.

A look of relief crossed the pilot's whitened face as nothing happened. He raised his bare hand to wipe away the flakes. Already dwindling, they melted at his touch, and suddenly a weird aura

began to dance about his face. He dropped the stick, madly wiped his dripping cheeks with his sleeve.

Strange groaned at what he saw.

The first faint glow of the deadly blue light had appeared. In a moment more

THE unguided Nieuport skidded sharply, dived off into the cloud of melting white flakes. As its hot engine plunged into the now hazy vapor there came a deafening roar. A dazzling flash and both pilot and plane were gone!

The force of the blast tossed Strange's ship upward like a leaf. As he fought the jerking controls he saw the giant plane. It was straightening out of a turn, and now the Spad which had accompanied the two Nieuports pitched down at its tail. From a gun-cockpit midway on the long hull, a Boche with twin Parabellums was fiercely raking the fighter. Strange battled the Nieuport into a hasty renversement. His tracers were almost centered on the Boche gunner when the giant ship swiftly nosed down.

A thick stream of that deadly white vapor abruptly gushed back from under the wing. Before the Spad pilot could turn, his ship had hurtled into the billowing mass. For a dreadful instant, Strange saw the doomed man—like a grotesque Jack Frost figure in a plane modeled of snow. Then a second fierce explosion rocked the sky, and only a whirl of blue smoke showed where the Spad and its pilot had been.

As the Spad blew to pieces, the giant plane banked quickly. Strange chandelled at furious speed, and the stream of white vapor passed underneath the Nieuport. The German ship swept up after him, and tracers from two directions crackled past his head.

He threw the Nieuport about in a lightning split. Oblivious to the hail of slugs pounding into his wings, he dived at the control cabin. Two more Boche machine-guns blazed into action. A strut cracked, and his rudder went partly slack under a blast at the tail.

His tracers were ricocheting from the roof of the cabin, and he saw his attack had failed. He braced himself, rolled tightly to the left. It was futile to try to down the German ship. But if he could follow it to its hiding-place . . .

T-t-t-t-t-t! He jumped back in the seat. One of the gunners had sent a burst through the cockpit! The fabric at his side was still smoldering from where tracers had pierced it.

With swift inspiration, Strange lunged on the stick, letting his head loll sidewise. The Nieuport went up at a crooked angle, slipped off and wobbled down the sky. He let it fall a thousand feet before he began to pull out. The cracked strut trembled as he gingerly broke the increasing dive, but he brought the ship to level flight without disaster. He drew a long breath, looked up through the mists. He could just barely see the huge amphibian.

Remembering the fateful white flakes, he grimly turned the Nieuport aside. The Germans probably did not see him. They undoubtedly thought he was dead,

that the ship had already crashed. But he would take no chances now, with success almost in his grasp.

He had learned the secret of the Headless Death. One final step, and the Allied airmen could strike and blot out that death-laden plane. He hesitated, looking up grimly to keep that blurred shape in view. He could go back, get help, and start a search for the giant craft. But scores of pilots and thousands of other men might die before they could find its base. There was only one thing to do.

Carefully, he began to climb again. The Germans had turned, were flying southeast. He flew a parallel course, keeping far off to the right. So faint was the image of the huge ship that twice he thought he had lost it. He wiped his goggles constantly, straining his eyes to see the Boche plane. After a while he looked at the clock. It was only a little after nine. But it seemed that an age had passed since he had seen those first headless men out in the English Channel.

He shivered as he thought of how many more might die that same way. He had suspected some kind of gas, after hearing old Jacques' story. It had been evident that the old peasant was alive only because he slept in a tightly closed room. The stuck window had probably been caused by the mysterious vapor which had fallen, unsuspected, in the rain.

That was the most dreadful part of it. Wherever rain or mist was falling, the Germans could drop that terrible vapor-explosive with hardly a chance of detection. Whatever it was, it was clearly dangerous to the highest degree—except in a frozen state. The slightest warmth would obviously set it off. He shuddered again as he remembered Jack Conway's dripping face.

Somewhere in his wild flight to warn them, Conway must have encountered the giant plane—had attempted to bring it down. In the battle, he must have flown into a cloud of the vapor. Then knowing he was doomed he had hurtled down to warn them before he died. But why hadn't the heat of his engine caused an explosion when he flew into the vapor?

Strange frowned, then thoughtfully nodded. That would explain it. Then poor Conway must have known the Germans' course

HE gazed ahead at the giant amphibian. It was slowly descending. He glanced again at the clock, made a hurried calculation. If the wind had not changed direction, they must be between the Upper Vosges and the Black Mountains, about thirty miles south of Strasbourg. That meant the Rhine was their goal.

With quickened pulses, he warily closed the gap. Now, above all, was the time for caution. It would be better to hold his altitude for a minute, then spiral down above the huge ship and see where it landed. After that, a swift flight back to France

His exultation speedily died. Three seaplanes, ghostly gray shapes in the

mist, had appeared near the giant ship. They swept into a circle above it as the pilots of the great amphibian spiraled down.

Strange had twisted away at first sight of the three planes. The officers of the amphibian might have flashed word ahead to arrange for this protection, suspecting they were being followed. Or it might be a routine procedure. But his best plan was to keep out of sight for a minute or two and then carry out his intention.

He flew straight West, watching the clock. Exactly on the second minute, he swung back, heading East. As he neared the place where the seaplanes had been circling he prepared for a quick turn. But they were not to be seen. He banked, gazed around sharply. It might be a trap—they might have seen him the first time.

After a few seconds he throttled the Hispano, cautiously started down. The altimeter showed almost two thousand feet, but he knew there was rugged terrain below him. Proof of his calculations was immediately visible. The ruin of an old castle showed dimly atop a jutting rock at his left. He edged away, peering down into the haze-filled valley beneath.

There lay the Rhine, winding between two frowning walls. He could vaguely see a desolate-looking village on the eastern bank, and near it a narrow clearing marked with a landing "T." He



veered in the other direction, closing the throttle to idling. It was impossible for the giant amphibian to have landed on that narrow field, but he had no desire for the Germans there to see him.

Ready for quick action, he glided down over the Rhine. The river was wide enough here for an expert to land the big ship. He gazed ahead eagerly, but to his dismay there was no sign of the amphibian or the three seaplanes. Banking steeply, he turned back. The Germans had given every sign of intending to land. Could it have been a maneuver to trick anyone following them?

He sat up abruptly. There where the Rhine narrowed was a bridge of planks laid on several boats. Conway's words flashed into his mind.

"North—bridge of boats—"

The water above which he was flying lay just north of the pontoon bridge. He cast a glance at the western bank. A road paralleled the river; that was all on the western side. He turned for a swift look at the eastern bank, above which the empty-looking village was perched. There was something odd about that village it had an out-thrust look, where most Rhine villages nestled

He felt a sudden tingling along his

spine. He was in danger—he could feel it clearly. Then he must be getting close to the base!

B-r-r-r-r-t-t-t-t-t-t! From directly above him came the fierce, hard pound of twin-guns. Bullets smashed through the Nieuport's already weakened wing. Strange ramméd the throttle open, back-sticked in a fast chandelle. He had been expecting attack from hidden defense guns along the river banks. This blast from the air had caught him off guard.

He flung a quick look over his shoulder as the Nieuport roared up past the rocks. A Third Corps Spad was rocketing down at him, both its Vickers aflame. And glaring over the guns was the face of Klein, the spy!

CHAPTER VI

"I AM Z-29"

SO close was the Spad that Strange seemed to be looking right into the spy's blazing Vickers. He booted the rudder hard to the corner, and the Nieuport howled down in a slip. The hail of lead which had been about to pound into his back swept off into space.

A baffled look came into Klein's face. He kicked the Spad around to bring Strange under his guns. The G-2 ace banked swiftly, and the shuddering Nieuport roared toward the rocky walls on the western side of the Rhine. The pinnacle on which the ruined castle stood was almost in his path. He twisted around it, and Klein's vengeful fusillade thudded into the rocks.

As the pinnacle briefly hid him, Strange zoomed. The Spad charged into sight, then Klein pulled up hastily as he saw the Nieuport above him. Strange flung back, turning on the stronger wing. The tail of the spy's plane crossed in front of his sights.

He tripped his guns, saw bits of fabric fly from the Spad's rudder. Klein wildly skidded, pitched down in a dive. Strange curved back around the pinnacle, nursing the crippled ship. His guess had been right. The spy was now in a chandelle, climbing back, expecting to be on the Nieuport's tail.

Strange plunged down, holding his fire. Klein desperately tried to dart away. Strange pumped out two bursts, drove him back toward the rocks. As the spy saw destruction before him, he whirled like a cornered rat. Strange clamped his trips hard together. The empty ends of his ammo belts were thrashing through his guns—but he had scored!

Black smoke was pouring from under the Spad's cowl. Klein hurled the ship toward the river in a screaming forward slip. Strange let up on his Bowden triggers, slowly pulled the stick back. A ragged piece of fabric suddenly tore loose from the leading edge of the wing. A muffled crack reached his ears, and the Nieuport began a fierce vibration. He knew without looking that the fractured strut had collapsed.

Another strip of cloth whipped loose, flapped in the inter-bay wires. Strange stared at the wing framework. There was an ominous crack in the forward

spar. It widened even as he watched it.

Klein's plane had dropped into the Rhine, close to the western bank. The smoke which hid the wreck began to dissipate. But Strange had no time to determine the spy's fate. The Nieuport was about to go to pieces in the air. Half-closing the throttle, he looked anxiously toward the narrow T-marked field. There was a chance of making it. He carefully turned the trembling plane.

He could see a small crowd of men on the field. Beyond them were two planes. He could not be certain because of the misty sky, but he thought they were Fokker triplanes. Even if he reached that narrow landing strip between the rugged hills, his chances of tricking the Germans and seizing a plane were almost negligible. But he had no other choice.

The cracked spar took on a new vibration. Strange eased the Hispano a trifle, and the trembling stopped. But the loss in speed was fatal. He saw now that he would fall short, would crash into the precipitous rocks below the village if he did not turn.

There was a small, slanting area at the foot of the cliff, from which a road curved up and disappeared among the rocks. The bridge of boats ended at this point. He tried to turn, but the slack rudder refused to act without the slipstream of the engine. The Nieuport wobbled down toward the middle of the river.

The ship was barely fifty feet above the water. Strange shoved up his goggles, pushed the stick forward. The plane lurched down toward the frail-looking bridge. With a jerk, he back-sticked. The cracked spar broke, and the Nieuport dropped on its sagging wing. It struck the water close to one of the boats, and the broken wing telescoped.

Strange had thrown his arms before his face. His head thumped hard against them, and the violent pull of his belt took his breath for a moment. He forced himself to snap open the safety-buckle, then climbed over the top wing. The impact had split the bridge, and both sections were swinging downstream. He jumped to the eastern side just as the Nieuport pulled loose and began to sink.

The section to which he had jumped was still anchored to the shore. He started to run, fearing it might pull loose. It was about four hundred feet to the river bank. He had gone only a short distance when he saw a squad of German soldiers running along at the foot of the cliff. They were making for the end of the bridge to intercept him.

He gazed past them. They seemed to have come from nowhere . . . Then he saw the answer. The steep face of the cliff was moving, folding perpendicularly like a huge accordion. A natural indentation in the river was revealed. The Germans had covered it with a truss-work at the top, building a false village on the platform thus created. The folding cliff was only a high, camouflaged door, cleverly matched with the front edge of truss-work above.

The result was a secret hiding-place under the false village, like a mammoth

boat-house built at the side of the Rhine. Strange could see the huge amphibian floating inside the base. Small launches were turning it around, nosing it toward the river. Two of its six engines were still running.

THE squad of Germans had reached the end of the bridge. They waited, rifles lifted, as he ran toward them. Strange cast a hasty glance backward. The wrecked Spad was just visible across the river, and he could see nothing of Klein. He looked toward the waiting Heinies. There was one officer with them, an *Unter-Leutnant*. Everything depended now on that one Boche. If he could work a colossal bluff on the man . . .

"*Handen hoch!*" the *Leutnant* cried out, while he was still a hundred feet away. "Raise your hands! Halt!"

"*Dumkopf!*" Strange snarled in perfect German. "If I were an enemy, would I run toward you? Use your stupid head!"

The haughtiest Prussian would have envied his arrogant tone. He saw the uncertain look on the *Leutnant's* sallow face, swiftly followed up his first success.

"Two or three more of the Yankee swine followed me. They may be circling down here! Send a man to the base—warn them to close the entry again!"

"But—but how do I know you are not an Allied pilot?" demanded the officer, dubiously.

Strange had approached to within a few feet of the squad. Disregarding the Heinies' rifles, he glared at the *Leutnant*.

"A phone call to Intelligence Headquarters at Strassbourg will prove that! Get these fools back and I will give you my code number."

Keeping his Luger poised, the Boche officer mumbled a command to his men. They fell back a short distance, staring at Strange.

"I am Z-29, of the K.N.A.," Strange told the *Leutnant* in a low, harsh voice. "I have just come from Graney. I was almost caught through the stupidity of a minor agent named Klein."

"*Mein Gott!*" cried the Boche. "Has *Herr Klein* been captured?"

"Ja," said Strange, impatiently. "And because of that imbecile I nearly lost my life. He is the one who set the *verdammte* Yankees after me. At least three of their pilots followed me when I escaped."

"*Himmel!*" exclaimed the other man. "Corporal, take word to the *Rittmeister* that more enemy ships are near."

"That is only part of it," Strange went on harshly, as the enlisted man dashed away. "I have vital information which I must take personally to Strassbourg at once. Come with me up to the field—you can establish my identity while the mechanics start a Fokker for me."

"But the *Rittmeister* told me to bring you to him," protested the *Leutnant*. Suspicion began to come back into his eyes.

"Very well," snapped Strange, "but you will regret it if I am delayed."

He rudely pushed by the other man, strode toward the base. The *Leutnant* and his squad hastened along behind him.

"Perhaps, *mein Herr*," said the junior officer placatingly, "you can use one of the special Brandenburgs. They are as fast as the Fokkers. You could land on the River Ill, at Strassbourg, and not lose any time that way."

"Send a man to order one started immediately," grated Strange. If he kept up his arrogant manner, he might win yet. He had purposely called himself an agent of the K.N.A., knowing that mention of the Kaiser's special group of agents would probably awe the *Unter-Leutnant*. Z-29, he knew, was a number recently vacated because of the death of a Boche spy who had been shot by the French. It was possible that German Intelligence had not learned of the man's death—and quite probable that the Strassbourg division had not been informed at once.

He looked quickly toward the base as they approached. Several Germans, officers and mechanics both, were standing on the rocky ledge at the left of the folding walls. The corporal had already given them Strange's message, and the high camouflaged folds were beginning to spread out in a wall, as concealed mechanism went into operation.

STRANGE mentally braced himself as he saw the *Rittmeister*. This man would be harder to fool than the German shavetail. He purposely let his flying-coat swing open, showing that he wore no blouse. The *Rittmeister* stared at his olive-drab breeches, looked at the Boche lieutenant.

"Your corporal brought word that this man was a German. How do you know that?"

"He is an agent, *Herr Rittmeister*," the *Leutnant* exclaimed.

Strange let him start to explain, then curtly interrupted.

"We're wasting time!" he snapped at the senior man. "The matter is simple. I was established as a Yankee major at American Third Corps Headquarters when that thick-headed Klein made a mistake and exposed me. I managed to twist out of my blouse and escape from my guards. I tricked them and reached the Corps field, but I was followed by three or four planes. I shook off all but the Spad. You saw what happened to that *Teufel!*"

The *Rittmeister's* gaze shifted across the Rhine.

"Yes, I saw." His voice held a thoughtful note. "I have already telephoned across to the river patrol station. They will bring the pilot here in their boat."

Strange shrugged.

"I think he was killed, but it is not important. I have more information than you could get from him. The secret is safe—unless they force Klein to talk."

He saw the Germans stiffen.

"No member of the Red Skull Staffel will ever betray his country, *mein Herr*," said the *Rittmeister* coldly.

Strange hid his surprise on learning Klein's status.

"It was a mistake to send him across

as an agent," he said harshly. "The Americans discovered who he was in less than an hour."

"The situation was desperate," muttered the other man. "We had to make an attempt to hide the truth, after we heard what had happened. But now I suppose Klein's story will not be believed."

"Of course not," snapped Strange. "The Yankees are fools—but not to that extent. They know now it is not a death-ray—but they still had no idea of the truth when I escaped."

The *Rittmeister* looked uneasy.

"Even so, the *Kommandant* will be furious. And there is another thing to anger him. We were attacked by three American planes—*Ach!* They must have been the ones which pursued you. That is why they were on the direct course from here to Grancy."

"Did you down them?" Strange asked with assumed anxiety.

"*Ja*, but one of them almost struck us head-on. It was a miracle we escaped. At that, his wireless antenna-weight hit one of the release nozzles and wrecked it."

Strange let his face twist into a scowl. The *Rittmeister* evidently had not been in the control cabin, during that moment of near collision, or at least not near the bow. But one of the ship's pilots might appear at any moment and recognize him.

"You said you had information for us?" the senior German asked. It was apparent that he had about accepted Strange's story.

"I have," returned Strange. "Also, personal information of another nature for the command at Strassbourg."

"You can telephone Strassbourg by our private wire," said the *Rittmeister*. "But this other . . . ?"

"The Americans have ordered six squadrons to the Fifth Wing field," Strange invented rapidly. "They believe they will be safe there—that the 'Headless Death' will not strike twice in the same place. Also, Third Corps Headquarters is moving into dugouts near there as soon as possible—the officers will be transferred by noon, at the latest. You can destroy them and the airmen with one stroke."

"*Sehr gut!*" exclaimed the *Rittmeister*. "We just received word they were going to concentrate at some point, but the agent relaying it did not know where. As soon as the repairs have been made, we can take off again."

Strange nodded, his mind struggling with the problem of escape. It was dangerous to insist on a plane, after the German's mention of the private Strassbourg wire. He might possibly say that the information concerned a suspected Allied agent in the German Headquarters . . . that he could not risk the telephone . . .

"A plane!" one of the Germans said suddenly.

Strange and others wheeled. The faint drone increased, echoed between the rock walls. The *Rittmeister* had sprung toward the almost closed doors. Then he stopped.

"It is one of our own ships," he said

with relief.

A seaplane came into sight, swooped down to a landing nearby. It was a Brandenburg, one of the three which had guarded the amphibian in its descent, Strange surmised. Here was an unlooked-for opportunity. If he could quickly convince the *Rittmeister*, then take this ship . . .

The seaplane's engine died, and the Brandenburg drifted in to the shore. Three mechanics ran to seize the wing. With a growl at the man in the rear, the pilot stepped from the front pit to the wing, then jumped to the ground. Angrily, he pushed up his goggles and came toward the group of Germans.

As Strange saw that savage face he went rigid. The pilot was Wolf von Munster!

CHAPTER VII

SEAPLANE SACRIFICE

"**D**PLUNDERING idiots!" the baron snarled at the others. "In one night you nearly ruin the work of—"

His words broke as he saw Strange. The G-2 ace had waited, motionless, hoping that von Munster would not recognize him from that fleeting glimpse in their battle. But a furious glare shot into the baron's eyes.

"*Spion!*" he roared. "Seize him, you dim-witted fools!"

Strange snatched the gun under his flying-coat, but five or six men were upon him in a twinkling. He clubbed the weapon, crashed it on one man's head. The German dropped. Two others gripped his arm, and the gun was torn loose with a bone-twisting jerk. He was borne to the ground by the sheer weight of numbers.

"Get him up!" ordered von Munster. "Let me look at this *Schweinhund* before I have him shot."

The Germans obeyed, two of them holding Strange tightly. Von Munster stepped closer, his brutal face distorted with rage.

"*Ja*, this is the one!" he rasped. He slapped Strange fiercely across the mouth, gave him another blow which made his head swim. Then he whirled savagely to the *Rittmeister*. "And you, Weiller! Letting this Yankee hoodwink you!"

"I suspected him all the time, *Herr Baron*," faltered the other man. "I was only waiting to be sure."

"What was he doing? How did he get here?" von Munster thundered.

Weiller explained, cringing under the baron's angry gaze. Von Munster cursed him roundly when he had finished.

"Go back to the nursery! A three-year-old could trick you without half trying." The *Rittmeister* flushed.

"But his story—he knew about Klein—he did not act afraid—"

"The man is probably a trained spy," von Munster ended his halting explanations. "The Yankees must have sent for him to come from London. He almost shot me down in the Channel, when I flew out to inspect your work on that vessel."

"Then—the man in the Spad must

have been a German!" exclaimed Weiller. "This spy would not have shot him down otherwise."

"Send one of the motorboats out there," the baron tossed at an officer.

"I think the patrol-boat is already bringing the pilot, *Herr Baron*," said the Boche hesitantly. He pointed across the misty water.

"It's Klein!" snarled von Munster, as the boat drew closer. "But at least he is not badly hurt!"

In a few moments the boat grounded on the ledge at the side of the base. Klein jumped out, his face bruised and streaked with soot, his uniform torn and wet. He lunged at Strange, but the baron pushed him aside.

"Time enough for that afterward. How much have the Allies learned?"

"Nothing," Klein said thickly through bruised lips. "But I think this devil was near the answer."

He described the incidents in Major Todd's office. Von Munster looked angrily at Weiller.

"None of this would have happened but for your stupidity—flying thirty kilometers with a leaking release valve!"

"I was in the chart-room," protested the *Rittmeister*. "I had no way of knowing—"

"You were in charge," roared von Munster. "The High Command will hold you responsible for those dead German soldiers. But the worst is the way you upset all our plans. Instead of focusing the Allies' attention on the Channel, so they would think it was done by a U-boat, you all but draw a line pointing here!"

"The 'death lane' doesn't point this way, *Herr Baron*," said Klein. "The ship had turned, so it points about fifteen degrees to the North. The Yankees will waste their time following that course."

Von Munster's brows held a deep frown.

"Perhaps so," he growled, "but what is this report about a strafe of the American 5th Wing? I heard it when I was changing planes on the way down from Zeebrugge."

One of the Boche officers looked frightened. Weiller spoke with a faint hint of triumph.

"At least that can not be blamed on me, *Herr Baron*. We were flying back after the tests in the Channel when I received a wireless from *Uber-Leutnant* Schmidt here. It said there had been another spy at the base, beside the man we caught last night, and that he had escaped in one of the Fokkers. From a marked map the man dropped, Schmidt said he thought he was making for the Yankee 5th Wing field. We flew in that direction, and sighted him at the last moment, but he was above us. He dived past before we could get him in range. We followed down, estimated our location from wireless bearings, and released a full tank of the vapor. I thought it was absolutely necessary—"

"Naturally, after he escaped with the secret!" snarled von Munster. "But how do you know you got him, even then?"

Klein interrupted.

"The pilot must have gone through

the spray, after all. His head was blown off right after he landed. I learned that when I reached Grancy. I tried to cover up the whole thing with the death-ray idea—"

"We're through covering up!" grated von Munster. "We won't wait to build up a reserve supply of the gas. Weiller, how soon will that release nozzle be repaired?"

"In a few minutes," said the *Rittmeister*.

"Put a double-shift on it!" ordered von Munster. "We start main operations as soon as the ship is ready. The first place we strike is this Yankee Third Corps. There are two dromes close by, and seven more in half an hour's flight."

ALL the Germans but Klein and Strange's guards scattered. The baron turned to Strange. Slowly, he drew a pistol from the holster at his hip.

"Wait, *Herr Baron!*" Klein said hurriedly. "This man is no ordinary spy." Von Munster's fierce eyes blazed.

"Ordinary or not—he dies!"

"But is it worth two hundred thousand marks to kill him?" cried Klein.

Von Munster stared. "What do you mean by that?"

"This man is Captain Strange, the one they call the Brain-Devil!" exclaimed Klein. "There is a reward of two hundred thousand marks if he is captured alive—half that if he is dead."

A mixture of emotions showed on the baron's hard face. Finally he lowered his gun.

"Put him in with the other prisoner and double the watch on the door," he ordered the staring guards. Then he turned, and Strange heard him speak in a lowered voice to Klein, "Slip away and get a car from up on the Fokker field. I want you to deliver this man to Strassbourg Headquarters before the others get any idea of sharing the the money."

Klein mumbled something which Strange could not hear.

"I'll see that you are satisfied," came von Munster's harsh answer.

The guards pushed Strange through a small opening at the left corner of the folding wall. A strip of canvas dropped in place behind them, and they went on along the ledge. The space back of the odd folding walls was amply lighted. He saw wires running up to the wide truss-platform which roofed the base, and guessed that a few lights had been installed in the false village to deceive anyone spying around the area at night.

The stretch of water on which the amphibian floated was about five hundred feet wide and at least two-thirds that long from the camouflaged walls to the rear. The result of the artificial cliff and the trussed roof was a cavern-like space in which three or four motor-boats, Brandenburgs, and floating supply platforms were housed. The amphibian was in the center. It had been turned around so that its nose pointed outward. Working platforms on pontoons had been brought alongside, and mechanics swarmed over the huge ship.

Strange saw as much as he could as his captors hustled him along. The crumpled release nozzle had been removed and a new one was being fastened in place. Another crew was quickly connecting it with the pipes which led inside the hull. On another floating platform, a small derrick was hoisting up square tanks painted blue. There were pipe connections and sealed valves on top of the tanks, and he noticed that each one was covered with frost. It was clear that the Germans kept the deadly vapor in a refrigerator until it was put on board. Probably there was a similar cooling system in the chamber where the tanks were connected.

Along the ledge was a row of shed-like rooms, evidently for storing materials. Strange saw a few fitted as quarters, but he could tell that only a small detail normally remained here. Quarters for the officers and most of the enlisted men were obviously somewhere else.

Only a few Germans were on the ledge, and these were scurrying about so that they paid scant attention as Strange was marched by. But the base was brightly lighted, and even if he succeeded in a quick break he knew he would be caught before he could reach the entry.

The two men halted him at the door of a solid-looking, windowless shed, where a big German in grimy dungarees stood guard with a Luger in his belt.

"Unlock the door, Hermann," said one of Strange's captors. "We have another chicken for your coop. But be ready to open your eyes. This one is—"

"Keep still," muttered the man on Strange's right, "or the baron will have you flogged."

Hermann stared at Strange from under his bushy brows, then grunted and produced a padlock key. Putting his hand on his Luger, he opened the door and looked inside. He grunted again, and the two men pushed Strange into the shed. The door banged shut.

THERE was one electric light in the shed, suspended from a rafter. It shone down on a man in the soiled garb of a mechanic. He was lying hopelessly on the straw-covered floor, but as he saw Strange he bounded to his feet. Under the dirt, Strange recognized the face of Bill Brooks.

"Good Lord!" Brooks groaned. "So they got you, too!"

"Yes, I guess it's the finish," Strange said gloomily.

Then with a hasty signal for silence, he put his lips to the other man's ear. "Don't ask questions, but get out of those clothes as fast as you can."

Brooks looked dazed, then quickly began to shed the dungarees he wore. Strange laid his flying-coat on the floor, sat down and pulled off his boots. His olive-drab breeches and shirt followed.

"Get into those," he whispered to Brooks. Then in a louder, gloomy voice, "Well, only a fool would expect to beat this game. I should have stayed in the Air Service."

"What in hell is the idea?" Brooks said in an undertone, as he put on the

uniform breeches.

"Chance for a break—tell you the rest in a minute," Strange muttered. He stepped into the dungaree trousers, took Brooks' shoes. They were a bad fit, but he laced them as best he could. Putting on the coat, he quickly knelt and took his make-up kit from its hiding-place. Crepe hair, scissors, tiny tubes of greaseless paint, and lining pencils were swiftly laid in a row. He propped the kit against the wall, so that the light shone on the mirror. As he set to work he jerked his head toward Brooks.

"Talk," he whispered. "They'll be suspicious if we're quiet. Tell me how they got you—anything."

Brooks nodded, his eyes still dazed.

"They caught me last night," he mumbled. "I'd been here two days. Conway had been here a week, but he couldn't get away. They were suspicious, but not sure about him."

"Louder," whispered Strange, as Brooks paused.

"Conway made a break this morning," Brooks went on dully, but in a raised voice. "He was going to try for a Fokker—I don't know whether he made it."

Strange's partly altered face grew hard.

"Conway's dead," he said. "That damned vapor killed him."

Brooks turned a sickly white under his dirt.

"My Lord!" he said huskily. His tortured eyes stared at Strange, then he forced himself to keep talking. "It's terrible, that stuff. It's nitrosocamphor gas mixed with something that makes it freeze in small flakes. Von Munster worked it out—he was a research chemical officer for the German Navy. They have to keep it frozen. When it melts it expands—makes a cloud of gas. You can't breathe it—it'll even drive men out of a dug-out, unless it's almost air-tight."

"I know," said Strange. He was thinking of old Jacques, the sole survivor in the midst of the death-lane. Old Jacques, who slept with his window tightly shut—who was used to foul air no normal person could breathe.

"That isn't all," Brooks went on fiercely. "But—I guess you know—if Conway—"

Strange stared into the mirror, at the bushy crepe eyebrows he had fastened over his own with spirit gum.

"Yes—I know what it does." As he swiftly worked on, he told Brooks what had happened. The other man's hands clenched convulsively as he described the horror at the Fifth Wing. Strange stopped, realizing his intent to arouse Brooks to a fighting pitch had succeeded too soon.

"I need your help," he said in a lowered voice. "Take these extra tubes of paint, squeeze them into the fingers of one of my gloves. Wad the stuff in hard."

Brooks stared at Strange's made-up face.

"What in the name of—"

"Quick!" Strange cut in. He drew a glove from his flying-coat pocket. "We'll have only a few minutes, and we've got

to be ready."

BROOKS took the paint tubes, hurriedly squeezed their contents into the glove. Strange took a final look in the mirror, jumped up. He put his ear against the door, but could hear only a mumble of voices. The sounds of activity from the direction of the big plane made the words unintelligible. He turned back. Brooks had finished his task.

"Stand under the light," Strange said hastily. "I'll have to change you enough to pass if we ever get out of here."

He swabbed at Brooks' face with a cold-cream pad, got rid of most of the grime. Lining pencils flicked back and forth in his swift-moving fingers. The other agent's face took on a leaner appearance, a grimness about the mouth. Strange smiled without any mirth. It was peculiar, seeing his own features begin to appear on another man's face

Above the general sounds of confusion came the roar of an engine. It rose, was quickly muffled. Brooks stared into Strange's eyes.

"It's the big ship! I can tell by the way that special muffler cut in!"

Strange stifled a groan. He had not counted on the German's making such speed. If von Munster took off now, his desperate scheme would fail.

"Do the Brandenburgs go out first?" he asked tautly.

"I don't know," said Brooks. "I was locked up when—"

They both stiffened. The voices outside were suddenly raised, and a third one was audible.

"The last one, Hermann—and be quick!"

Strange threw the make-up kit to one side, frantically tossed his flying-coat at Brooks. As the other man plunged his arms into it, the padlock clinked against the door. Strange thrust the scissors into Brooks' fingers.

"Tempered steel! Up your sleeve—now turn this way!"

He jammed his helmet onto Brooks's head, flung him the goggles and sprang back. The door was starting to open. He reached down, snatched the glove. The solid make-up paint was like lead in the fingers. He gripped the other end, stepped back with his hand behind him.

Hermann came into the room, his Luger poised. At his elbow was one of the two Heinies who had guarded Strange. Brooks was standing where Strange had motioned him, so that Hermann's eyes fell on him first. The big German stepped toward him. The second man looked around at Strange.

Absolute stupefaction stopped him in his tracks as he saw what appeared to be a second Hermann. Strange leaped before the Boche had time to recover his senses. His loaded glove smashed like a heavy blackjack onto the German's head.

The man crumpled and fell without a sound. Strange wrenched the gun from his hand, just as Hermann whirled. The big Boche jumped back as though he had seen a ghost. Brooks' hands shot

around Hermann's throat, choking off the man's startled yell. They both crashed to the floor.

Strange kicked Hermann's Luger from his hand, spun around to the doorway. Klein was half-way inside, a gun clutched in his fist. Without a second look at Strange, he darted toward the others. Strange swiftly closed the door, wheeled back. He thrust his pistol between Klein's shoulder-blades just as the spy saw Hermann.

"Drop your gun!" he rapped out.

The weapon thudded on the straw-littered floor. Strange shoved Klein against the wall, held him there at gun-point and looked down. Brooks was just getting to his feet, and Strange had the startling experience of looking at his own stunned face.

"I had to do it," Brooks whispered. "He almost had the gun."

The make-up scissors were nearly buried in Hermann's throat.

"Don't waste any feeling on these men," Strange said curtly. He swung Klein around, searched him for other weapons. The German looked incredulously from Strange's made-up face to Hermann.

"*Lieber Gott!*" he said in a hoarse voice.

"Never mind that," snapped Strange. He shoved the Boche toward the door. "Take that other gun, Brooks. Stick it in your belt, out of sight."

The steady drone of at least two Mercedes engines was filling the base with thunder. Strange opened the door, shot a keen look around. The big ship had been towed outside. The folding walls were drawn back so that the entry could clearly be seen. Two Brandenburgs were taxiing out, and a third one was being started. Except for the men at the third ship, all the personnel appeared to be out on the ledge at the front.

"Come on," Strange said to Brooks, who was covering Klein. "We've got to reach that third ship."

THEY hurried forward, with the spy moving between them, white-faced under his bruises. Strange abruptly reached out and took the gun in Brooks' hand.

"We're getting close—and you're supposed to be a prisoner. Keep just ahead of me."

The third Brandenburg was alongside the inner ledge, a buffer protecting its pontoons from scraping the rocks. Strange quickly glanced beyond it toward the huge death-ship. The bullet-proof glass panels on the starboard side of the control cabin had been slid back, so that von Munster could shout something to the men on the ledge. A mass of instruments, controls and special valves could be seen behind the baron.

Under his make-up, Strange's face hardened with determination. One well-aimed burst through that open bay

"They're starting!" Brooks cried out. Strange jerked his eyes toward the Brandenburg. With a tigerish spring, Klein hurtled against him. Strange's feet slipped on the wet ledge, and one of the guns went clattering over the rocks. Brooks had dashed toward the Branden-

burg as it began to move. As Strange scrambled to his feet he saw Brooks seize the left wingtip and swing the ship around.

Klein had scooped up the other gun. He spun madly, blazed a shot at Strange. The slug tore through Strange's sleeve, but barely seared his forearm. He fired as he moved back. Klein's eyes bulged with a wild, disbelieving glare. Suddenly he doubled over and pitched down on his face.

A terrific hubbub had arisen out on the ledge. As Strange raced toward the Brandenburg he saw a dozen Germans dashing back into the base. He reached the side of the plane. Brooks had shot the pilot. The man's body was dangling half-way out of the front cockpit. The G-2 agent was up on the monoplane wing, battling furiously with the gunner.

Strange vaulted to the wing. He crashed his gun to the side of the German's head and the man dropped. With a shout at Brooks, he sprang over into the front pit. Bullets were snarling past him as he snatched the throttle. The Mercedes gave a thunderous roar, and the Brandenburg lurched out toward the river.

The dead pilot's feet were almost in his lap. He gave the body a shove, and it tumbled over the side. The wind-screen before him cracked under a close-placed shot. He bent over, working the stick hastily to bring the plane on the step. The parabellum in the rear pit burst into a frenzied chatter. He saw half a dozen Germans wilt to the ground. Then a Spandau on the big plane spat out a smoking blast.

Strange had the seaplane skimming the water. He brought the stick back. A line of bullet-holes appeared out on the right wing. He jerked the plane up to a height of ten feet, nosed it down briefly. The tracers shot above the Brandenburg. He waited an instant, gained speed, zoomed sharply and banked to the left. Machine-guns were flaming from the shore, but they ceased as he plunged toward the great amphibian.

The huge ship was moving through the water, but the side of the control cabin still was open. He lanced toward it, his hand on the single stick-trigger. Von Munster's raging face appeared at the aperture. Strange clenched the trip—and the glass panel shot into place!

Bullet marks spattered across the glass, but the barrier held. A storm of lead smoked past the Brandenburg as Strange savagely climbed. One of the other escort planes was charging in at them. He turned, but the other ship reeled and burst into flames before he could center his guns. Bill Brooks gave a howl of triumph.

The big amphibian was racing up the Rhine, leaving a trail of foaming waves behind it. Strange nosed down for an attack he already knew would be futile. But a withering fusillade from the right drove him to hasty defense. The remaining escort plane came in furiously. Brooks loosed a fiery torrent, and the German sheered away. That brief turn was the last he ever knew. Strange half-rolled, caught him squarely in the Span-

dau sights. The escort plane pitched down with a dead man at the controls.

IT had seemingly been only a moment. But when Strange looked back, the amphibian was gone. Desperately, he dived over the river. He could see where the foaming track was dying out. He climbed again, but the death-ship had been swallowed up in the mists. And with a helpless despair, he knew where it was going.

"The first place we strike is this Yankee Third Corps" . . . those had been von Munster's words. Strange looked back at Brooks, then sent the Brandenburg streaking up into the gray.

A race against Death . . . and if they won they would lose. For he knew now there was only one way to stop that horror-ship . . .

The wind beat into his unsheltered eyes. He crouched back of the cracked wind-screen. If only they had a wireless . . . A hasty warning to the station at Grancy, and they could—but the Brandenburg had no wireless.

He stared at the German compass. If it were right, they were pointed straight for Grancy. Somewhere in the mists another ship was flying that same course . . .

The clock hands seemed to stand still. He kept the engine wide open. A German engine, pounding itself to pieces, perhaps to save thousands of German foes.

Minutes . . . minutes . . . now the clock hands were racing—but the ship seemed to be standing still. They must have crossed the Front, he knew. He caught the smell of hot metal, of oil with a taint of scorch. But they must be nearing Grancy . . .

The wind had freshened, for there were breaks in the drizzle, and once he saw blue sky above. More broken spots . . . now he could glimpse patches of ground. And then, abruptly, he saw the giant plane.

It was racing along in the edge of a cloud, half a mile to the South. Swiftly, surely, he climbed. He felt no surprise that they had found the death-ship. Something within him seemed to have known they would find it. This was his destiny . . .

At eight thousand feet, he leveled out from his climb. The great amphibian was flying parallel beneath them, slipping through the gray clouds, a flitting, evil shadow. It was but a few more miles to Grancy—a few more minutes until that frightful doom. He turned and closed the throttle.

"What are you doing?" Brooks cried. "There's no way we can stop them!"

A queer, hard smile came into Strange's face.

"Oh, my Lord!" moaned Brooks.

Under the make-up his face turned deathly pale. He stared down at that flitting shadow, then slowly reached out a trembling hand.

Strange gripped it tightly, and for an instant they saw into each other's eyes . . . It was like looking into a glass, seeing his own face there, with all hope gone.

Quickly, he turned and cut the switch. There was a hushed moment, then the nose went down and the seaplane screamed down the sky. His eyes were on that racing hulk, but they saw far beyond it . . . To the beautiful, dark eyes of lovely Karol von Marlow . . . to the grinning, impudent faces of Tom and Noisy Jay . . . to Jordan and General Thorne . . .

STRANGE fixed his eyes on the ship. Mustn't think of anything else . . . mustn't think of Karol . . . only that streaking hell-ship and the fiend who hurled it onward.

Dive! Dive! . . . Only seconds now! The huge wings seemed to whirl up at him. He saw guns tilt frenziedly. A terrified German threw his hands before his eyes. As the control cabin leaped into his sights, a grim smile twisted Strange's lips. German sights, guiding a German ship to crash down German killers.

The huge amphibian made a desperate twist. As it plunged aside he saw straight into the cabin. The face of Wolf von Munster looked up, ash-white with horror. Strange kicked sidewise to follow his frantic turn. Von Munster jerked the controls.

The death-ship lurched wildly—but too late. There came a grinding crash. The Brandenburg whipped over onto its back—and fell upside down into space!

Dazed, Strange clung to the stick, expecting nothing but a headlong plunge to the ground. But to his amazement the controls took hold as he moved them. He rolled into level flight, brought stick back. Hardly believing his senses, he saw the nose come up—shakily, but under control.

Then he knew what had happened. The long pontoons of the seaplane had hooked the big ship's cabin. They had shattered or torn off, and the impact had somersaulted the Brandenburg into clear air.

He looked up, searching for the German plane. Brooks gripped his shoulder, pointed off to the right. Strange turned. The crash had ripped the control cabin open and the giant ship was falling into a spin.

As he watched, a figure pitched from the cabin into space. A parachute blossomed above the man, slowed his fall, and Strange saw it was von Munster. A stream of white vapor geysered up from the broken cabin. It spread out in a shimmering cloud, slowly began to settle.

A second later, a terrific explosion shook the sky. The center of the detonation was the huge plane, but the battered wreckage was instantly lost in a mass of bluish smoke.

Five hundred feet above, the snow-like cloud was melting into a haze. And swinging down into that haze came Baron Wolf von Munster!

As he saw the hazy air beneath him, the baron wildly pulled the shrouds, trying to slip beyond it. The tilted chute dropped steeply. Strange saw von Munster's features, now a hideous mask of fear. A blue light suddenly glowed on that starkly terrified face. There was a quick, sharp explosion—and a headless

corpse swung down the sky.

STRANGE slowly turned, looked for a spot where he could land the Brandenburg. The pontoons were gone, but the mud on the bank of the Meuse would let the plane slide to a stop. A great thankfulness came over him as he glided toward the river. He had offered his life—and it had been spared. Brave Jack Conway had died to save them . . . but he and Brooks still lived.

The terrible Headless Death had taken its last victim. He gazed up, away from that gruesome figure slowly swinging to earth. The gray gloom was breaking, and high above he could see the blue sky.

It was good to be alive.

Zepplins Vanish!

(Continued from page 19)

was known that he had had some such idea previous to his sudden end.

Only John Scott and Drury Lang realized what that Griffon card meant.

But they had not expected the 55th Street affair. That went off in their faces and they were both still trying to figure it out.

"I can't believe it," John Scott argued for the tenth time.

"I bin expectin' it for months," Lang growled, "but I didn't figure he'd get it that way."

"Do you mean to sit there and try to tell me that you believe Kerry Keen was the Griffon?" demanded Scott with righteous indignation.

"What was he wearing when we found him?"

"A scarlet mask. But what of it?"

"What did this Griffon guy wear every time he appeared—a scarlet mask!" snarled Drury Lang.

"I know. But it don't make sense. The Griffon might have killed him and planted that mask," John Scott fumbled.

"The Griffon did that Staark guy in the night before, didn't he?"

"Sure—as far as we know. But you can't tie these two things up like that."

"I figure that this guy Staark had found out something about the Griffon—maybe about that airship, eh?"

"Say," gasped John Scott, grabbing a husky cigar and stuffing it in his face. "Wait a minute. You got something there, Lang!"

"Okay, chief. I get it like this: Maybe this Dutch guy, Staark, has something good in this new gas he has in mind. Maybe they are using it aboard the *San Diego*. Maybe it ain't gas for lifting or blowing up the bag. Maybe it's compressed gas for the engines. I read something about something like that once."

"Go on. Keep talking," snapped John Scott blowing a plume straight into Lang's face.

"All right. They know about this gas at Lakehurst, but they don't say nothing, see. They decide to try it out. Maybe it will give them a longer range—you know, stay up in the air longer. So just in case it don't work the way they

figure, they say nothing about the flight and just go. If it works, they'll radio back from Alaska, or maybe Hong Kong, or one of them places, and say: 'The stuff works. Here we are! Get it?'

"Keep talking!" growled Scott.

"All right, but someone else finds out that this stuff is the goods, get it? They blow in on old Staark that night and say: 'Look here, brother. You got something there and we want it—back in Germany. Come clean!'. But old Staark, says: 'Like hell, you can't rough me around. I'm an American citizen now and you can't do a thing about it or I'll call out the U. S. Navy. They gave me the run-around in Germany and I got out and got myself in okay with Uncle Sam. You clear out before I call a sentry.' So they gets rough and bop him off, and . . ."

" . . . and the Griffon sticks a card in his fingers, eh?" growled Scott.

"Maybe . . . Well, maybe the Griffon got the formula for the stuff and clears out, and when he gets home—to Keen's place on 55th Street—someone slips in and shoots Mister Kerry Keen, the dashing young man about town who was the Griffon all the time!"

"Bah!" snorted John Scott. "You should be writing Silly Symphonies for Walt Disney. What about that German plane they found?"

"All right, you talk!"

"Sure I will," shouted Scott. "I'll talk and I'll tell you something that will make you hair curl. Get this and keep it under your hat! *The San Diego really is missing!*"

"What?"

"She was actually stolen from the mooring mast at Lakehurst. Only a skeleton crew was aboard, and the rest who were on the ground have been rounded up and stuck away somewhere, where they can't talk. How do you like that?"

"Wow!"

"Add to that the fact that the German airship, *Brandenburg*, is also missing, as far as the German airship people are concerned. No one knows where she is."

"Whew!"

"I don't know why Staark was killed," continued Scott, "but if the Griffon did it, Staark's was a bad 'un!"

"Are you falling for that Griffon guy now—now that he's dead?"

"The Griffon isn't dead, Lang. Maybe Kerry Keen is—but the Griffon is still alive. Look!"

HE flipped a square sheet of paper across the desk. Lang picked it up and frowned. He stuck his dreary-looking tortoise-shell glasses on the end of his nose, peered over the top of the lenses, and read:

Check Heinrich von Braun. Have American Ambassador to Germany report on dirigible hangars in Black Forest. Brandenburg must not fly over city of New York.

The Griffon.

Lang read it over twice. "When did this arrive?" he asked suddenly.

"Early this morning—about seven o'clock. A taxi-driver delivered it down-

stairs. Said he had been paid to bring it by a man in a black hat, a dinner jacket, and patent leather shoes. He said he had left him at the 33rd Street subway station at 6:30."

"But Keen was killed about midnight," Lang argued. "He was also dressed in a black dinner coat and patent leather slippers. A black felt hat was on the table. The elevator operator said he was wearing one when he went up about eleven."

"Sure, but the Griffon sent me a message at 6:30."

"Was that Keen up there?"

"Looked like him, didn't it? The apartment officials identified him—but what makes me mad is that we have no finger-prints of Keen anywhere. None anywhere about the house, either."

"What about that driver guy of his. That Irishman, O'Dare, or something like that?"

"No trace of him anywhere."

Lang wagged his head, stared at the card again.

"Who's Heinrich von Braun?"

"He's another German dirigible expert. He was aboard the *Macon* when she went down on the West coast. They say his skill saved her from a bad crack-up. He disappeared after that because of some sort of a row with the Navy Department, and . . ."

. . . and Hugo Staark got his job, eh?"

"Right! Cripes, you're getting hot, Lang. That's exactly what did happen."

"And so Heinrich von Braun bopped off Mr. Staark. Well, that's one way to get your job back."

"No, you're wrong. Heinrich von Braun is dead! Committed suicide in Germany about six months ago."

"But this Griffon guy says for us to check on him. He must have something."

"Sure, and we think we got Kerry Keen on a slab down at the morgue—but maybe we ain't."

"Cable the Ambassador!" said Lang suddenly.

"Think I'm that crazy? The Ambassador would reply: 'Things are bad enough over here now without trying to dig up any more dirt.' And I wouldn't blame him. Dirigible hangars in the Black Forest—why there's about four million tourists rambling through the Black Forest every summer. They'd have a swell time trying to hide some dirigible hangars in there."

"I wonder how big the Black Forest is," said Lang with commendable curiosity. "Gimme that encyclopedia—that No. 3 volume."

He flipped the pages until he came to the subject he sought: "Say! Listen to this: 'The Black Forest covers a mountain range in south-west Germany. It has an area of about 1,800 square miles.' Golly, I never realized it was that big."

"Gosh, then the term 'Black Forest' actually means that the mountains there are covered with heavy timbered areas," gulped John Scott. "Gimme a cable form. We might as well try everything."

When he turned back, Lang was again staring at the Griffon note. "But what the hell does he mean by saying

that the *Brandenburg* must not fly over the city of New York?"

"That's what has me. How can we stop her?"

ALL that took place on Wednesday morning. Then at noon more startling news broke. The *Ludendorff*, an earlier edition of the new German airships, was reported missing, according to a news flash from Reuters' London office. This story had it that *Ludendorff* had taken off from the Lake Constance sheds after a complete engine overhaul with only a small test crew aboard. She had reported once over Frankfort—but from that time on she'd completely disappeared.

That left three massive dirigibles unaccounted for in the last 48 hours!

The Griffon's note was secretly forwarded to the United States War Department, but the only result it accomplished was a cryptic answer which read: "Very interesting, but where is the *Brandenburg*?" That left John Scott and Drury Lang further up the pole than ever. They both swore, lit bigger and blacker cigars, and waited for word from the American Ambassador in Berlin.

Meanwhile at Graylands, Kerry Keen's Long Island estate, two men huddled over the short-wave radio set in Keen's library. They had been at it for what seemed hours. They had scrawled down message after message picked up on a certain wave-length. But in spite of every known decoding device they could make little out of it.

"It all keeps going back to one word, Barney," Kerry Keen said, his eyes haggard and tired. "It keeps coding out only this word 'Miquelon'. For the life of me, I can't figure out what it means."

"Miquelon? . . . Miquelon?" the deep lipped Barney muttered. "Miquelon . . . we've had that word . . . a name somewhere. We've been to a place named Miquelon . . ."

He grabbed the bottle of O'Doul's Dew again, poured himself another snort of Highland nectar. "Miquelon!" he gagged, smacking his lips.

"California? . . . No. Would it be along the Texas border?" muttered Keen, fingering his pencil again.

"I got it! I got it!" Barney bellowed now. "Remember when we went up to Canada . . . Newfoundland? That little island off the southern coast. It belongs to the French, I think."

"Miquelon! Right! Right, Barney!" beamed Keen. "A small French fishing station ten miles off the southern coast of Newfoundland. Whew! . . . Perfect! I remember the place now—only a few hundred people on the whole island which has an area of more than eighty miles. Perfect, Barney, perfect! Pour yourself another drink."

He snatched at a chart, made a hurried calculation.

"About 900 miles . . . about five hours flying time," Keen said. "If we leave here at 9:30 or 10:00 tonight, we can make Miquelon by 3 o'clock."

"Who can?" demanded Barney.

"We can—you and I!" Keen explained. "Besides, we can't sit about

here doing nothing. I'm supposed to be dead. They'll be coming out here soon to make a search, once they find out that the guy they found in my apartment was not me, but . . ."

"Well, who was he, anyway?" demanded Barney, putting his bottle down.

"His real name, I believe, was Franz Bleccer. They evidently selected him to do his stuff because he looked startlingly like me. Same height, same color hair, and not unlike me as to profile. In clothing like mine he could have passed for me anywhere."

"And did," added Barney.

"Apparently. That's why I became suspicious about the *San Diego* business," Keen went on, making up a chart for an air trip to Miquelon. "Had I not run across Commander Grosset when I was making that inquiry concerning helium gas down at Lakehurst, I would never have learned about Franz Bleccer. You see, this Bleccer chap had appeared two days before and had asked permission to make a trip aboard the *San Diego* in my name. Grosset was unable to give him permission, owing to the fact that the *San Diego* was going on a secret test flight and no civilians were to be taken aboard. Then when I went down a few days ago and inquired about the helium, Commander Grosset was under the impression that I was still putting in a bid for a flight, and he reminded me that his refusal was final."

"That must have been funny," said Barney.

"At first, I thought he was kidding me about something—and then got the whole story. Grosset realized at once that something was up and advised me to watch out. But it was not until last night that we spotted him entering our apartment. I didn't intend to kill him, but he was dangerous. And when I realized what a startling resemblance he had to me, I decided that I'd let them think he had bumped *me* off. And, here we are."

"And here we go—Miquelon, next stop! I wonder if that little Fisherman's Inn is still open on that island—the one near the wharf."

"It won't matter, Barney. This is a business trip. And if I know anything about Miquelon, you'll never see that wharf. We'll be miles inland looking for a postage stamp to land on."

"Oh, that's it. Then I'd better go below, eh? You'll be wantin' all the juice you can carry. Right?"

"And all the ammunition, too, Barney. This will be a beaut, if I'm any judge."

And with that the two parted. Barney went downstairs to the underground hangar and Kerry Keen, whose face was now gracing the front pages of most newspapers in the country, went to bed. He needed all the rest he could get—for he sensed they were in for a tall evening.

AS soon as it was reasonably safe to make a move, Keen and O'Dare drew their Black Bullet amphibian out of the underground hangar and ran it into the clear between the sheltering foliage of the grape arbor.

The big 1,000 h.p. Avia motor was ticking over gently, muffled beautifully by the Skoda silencers. Barney clicked the switch that drew the camouflaged hangar doors back. To the casual eye, they now presented nothing more than a colorless, country estate rock garden.

Both men were dressed in black coveralls and wore black parachute equipment. In addition, each was heavily armed with a brace of automatics. The cockpits of the Black Bullet had been stuffed with full equipment necessary for the long flight ahead of them. Nothing had been left unchecked.

Barney swung the wings out and locked the king-pins. Then almost silently they rolled down the slipway toward the hard packed sands of the shore, dropped quietly into the water, and eased clear.

Keen took the controls, and with the big Avia purring gently, they headed well off shore before opening up and climbing into the star-flecked sky. With altitude gained, they swept off to the north like a wicked black projectile. Keen, peering at his compass course card, kept the ship on her line—for Miquelon.

They cleared the tip of Cape Cod and headed for Cape Sable on the southern end of Nova Scotia. They flew on for hours with Keen and Barney taking turns at the controls, but they gave as much attention to their radio receiver as they did to their throttle and compass. Hour after hour went on, with one intent on the compass card, the other on the radio.

"I don't know where we're going, Barney," Keen finally muttered, "but something tells me we can make an awful mess of this if things don't work out with half a break on our side."

"Half a break, half a break, half a break onward," paraphrased Barney. "Into the Fisherman's Inn, crashed Pulski and Ginsberg!"

"There'll be no Fisherman's Inn, warned Keen.

"Then it's gonner be an awful dry show!" moaned the Celt. "But say, we're dead over the Strait of Canso now. Cape Breton Island ahead."

"I thought so. And look down there! Over to the right!"

"Yep, another Junkers," snapped Barney. "What the devil!"

"Do you get the connection?" cracked Keen.

"Sure . . . Canso . . . the cable station."

"Right! He's going to try to smash it!" growled Keen. "I knew there was something big about all this. Well, do your stuff, Barney! And make it fast! I want to make them talk, if possible."

Below them lay the small buildings of the Western Union cable station where the all-important trans-oceanic cables connecting the North American continent with Europe were anchored. It was evident that the sleek, silver Junkers was heading for the series of buildings that housed the valuable instruments, cable terminal connections, and other complicated apparatus of a trans-oceanic cable station.

They watched the Junkers curl

around carefully and shoot for the wind to steady herself and to give her gunners and bomb-release men their steadiest platforms. Barney held his time until the absolute last second, then he whipped up, rolled over, and went down like a bat out of Hades. The Black Bullet raced at the silver Junkers with two gun flaming. Barney was "on" tonight. His first burst smashed into the starboard engine of the Junkers and battered the steel prop to stubby arms which swung aimlessly. His second slashed through the metal cabin with a wild whip-like lashing. The Junkers seemed to constrict under the lacing; it whipped up hard. A few black bombs now spurted down from her cabin racks. But they missed the station by many yards. Barney wheeling hard, swerved back fast, and poured a broadside into the bandit ship.

Behind, Keen sat listening intently to his radio set. He did not put his hand to a weapon, but held his fingers lightly on the wave-length lever of the Marconi outfit. As Barney ripped in a second broadside, Keen stiffened. His eyes stared at the cross-webbing of Barney's pack chute harness and his ears strained to get what was coming over the air.

The men in the Junkers had now thrown all caution to the winds. They had been cruelly betrayed, waylaid. Death faced them.

Keen then caught the words:

. . . it must be the same machine that got Strauben . . . a black monoplane that might be an amphibian. Tell Furst at Miquelon to get away fast and pick up the others over the Great Circle . . . Gott! . . . we're in flames! . . . Good-bye, Schlecken . . .

The words ended with a scream which in turn was drowned out by an ear-splitting explosion. Keen peered forward and saw the Junkers disintegrate amid a splatter of flame, sparks, smoke and twisted dural. The debris swept out across the sky in a crazy design, hung there for what seemed seconds, then fell away, a wild flame-embroidered curtain, that dipped tassels of death into the sea.

BARNEY whipped his machine out, cleared a shower of splintered wreckage, and wheeled clear. He turned and grinned at Keen.

"Well, they won't bother the Canso station any more, eh?" said the Mick. "How'm I doin'?"

"You did pretty good. You banged a message out of those guys that was worth all the cable stations on the East coast!"

Keen jotted down some notes, then moved up front and let Barney take a rest. They were not molested further and by the time the first faint tinge of dawn began to draw a dusty line across the eastern horizon, they had shut off the Avia and were gliding in toward Miquelon Island.

They swerved to the east once, circled, then cut back across the little nub of ground below. They studied it closely with their night glasses but could find very little that gave them any indication of the island's secret.

"We're wasting time," Keen growled. "Let's get down and see what we can do there. I'm getting fed up with working at 6,000 feet."

"Well, it's a little early for the Fisherman's Inn," argued Barney.

"Forget the Fisherman's Inn," snapped Keen. "Sit steady, I'm going down to that spit of land to the right."

"Which reminds me, I'm so dry I couldn't spit," Barney joggled.

"Bum joke! Sit tight and keep your eyes open."

Keen put the purring Black Bullet down on the water and eased it up to the sand. His chart was true and he found his wheels taking hold once the pontoons were clear of the water. He waited a moment or two, then eased the machine up across the hard packed sands and let Barney slip out and fold her wings back. In this way it was no trouble to run the black amphibian up well out of sight amid the heavy vine foliage that interlaced between the stubby, weather-beaten trees.

Carefully, they checked everything again, then made themselves comfortable at a light breakfast from their small hamper of food.

Keen lay back, pondered on their strange situation, and tried to figure its solution.

He was more certain than ever that Miquelon held the secret of the *San Diego*, but so far they had been unable to fathom any of it. If the *San Diego* was up here, how had they managed to bring it safely to earth? That meant, for one thing, a full and skilled ground crew, and since Miquelon was a French possession, it was not likely that anyone connected with the island would assist such a mad intrigue.

Then there was that Great Circle business.

All liners took the Great Circle route during the summer months and the new German passenger airship, *Brandenburg*, had been using it extensively. Someone aboard the Junkers bomber had advised a man named Schlecken to advise another man named Furst to get away from Miquelon and join the others over the Great Circle. That was it. He had said "over" the Great Circle, not "on" the Great Circle. They must have meant that "the others" were flying—and the only thing capable of flying the Atlantic with any degree of studied planning were the German dirigibles!

Keen racked his brain.

He knew the *Brandenburg* and the *Ludendorff* were missing—as far as the German officials were concerned. In addition, the American Navy dirigible, *San Diego*, was nowhere to be found. Now, if the *San Diego* were here at Miquelon, it was more than likely that the operator aboard that Junkers bomber referred to her when he said, "Tell Furst at Miquelon to get away fast and pick up the others over the Great Circle! There was no question but that all three intended to rendezvous somewhere off the east coast, and . . .

"And what?" Keen asked himself, pausing.

Why would three dirigibles converge

on one point, surreptitiously? Certainly they were not coming for a routine commercial trip. All the evidence pointed to something menacing. Why had that Junkers attempted to destroy the cable station? Only to prevent messages from going across the ocean. Of course, radio could be employed if a real emergency arose, but who could tell how far they had gone along that line? There would be a delay if the cable stations were put out of operation. Only a short one. But in a case of this kind, things would no doubt happen fast, and a short delay was probably all they desired.

"I think the *Brandenburg* and the *Ludendorff* are up to no good," Keen said aloud. "I think they plan to meet the *San Diego* somewhere out at sea late today, so that they'll reach New York City late tonight. What's your opinion, Barney?"

But there was no Barney anywhere near.

Keen sat up, caught the outline of the Irishman's footsteps in the sand. He had slipped away while Keen lay back with his eyes closed.

Keen kicked sand over the smouldering fire, slipped out of his coveralls, and smiled grimly.

"I guess he was really sincere about the Fisherman's Inn!"

DAWN was just breaking when Kerry Keen wandered in past the stringy lines of drying nets near the island village. There were several small fishing boats drawn up clear of the tide and somewhere off in the distance a moaning buoy wailed as it swung from its chain.

Keen now remembered the quaint little community. Both he and Barney had once cruised in these waters. Off to his left, standing on stilt-like piles, a line of weather-beaten cottages and shacks rested wearily against each other. A dog barked. Keen tramped past lobster traps, decayed boats, and swirls of crusted seaweed, then finally spotted a dull gleam of a light ahead.

He smiled. He realized that Barney had aroused the inn-keeper with his demands for liquid sustenance. He hadn't realized how near to the old village they had landed.

The Fisherman's Inn was a frowning, low-eaved affair built on an elevated mound of earth and rock. One portion of the structure was given over to the alleged comforts of a tavern. The remainder, dotted with small windows, was apparently divided up into small lodging rooms.

Keen made his way along a boarded walk that led up to the heavy timbered doorway. He went in and found Barney in jovial conversation with the bar keeper. The man had evidently been rudely aroused from his bed.

His face was still creased with sleep, but he was accomodating in spite of the hour.

Barney swung around when Keen walked in, and holding up a dingy goblet that glinted with a liquor of some description.

"Just in time for a cup, boss," Barney brayed.

"You half-wit, slipping off like that!" Keen frowned. "Give me a milk punch, landlord," he added with a sly grin.

"You gentlemen stopped here some years ago, I remember," the former sea-dog opened, once he caught the drift of the conversation.

"Once," said Keen, not any too anxious to completely identify himself. "We have a schooner on the other side of the island, and we have been tramping across as a change from the vessel." Then he added under his breath to Barney: "I hope that jibes with anything you said, you mutt!"

"All I did was holler for him to open up," Barney replied while the man measured out a jigger of St. Pierre rum.

"Good! Now I'll do the talking. Why didn't you tell me you were heading this way?"

"You looked too quiet and peaceful, laying back there thinking," Barney muttered under his breath.

"Many visitors on the island this year, Pierre?" Keen asked.

"A few. But we do not see many things of interest—except the airships." Both Barney and Keen tensed.

"Airships? What airships?" Keen asked, trying to be casual.

"The German airships. They are flying across every week now," added the French innkeeper putting Keen's punch before him.

"Oh, *those* airships. You mean they fly near and you see them inbound and outbound?"

They pass very close to Miquelon when they take the northern route. We see them often."

"Of course. When did you see them last?"

"One went directly over two nights ago," Pierre said with unconcern, as he poured himself a noggin of rum.

"Two nights ago?" Keen questioned suddenly. "You must have made a mistake. Was it a German airship?"

"Ah, yes. A German airship. You think I do not know the German . . . what you call emblem . . . swastika. It was very plain on the stern . . . on the rudders."

BOTH Keen and Barney went back to their drinks, but they exchanged glances in the dirty mirror over the bar. They both were certain that neither of the German airships *could* have been over Miquelon at that time—and yet this unimaginative French innkeeper had said he had seen the markings on the rudder.

"You're sure it was not the American dirigible, the Naval airship *San Diego*?" Keen asked after a minute.

"Would the *San Diego*, what you say have the German swastika on it? If not, it was not the *San Diego*, my friend. I saw it with my own eyes. It was a German emblem."

Pierre spat defiantly. He was a true Frenchman.

"Well that about snubs it," said Keen to Barney out of the side of his mouth. "If what he says is true, we're both nuts."

"Wuz that airship going back, or com-

ing in, Pierre?" Barney asked to switch the conversation.

"I do not know. He was not going, and he was not coming—he was standing still, up above. Then he went off toward the west. I went to bed. It was late to be up, anyway. Besides, have I not seen it already many times?"

Again Barney and Keen exchanged glances.

"Suppose, for instance," Keen broke in, "that one of those airships got into trouble. Suppose it made a landing on Miquelon, Pierre. What would happen?"

"I do not know, my friend. Pierre, you remember, is French—and the airship is Boche. People of Miquelon are French, and the airship is Boche. I have no love for the Boche. My three sons were fishermen here until 1914. They are dead now . . . the Boche . . ."

"I'm very sorry, Pierre. I was just trying to figure something out. Do you think there is any place on Miquelon where an airship could be landed successfully and hidden away for a few days?"

"You think the airship I saw the other night is on Miquelon?" Pierre hissed, gripping his glass until his great hand threatened to crush it. "What for on Miquelon?"

"Do you think they could?" persisted Keen.

"On Miquelon? We are but a few miles wide, five at the most and less than twenty miles long. Very little vegetation and . . . well, there are many rocky places off Platte Point a couple of miles north of here. They might. . . I would not know how big is this airship you talk of. Some say as big as the *Normandie*, but of course I laugh at that.

"Well, not quite that big but almost," said Keen reflectively. "You have not seen any strange characters about here you? I mean men who might have arrived here recently?"

"Only you . . . and the Coast Guardsmen who put in here regularly . . . from the ice patrol, you know."

"Oh, U. S. Coastguardsmen?" asked Barney.

"Well, they wear U. S. Navy uniforms. They don't come in here much. Their officers are pretty strict with them, and they're still on duty in these waters, you know."

"How many of these Coastguardsmen have you seen in the past—let's say, the past week?"

"I saw about a dozen or so yesterday. They were on the road . . . *Mon Dieu*. They were on the road that leads from the Devil's Drydock . . ."

"The Devil's Drydock? What's that?"

"It is a rocky depression about four miles north of here. It is all whitish granite. It looks like a dockyard . . . or more like a dry-dock. It has been there for ages, I suppose. Once, the French and the English fought in there—in 1803, I believe. Inside it is very level and very hot in the summer because no wind or breeze gets in."

"That sounds like it," muttered Barney.

"You are a good Frenchman, eh, Pierre?" Keen said with a smile.

"I'm a good Frenchman. sir. A very good Frenchman!"

"Then if you still are none too friendly with the Boche, as you call him, you will forget you ever saw us. You never spoke to anyone about the Devil's Drydock, and you'll mix up another round, eh?"

"*Bien*," beamed the French innkeeper. "It shall be so." and he swished his tattered cap, collected the glasses, and started to mix another round.

In payment, Keen rewarded the innkeeper with sufficient to purchase several demijohns of St. Pierre rum. Several? . . . Well, he handed him a crisp one hundred dollar bill.

"Thank you, sir," Pierre said again, bowing profusely.

"Thank you, Pierre," Keen said.

But before either Keen or Barney could raise their re-filled glasses, the door crashed open and a man staggered inside.

"*Mon Dieu!*" gasped Pierre.

Barney gulped.

But Keen leaped forward and caught the newcomer just as he sank to his knees.

THE man was in an undershirt and a pair of dirty pants. His bare feet were dirty and bleeding. His wrists were raw as though they had been cruelly bound with harsh thongs. It was evident he had escaped from somewhere.

Keen dragged him across the floor, laid him carefully on a table. Barney rammed Keen's milk punch at his lips, made him drink. The man stirred.

"What happened?" Keen asked. "Where did you come from?"

Then he caught the stenciled name and number on the man's waistband. They were U. S. Navy pants!

"I . . . I got away!" the man husked. "Got away."

"Where from?"

"Up . . . up there in the rocks."

"Are you a coastguardsman?"

"No . . . Naval Aviation . . . I was on board the *San Diego*. They got her up there in the hills. A crazy mob with a guy named—"

"A man named Furst?" broke in Keen.

"How . . . how did you know?" demanded the man, trying to get up on his elbow. "How the hell . . . Sorry, I guess, you must be an American, eh?"

"We're both Americans," soothed Keen. "Tell us about it—fast. You say they've got the *San Diego* hidden away up there?"

"Yeh. Furst, you know, was a technical expert on Maybachs . . . the engines. We were at the mast on a night mooring detail with only a skeleton crew aboard. Then suddenly we were overrun with guys who came up out of nowhere and were all tied up along the catwalk. They threatened to throw us over board if we tried anything funny. Then they took off and brought us up here."

"But she had German markings, when she arrived up here. Pierre saw her and thought she was a German Zep."

"Yeh. Don't ask me how they did it, but they did. This guy Furst knows his

Zeps! They landed her on the water—landed her so she just floated—and they put guys over on special steeple-jack rigs, lowered them from the upper girders, and they painted out the Navy markings and pasted German markings over them. That's all I know."

"That's plenty! Now where's the rest of the Navy men?"

"Tied up in a cave off on one side of that big place up there."

"But how did you get out?"

"I cleared my hands somehow. Then I went down a long part of the cave, found a stream, and followed it. I found that it came out on the other side of the hill. I had to swim out and it was pretty low in spots."

"Say, you certainly took a chance!" gaged Barney.

"You mean you came out of a subterranean stream—through the rock?" asked Keen.

"Yeh. I swam out . . . nearly a quarter of a mile, I guess. But I got out. Boy, I'm bushed!"

"Where is this stream? I mean where does it come out?" Keen continued.

"Where? Well, it's up the road that runs down to here about four or five miles. It comes out of an almost square opening, runs across a scrubby field to the road, and then it runs under a culvert, I think. You can't miss it. There's three scraggy pine trees on one side standing together all alone to mark the place."

"Swell! If you got out, we should be able to get back in."

"Sure—if you don't like life. You see, there are sentries in there. They ain't taking any chances. The rest of the mob will be asleep because they're clearing out tonight and they'll need rest."

"We'll take care of the sentries. But do you know where they're going?"

"No, not for sure. But they loaded the *San Diego* with bombs, and I ain't never seen bombs in them racks before."

"Do you know that the *Brandenburg* and the *Ludendorff* are missing from their German hangars?"

"Good Lord, no!"

"Well they are and the *San Diego* is supposed to meet them somewhere over the Great Circle—probably tonight," explained Keen.

"Cripes! Then they . . . all three of 'em are going to bomb something, eh?"

"That's what we figure. Hear anything up there that would give us an idea?"

THE man lay back, weary and worn. He closed his eyes and tried to think, but his body writhed in pain. Barney and Pierre were busy getting him warm milk and wrapping him up in warm blankets. Keen still pursued his topic.

"Look here," he jerked, rousing the Navy man again. "You've got to think. It's terribly important. They may be heading for New York."

"That's it . . . That's it!" the Navy man suddenly gulped out. "I remember now. They said they wanted to be sure that the Mitchel Field squadrons were 'taken care of' before they started."

"They realized that those outfits were

the only tough ones anywhere near New York that might be able to intercept them. Yes, they are heading for New York!"

"So what? Can we wire through to stop them?"

"We can, but *can* they stop them?" asked Keen. "You're an airship man. You should know."

"I don't think they could stop the *San Diego* if we got a break in the weather. And there's no pursuit outfits at Mitchel now. They're all heavy bombers and observation crates."

"But, suppose we sent the *San Diego* out to meet these two German ships and they received her still believing she was with them? Couldn't the gunners aboard the *San Diego* stop them by surprise methods?"

"I'd like the chance—but how are you gonner do it? Say, who are you two guys, anyway?"

"A fair question. We're Pulski and Ginsberg," smiled Keen. "Just a couple of globe-trotters trying to get along."

"Pulski and Ginsberg?" frowned the Navy man. "You don't look like guys with names like that."

"Ask Pierre here. He has known us for years."

Pierre folded his hands across his belly and nodded.

"Okay. Now what's your idea?" the Navy man said faintly.

"How many Navy men are tied up over there?" asked Keen.

"Twenty-four—twenty-three with me out."

"Can they handle that ship and fly her out to contact the two German airships?"

"Sure. That's one watch. They'll have to stay awake longer, that's all. But they can fly her."

"Swell! Then if Pulski and I get in there and release them so that they can overcome the German mob they can get her out of there and make the contact?"

"Sure. There's some swell guys up there. Smart guys, too."

"All right. You're sure the German mob will be asleep?"

"Yes—except the sentries. I heard them say that. But where do I come in?"

"You're resting here until tonight. Then you can go back and join the Navy men. I'll see that they wait for you. Here take another swig of this rum and milk and then cork off for a few hours."

"You won't let me down, will you . . . ?"

"The name's Ginsberg," Keen replied, "and neither I nor Pulski will let you down, so get in a good nap."

Then Keen and Barney slipped away, after giving Pierre orders to take care of the Navy man whose name they had not even bothered to learn.

"I hope you can swim," said Keen with a grin, as they hurried along.

"I hope you can shoot!"

"We'll have to, I'm afraid."

Together they cut through the furze and scraggy trees and made their way to the side of their black amphibian. There they changed back into their black coveralls and masks and buckled on their guns. They took extra knives, flashlights, and short sections of stout

cord.

They agreed on certain signals, then started through the rest of the furze checking their time and direction. They came to the straggling gash that went for a road on Miquelon and using extreme care they kept under cover until they reached the three pine trees described by the Navy man.

Finally they found the square opening in the rock out of which streamed the snaky black river—and splashed in.

KEEN led the way with his flashlight focussed down to a mere pencil of light. From the start they checked their steps as they plunged through the swirling waters in order to get some idea of the distance they covered.

"Strike me blue, but it's cold," Barney growled.

"Good thing you were 'fortified' back there at Pierre's, eh?"

"An' you were against me goin' weren't you?"

"I didn't like the idea at all. I expected we'd run into some of this airship mob. I wonder what they do up here."

"Sleep and eat, I suppose."

"I hope they're sleeping now."

Barney slipped over a greasy stone and the conversation ceased as they picked their way carefully through the water. It became deeper as they trudged off the yards, and finally it was far easier to swim than to risk the treacherous footing. It was colder as they advanced, and they had to cling to the dank walls now and then to get their breath and prepare for the next splashing rush.

"We ought to be gettin' there soon," Barney protested, shoving his mask high on his head. "I thought we were supposed to be bold, intrepid knights of the sky. Here we are scrambling through puddles like a couple of otters."

"This is nothing. You wait until tonight. You'll get all the bold, bad knight of the sky stuff you want," growled Keen. "Come on!"

They plunged on again. Soon they sensed that the stream was becoming shallow once more. In a few yards they were able to stagger on with the water up to their knees. Suddenly Barney let out a warning. Keen stopped and felt for his gun.

He could see Barney standing with his hands on a shelf of rock that lipped out over the stream. He raised himself gently, looked about with his small flash.

"This is it," he whispered. "Look, there's the footprint of that Navy guy. He had no shoes on, remember."

"Right! Go ahead."

They crawled along carefully, then doused their lights; for ahead of them they caught the low glow of diffused daylight. They let the water run out of their clothing, checked their equipment again, then drew their close-fitting waterproof masks down.

"I do all the talking, remember," Keen snapped.

"An I do all the fightin'; I suppose," Barney muttered. "Okay Ginsberg."

They crept on and finally caught the

dim outline of a blackish cave. The ceiling was high. It gleamed with wet inverted spires of stone. They halted and allowed their eyes to become accustomed to the change in light. Then they saw what they had come for!

"There's the Zep—out there through that gash in the doorway."

"See that sentry there?" Keen whispered. "He's all yours. Get it?"

"I knew all the fightin' was for me."

"Get him cold and without a sound when I give you the signal."

"Okay! let's go."

They crept along and saw the men of the imprisoned skeleton crew sitting and lying about in small groups. Keen dropped to his stomach and began crawling. Barney was near him as they approached the first group.

Keen threw a light pebble first and got a growl from one of the prisoners. That is, he started to growl, but caught himself just in time. He saw Keen's hand held up and he nudged the rest around him.

They eased in on their stomachs and called: "Keep quiet. Are you bound?"

"Sure . . . our hands. Who the hell . . . ?"

Keen slithered around and cut the first man's bonds. Then he rammed a gun in his back and snapped: "Now get this, sailor. We're helping you get out, but no questions and no monkey business. We're giving the orders and we don't want our names in the papers. Get it?"

"Sure. Cut these guys loose. We'll show you."

"Okay. But wait until Pulski—my companion's name—gets that sentry."

"I get it. They just changed the guard, so we get a break, eh?"

"Here take this knife. Cut the rest of these guys loose, but tell each one to obey me. Where's your officers?"

"Look! Over there. Each one is tied up to a post so that they can't talk to anyone."

"Right. I'll get them out," said Keen.

THERE was a short scuffle near the opening of the cave. They saw Barney ram a gun into the sentry's stomach with his right hand and then almost take his head off with a short curling left hook. Barney then caught the man carefully and grabbed his rifle before it fell.

A barefoot sailor rushed up, took the rifle, ammunition belt, and the man's hat and took over his post as though nothing had happened. Barney tied the man up, gagged him securely, and gave his Colt to a young Petty Officer.

In ten minutes they had completely consolidated their position. Three men of the pirate group who came in had been quickly overcome. Keen, still wearing his mask, held a hurried council of war with the four officers.

"All right," he said. "You guys play the game, and we'll give you a chance to get back."

They all nodded and fondled the guns in their palms.

"My name is Ginsberg and my mate here is Pulski. We ran into your man down in the village and got the drift

of what is going on. Now you know what these guys are up to, and you've got to play this game right or New York will be in ruins by early morning."

The four nodded.

"Now you say the rest of these swine are sleeping. We probably have nailed most of the guards. What we have to do now is to overcome the rest—either tie them up here or take them aboard the *San Diego* as hostages."

"We're taking them along. They can take the same chances as us, the rats!" a young Lieutenant snapped.

"Okay! After that you must find out the call letters and code they were using, and contact the *Brandenburg* and the *Ludendorff*."

"I got that. I saw the book they were using. I'll contact 'em, all right!"

"Fine. Who's gunnery officer here?"

"I am," said one. "And believe me you'll see a fight. The first time in the history of the world that dirigibles engage in aerial combat! We'll give those guys the surprise of their lives."

"Fine. Now for the raid on the rest of them. Where are they?"

"A few are quartered aboard. The rest are in tents. Most of them are asleep."

"All right. Organize the men into two groups. Distribute the guns available, and clean up the job."

"Wait a minute," a heavy man broke in. "We do all this, contact these other ships, destroy them, return to Lakehurst, and get all the plums—if we get away with it. But where do you come in?"

"We don't—that is, we just fade out of the picture; and if anyone asks you about all this, just say that a couple of guys named Pulski and Ginsberg helped you out."

"That doesn't make sense," spoke another.

"Your job is to regain control of your vessel, isn't it?" Keen argued. "After that, you are supposed to defend your country. A couple of guys like us don't count in a thing as big as this. Of course, you may need a little help later on, taking on two Zeppelins. Perhaps we can do something. But don't worry about us, we're just a couple of guys having a good time. The rum and milk at Pierre's is very good, you know, and we'll always be able to hear about what happened later."

"Why don't you come along with us. We could use you," the heavy man said. "We'll see that your identity is kept secret."

"Nothing doing. We don't like flying; we get airsick," Keen replied, his eyes shining through the slits of his mask. "You carry on, and we'll see that you get home Okay. And one more thing. We could use some petrol . . . er, gasoline. We're a little low and if you could leave us a hundred gallons or so, we'd be glad to drop by later on and pick it up."

"Where you anchored?"

"Oh, off shore a mile or so down the beach."

"You'll get all you want. We'll leave it in here. How's that?"

"Fine. Now get going!"

THE clean-up of the mob in the Devil's Drydock was something that will go down in Naval history. It was a combination Donnybrook, bar-brawl, and boarding action all rolled into one.

Even Barney took time out once to stand off and watch those Navy men "work." They were upon their victims before the mob could figure out what had exploded in their faces. The enemy crew went down like ninepins under the battering of husky Navy fists. One or two tried to shoot it out but were nailed cold. The Navy men climbed into the *San Diego* before the outlaws aboard could make a move to cast off.

The big dirigible had been landed with the aid of a special crew manning two light winches and she was now held down by cables that were anchored to heavy rocks. The Navy guys went up those cables like monkeys and nailed sleeping engineers, radio men, and mere guards from every available point on the ship. It took less than ten minutes to complete the job and take over full control.

The bandit crew, dressed in motley garments composed of U. S. Navy stuff, mercantile marine dress, and common overalls, were soon lined up. They were marched aboard as prisoners and carefully "ironed-up" along the main girder.

Alert guards took charge of them.

"Now remember," Keen warned. "You can't advise your base that you are Okay. You've got to play your part now and tag those two Zeps. If you try to advise Lakehurst that you are on your way back, those babies out there somewhere over the Atlantic may intercept the message and sheer off. And you can't take chances like that."

"I get it," the young Lieutenant-Commander in charge said. "What time should we push off from here?"

"That will all depend on what time you are due to contact the others."

"Well, let's see what Gregory says. He's down in the radio compartment. Perhaps he's figured it out by now."

They hurried along the catwalk, then descended the gleaming companionway to the control car. There they came upon the control crew gloating over a small chart.

"Perfect! The whole thing's lined up swell for us! Look, they're to meet over this point here. They must have made this map up this morning."

Keen studied it carefully, then frowned.

"That's bad," he said. "They are to rendezvous twenty-five miles due east of Montauk Light on the dot of midnight. It's too close to New York to be safe."

"You're right," the commander said. "That's too close to be funny. It means we have to contact them, and then in the space of time it takes to cover about fifty miles, we have to stop those two Zeps. Not so good, if we get pinged and slowed up."

"And not only that," Keen reminded. "That point is about 900 miles from here. What can you do with this craft with the load you have?"

"About seventy. That's an average, of

course. She'll do more, but we can't keep it up for any length of time."

"Seventy! Then you'll be all of thirteen hours making that point. Say! You'd better be moving; it's almost noon now."

"Get everyone aboard. You won't come then?"

"Not us," said Keen. "But we'll be seeing you one of these days—at Lakehurst. And say," he said to change the subject, "can you arrange to pick up that guy at the village?"

"Sure thing! We'll drop him a loop and pull him aboard. You take these axes and cut us clear. Understand."

"I get it. Now get going!"

The weighing-off call was sounded and the air gobs scampered to their posts. Keen and Barney, ducking the drenching ballast spume, ran along the floor of the Devil's Drydock and chopped away at the heavy manila guys.

One by one they were severed with a twang, and the big ship lurched to free herself. Then finally they slashed the last and the big silver bag bearing the fake insignia arose clear of the natural bowl and steadied herself as the propellers bit in and guided her clear into the wind.

"So long, and the best of luck," Keen yelled up to the men in the control car.

"So long, Ginsberg! So long, Pulski! And thanks for the assistance!"

And with that the *San Diego* cleared the granite walls that had sheltered her and headed slowly for the little fishing village less than four miles away. Barney and Keen watched her with no little regret. They knew down in their hearts that the *San Diego* stood little chance of stopping one, let alone two German dirigibles.

"Well, what now?" said Barney.

"You know what now, you faker," Keen grinned. "We have to hump it back, get the Bullet out of her nest, put her in here, and load up with gasoline. By the way, there's really some here?"

"Sure. It's good stuff, too. They must have used it for the Junkers ships. It's over in this cave."

"Great! Let's get going back."

"Yeh. Back to the Fisherman's Inn first. I want to make sure they took that guy off," Barney said with rare seriousness.

"Don't worry, Pulski," said Keen, seeing through the gag. "There's plenty of that stuff left and we don't have to get out of here until about seven o'clock. We'll catch up with them somewhere off Cape Cod."

BUT while they were not due to leave until 7 o'clock that night both Keen and Barney knew they had plenty of work ahead of them before they could get off. For one thing, there were several bodies to be buried and a general inspection of the Devil's Drydock before they could get away. They checked everything; and Keen scribbled a few notes to add to his report, which he hoped to slip into John Scott's safe with little or no trouble—just to keep the record clean.

Then they had to get back to the Black Bullet via the overland route this

time. They divested themselves of their still-wet coveralls and masks, climbed the steep rock wall, then slowly made their way down the hills, basking in the sunshine which completed the general drying-out process.

Back at the beach they went over the amphibian, checked her carefully, then took off. Keen handled her. He swung out to sea for a distance, then returned by another route, and finally dropped down to a landing inside the great natural bowl.

They ran her into one of the open caves and went to work refuelling. They took on plenty of gas—for they realized they faced another long flight, a flight that had to be made and completed.

Keen checked the guns, then found a few light fragmentation bombs that could be fitted to his own machine. They finally stowed their tools away, then made themselves comfortable in the sunshine.

By late afternoon, both were rested and refreshed, and then Barney volunteered to walk back to the village and get some grub—and beverages. Keen smiled, but allowed him to go. Barney returned shortly after 6 o'clock loaded down.

"What happened to the Navy man?" demanded Keen.

"Nothing much, I guess. They just floated out over the place and dropped a rope ladder attached to a cable. Pierre got the guy up on his feet, stuck his legs through the rungs, and they hauled away."

"Simple, eh?"

"You can't beat the Navy," grinned Barney, opening up his parcel.

"You can't beat Pierre, either. What did he say?"

"Say? Nothing. Acted as though he had never seen me before. You sure greased that baby into silence. Why, the bum even made me pay for this."

"Good old Pierre! Who told you about the dirigible picking that guy up?"

"Oh, Pierre sang that—to the tune of *Madelon!*"

Keen laughed and dug into the grub. They made sure everything was trim before they climbed in and started the Avia. Keen was particular about their parachutes and kapok jackets.

"Never mind the guns and belts this time. We may have to take to the silk before the night's over, and I want to be sure we can float—if we have to."

"Oh, it's gonner be one of *thos* nights, eh? There are times when I think we ought to use a submarine. I'm getting web-footed now."

But Barney made certain his 'chute was Okay and he, too, laced on a kapok jacket—just in case.

They climbed in and warmed the Avia carefully. Then Keen ran her well down the depression. He wheeled her carefully around and pointed her projectile-like nose down the clearing between the two walls of rock. He cut out the mufflers to kill the back-pressure and to get every ounce of power available. Then he gave her the gun.

The Black Bullet shot down the clearing like a mad thing. Keen let her get her tail up, but he held her wheels

down until the last possible second. Then with a quick easy movement he hoiked her up with a roar, curled around in a climbing turn, and swept clear of a menacing pinnacle of rock.

They eased off and slammed out to sea. Keen held her steady and finally allowed her to climb gently. Then Keen swept the mufflers back in while he eased her up to the 11,000 foot level and headed for Cape Breton Island.

They settled back for the five hour flight, pondering on what lay ahead. Darkness settled gradually and the Bullet raced south with easy swiftness.

Cape Breton came and disappeared behind them. Then Nova Scotia threw up her lights and they headed for Yarmouth, listening in turn for any unusual radio signal. But tonight the ether was strangely silent and they knew the skulking raiders were taking no more chances.

KEEN wondered what the captured mob would say when they were taken to Lakehurst. Would Furst tell his story straight? Would they explain that they were bribed into the mad campaign by a crazed scientist who believed he had been unfairly treated? Would they tell of Staark's part in the plot? Would they uncover the tie-up between Staark and Heinrich von Braun?

There was nothing to do but wait and see what the night would bring forth, so Keen went back to his dials and instruments.

At last they were racing down the coastline with the lights of Boston under their starboard wing-tip. Below them coursed coastal trade vessels, gay excursion boats, and jaunty cruise ships bearing happy people who knew nothing of the grim menace that was hurtling through the skies toward New York City.

Keen took another glance at his map, checked his time, and peered about with his night glasses. Then suddenly he caught the outline of the *San Diego* cruising toward that rendezvous point twenty-five miles off Montauk. In the distance he could see the sweeping arm of light from the Long Island beam. He turned and took over from Barney.

"Okay, Mick! You'll see some fun soon. Get the hardware loosened up."

Barney slipped back with enthusiasm, broke out the high-speed Brownings, and loaded them carefully. Keen drew a lever up which elevated the hidden 37 mm. cannon from its trough in the side of the port pontoon.

Keen held his height and watched the *San Diego* cruising about for position. Then, Barney caught the bark of guttural German voices over the radio set and slapped Keen's shoulder.

"Something slipped!" he barked. "Don't know what they're saying, but they're damned mad about something."

Keen plugged in his phone jack, listened. He caught the tail end of a German order.

"Quick!" he yelled. "They're switching something on the *San Diego*. We've got to get them."

But before he could dive and send the Black Bullet after the Navy Zep,

Barney was engaged in a mad set-to with a Junkers fighter. They swept through a curtain of streaked fire and lead, while the Mick answered the charge with two tubes of Browning blast. Ahead, Keen could see flashes spurting from the upper gun turret of the *San Diego*.

The Battle of the Behemoths was on!

KEEN could not see what the gunners aboard the *San Diego* were firing at, but he had an idea the enemy airships had been sighted. Barney continued to hammer away at the wild diving Junkers that had attacked them. Lead spattered all about them.

Then Keen saw another broad-winged Junkers slam out of nowhere and dive for the *San Diego*. This was an angle they had not expected.

He rammed his throttle forward, raced at the silver bomber plane. His guns rattled as he pressed every trigger on his stick. Behind, Barney was finishing off the first Junkers with a long, terrible burst of lead. The ill-fated ship swished off sideways, threw a section of its tail away, then rolled over on its back and nosed down in flames.

Keen spat a short burst at the Junker bomber and made it turn away from the Navy dirigible. That gave Barney a shot at an acute angle and the Mick spat a load at the bomber's tail. She swung just as the other had and rolled away. Keen then slammed across the top of the *San Diego* and finished it off with a short barking burst from the 37 mm. gun. The shells bit out a motor, and they saw the plane spin out, flicker in the gleam of the starry night, then plummet down toward the sea with a flame streamer fluttering behind.

Then Keen sighted the *Brandenburg*. It was painted dead black and carried no insignia. But she did carry guns—several mounted in movable turrets along the upper girders. These guns barked and the Bullet jerked under the concussion. Light shells slammed shrapnel toward them. And now Barney was pecking away at another Junkers that was nosing down at the *San Diego*. Where were they all coming from?

Keen swore and rushed at the *Brandenburg* with his cannon firing. He swept up and over, allowing Barney to duel it with the gunners mounted on top. Keen now snatched at the bomb toggles and felt the ship jerk as two fell. There was a dull plop, a strange ripping sound! Then below they saw a horrible trickle of flame run like a golden serpent along a girder of the *Brandenburg*.

Barney shouted and belted away at the gunners again. The Black Bullet staggered under a burst that went through the port wing and almost ripped the aileron out. Keen drew clear quickly, nosed up, poured a long burst at the Junkers, and made it clear the *San Diego*.

Then from below came a great boom. The *Brandenburg* seemed to belch in the middle and show a series of jagged steel ribs. Then the Bullet, caught on the boom of concussion, was lifted hard and flipped over on her back. Barney

slipped the sleek ship clear but he hit the cowling with a crash and rolled across Keen's shoulders.

They came out finally and saw the flaming ruins of the *Brandenburg* tumbling into the sea below. A few men had taken to parachutes—white carnations which blossomed amid the streaks of burning debris.

The *San Diego* swerved left and nosed out of the smoke, her gunners still holding the Junkers off. Keen trimmed his ship, yelled at Barney, slammed at the monoplane, pressing his triggers as he came. The silver bomber folded up and exploded above the *San Diego* and Keen shut his eyes. When he opened them a second or so later, the smashed Junkers was just slipping past the Navy dirigible with only inches to spare.

The Navy gunners pounded it into her all the way down, then turned back to watch the *Brandenburg* hit 6,000 feet below.

"But where's the *Ludendorff*?" Keen yelled.

"Haven't seen her," Barney replied. "They must have cleared and headed west to do the New York job alone!"

"Lord!" gasped Keen. "That's right. They must have found out somehow that the *San Diego* was not in their hands after all. They must have figured something was wrong. But we've got to beat the *Ludendorff* to it."

And so they hurried to the Long Island coast over the flashing light blade of Montauk. They gave the *Avia* all she had. But it seemed hopeless; for the *Bullet* was slowed from the wicked battering it had taken from the *Brandenburg* gunners. The left aileron was flapping badly.

"Wait!" screamed Barney. "There she is."

GLANCING down the Mick's finger, Keen saw a dull, silver something creeping along about a mile or so off the Long Island shore line. He whipped over sharply—only to complete the write-off of the left aileron. It whistled away, making the *Bullet* jerk madly.

They saw the *Ludendorff* skulking onward, trying to sneak over New York to deliver her terrible blow. Keen nosed down, pressed his triggers—but nothing happened!

They now came up over the big dirigible and tried to plant the last two bombs on her broad back, but the *Bullet* jerked so badly due to the lost aileron, that the bombs widely missed their marks.

Barney tried a long burst as they flat-turned over the *Ludendorff*, but the gunners on top easily routed him. They patted the *Black Bullet* with plenty and one of Barney's guns went out with a scream of wrenched steel.

Keen drew clear, hoiked up, and climbed.

"What's the idea, now?" bellowed Barney.

"Good we brought those 'chutes and kapok jackets. We're going for a swim."

Barney sat back, tried to figure it all out. Keen grinned over his shoulder and climbed still higher over the silver *Ludendorff*.

"Get ready, Barney," he yelled. "We're going clean through her!"

"WHAT?"

"Get set for action. When I ram you with my knee, pull the wing-spar releases down there!"

"Holy blitherin' Mother o' Mackerel!" gasped Barney. "What the hell next? How you gonner get the wings folded back again?"

"We're not. We're going to say goodbye to the old boiler, Barney."

"An' I'm supposed to be the booze hound," moaned Barney. "You're crazy!"

"Sure! But it's more fun than being sane . . . now."

"Let's go, then," replied Barney with resignation.

He crawled down, lay on his side, and grabbed the bright steel wing-spar release handles which held the airfoil in position when it was folded out.

The *Black Bullet* poised over the *Ludendorff* for several seconds, then nosed down slowly. As Keen aimed her dead at the big dirigible, they met a storm of shrapnel and tracer. But he held her in the dive nevertheless, using rudder and elevators until the last moment.

Then he jabbed Barney with his knee!

Barney twisted, tugged the pins clear. There was a loud crack as the wings folded back.

Keen held his position for the last few feet, then ducked.

Amid a thunderous cacophony of ripping fabric and dural, the *Black Bullet* went into the *Ludendorff* like a monster vaned projectile! She crashed through like a bomb. There was blackness for a second, a screech of broken metal—then a puff of flame.

Keen drew back on the stick, but she came out clean and continued her dive toward the water. He shoved the cowling clear, yanked Barney up, and rammed him over the side. He pulled a folding life raft clear as he went out himself, then yanked the ring. Above them, the hopeless *Ludendorff* rolled helplessly. Her nose was tilted badly and smoke was pouring out of the great hole made by the *Black Bullet*.

Keen looked about for Barney's parachute and eased his risers to drop as close to his as possible.

They both hit near a stake buoy not three hundred yards off the Long Island shore. It required but a minute for Keen to inflate the folding rubber raft, climb aboard, and paddle over to where Barney was floating happily in his kapok jacket watching the great *Ludendorff* stagger off toward the open sea.

They both watched it for several minutes, their hands clasped. Then they heard an ominous crunch. The *Ludendorff* folded in the middle, heaved two sections away, and burst into flame. The shapeless tangle of dural hit the water three miles away and sent up a visible plume of steam as the red hot girders sank into the sea.

"Home James!" muttered Barney.

"I'll paddle part of the way, but you've got to do your share," growled Keen.

"Where are we?"

"Believe it or not, we're not three-hundred yards from home!"

"Gimme that paddle!" gloated Barney.

AT noon next day, John Scott and Drury Lang sat in their paper-strewn office, trying to make either head or tail of things. Nothing seemed to fit. Lang had chewed more than half way down a black stogie, and Scott was perspiring like a miner.

"But I tell you, I called Keen's apartment early this morning, and he said he had been there all night," Lang argued. "He said he had not answered the phone because he figured it was only the news hawks. He said he wanted some sleep."

"But where has he been for the last twenty-four hours?" John Scott demanded.

"He says he was on a short cruise with that guy, Barney, of his. You can't argue with them. One will lie and the other will swear to it."

"But didn't he see the papers and hear that he was supposed to have been murdered in his own studio?"

"He says no. He says he was on his boat out on the Sound and didn't see any papers. He says he has no radio."

"Okay! then if he was there all night like he says, he couldn't have broken in here sometime after midnight and left this stuff in my safe, eh?"

"What? Did he . . . did some one leave something?"

"Everything. Here's the whole idea all typed out with the names and everything—and it's signed by the Griffon again."

"What's it say?"

"Plenty. For one thing it explains how the *San Diego* was captured and how the whole plot was the idea of this guy Heinrich von Braun who worked in cahoots with Staark. It was a plot backed by von Braun. But he must have been insane. He wanted revenge because he blamed the United States for letting him out of this new dirigible airlines company. He 'used' all the smart dirigible men he could find in this country to do it."

"What else does it say?"

"Well, it seems that von Braun first faked a suicide in Germany, and then when that died down he planned these hangars in the Black Forest where the *Brandenburg* and the *Ludendorff* were first taken and re-fitted for bombing. They also had a pirate crew ready to take over, once the regular crew was overcome by the thugs. The passengers and loyal crew members were imprisoned in the Black Forest hangars and were to be kept there for about two weeks, then gradually released."

"What about those Junkers ships we found strewn all over the place?" asked Lang.

"They were part of the high-speed section of the plot. Most of them were being catapulted off a mother ship anchored off Cape Sable. Those that did land worked either from this Miquelon place or from a jerkwater private drome back of Hartford. Oh, they had it all

planned out swell."

"But I don't see what they could get out of bombing New York," Lang argued.

"No one has been able to figure out why they fought the World War either—but they managed to kill a lot of people. No telling what they might have done, if it hadn't been for that—"

"That Griffon guy," snapped Lang. "Yep, I'd give plenty to know who the hell he is."

"That reminds me. I got a special reward for someone. The Navy Department offered fifty grand for information on the *San Diego*. As far as I can make out from talking to those Navy birds on board, these guys Pulski and Ginsberg are the ones entitled to it."

"Pulski and Ginsberg?" gasped Lang. "Say, chief, take a look and make sure that dough's there, will you?"

"It was last night. In a Navy envelope. I'll see."

He reached in, pulled out the envelope. It was empty, except for a card which said: "Thanks, we can use it—The Griffon."

"Well, I'll be damned!" puffed John Scott.

"Fifty grand!" gagged Lang. "Golly a guy could buy a dirigible for that, couldn't he?"

"No, but he could get himself a nice plane—if he cared to fly," muttered Scott staring off into space.

Fish and Gyps

(Continued from page 14)

just a civilian again. Good day to you!" "Put that in writing!" the Major called after them.

THE Pinkham orders came through despite the skepticism of Phineas' fellow buzzards. In forty-eight hours the Lieutenant was to leave the Ninth Pursuit to head for the States via London.

Then, the night before his departure he dispelled all trace of heart ache that might have prevailed on the drome by plunging himself into an orgy of skull-duggery. Sergeant Casey found his brand new kicks nailed to the floors when he began to dress for an evening in town. The Old Man, at mess, sprinkled a generous portion of paprika over his mealy white mashed spuds and found in a moment that it was snuff. Bump Gillis tore into the medico's shack shouting for an emergency operation after swallowing a couple of tadpoles with his cough syrup. In the middle of the night smoke began to billow from the line of huts known as Rue de la Pays. Groundhogs came in answer to the summons bearing pyrene extinguishers and every other bit of fire-fighting apparatus available on the drome. After they had all gathered, Phineas appeared—keeping a good distance—and told them to go back to bed.

"It was just a smoke bomb that got loose on me," he grinned. "Don't git excited as it will wear itself out in time."

The rest of the night Lieutenant Pinkham perched in a tree. Once he

Advertiser's CONTACT

A LITTLE NEWSPAPER DEVOTED TO A BIG CAUSE ★ OF, BY AND FOR FLYING ACES CLUB!

VOLUME 26

SEPTEMBER, 1936

WHOLE NUMBER 37

"Pictures, Pictures, All Around—But Nothing Advertised to Take 'em With!"

So Writes Dave Hauschild, of Big Fork, Montana

FROM out of the West the other day came a letter from our staunch friend, Dave Hauschild, of Big Fork, Montana. You know, Dave writes us often, so a letter from him is not a news event. But this particular letter contained so much food for thought that old ACES UP decided to pass part of it on to you Buzzards. Said Dave:

Just finished reading the July issue and it surely is a great number. Honest, the magazine is getting better and better all the time, and I don't mean maybe! Nevertheless, I have a bone to pick with you Folks at GHQ and I might just as well get it off my chest right now.

One of the things that makes FLYING ACES so all-fired interesting is the fine collection of pictures to be found in each issue, and when I say this I have in mind the many snapshots sent in by members. Personally, I always get a great kick 'meeting' our fellow club members in the Club News columns, as well as looking over the reproductions of their models in the good old mag.

But why, may I ask, do the camera manufacturers turn a cold shoulder on us? All one need do is thumb through an issue and he immediately becomes conscious of the fact that here is a magazine with pictures—pictures all around—but nothing advertised to take 'em with. Can't our members be prevailed upon to wake up these manufacturers who are doing such a swell job of turning down one of their finest sales outlets?

Fellows, that's a swell letter—and ACES UP feels exactly the same way. Here's FLYING ACES and the F.A.C., with thousands of model builders, most of whom snap pictures of their planes . . . here are thousands of air-minded readers who visit airports regularly to take pictures of the various ships, for their albums . . . here are our "Air-

mail Pals," a majority of whom are interested in photography, and who swap hundreds of pictures each month . . . here are our many F.A.C. Flights and Squadrons, most of them keeping permanent records of the model building accomplishments of members. Yet, in spite of all this, we defy you to find a single camera advertisement in this fine issue. You won't because these camera manufacturers have rated a hundred other magazines ahead of ours as better spots for their advertising copy. As for the F.A.C. being a flying flock of shutter-clickers, they give us zero-minus!

NOW, what are we going to do about it? Of course we can continue to ignore the situation and let other magazines continue to scoop off the cream, but are we going to do it? You fellows know as well as ACES UP that the advertising columns of FLYING ACES represent a fine opportunity through the medium of which camera sales and supplies can be pyramided by enterprising camera manufacturers. But our being conscious of this fact does not help very much—it must be transmitted to the manufacturer.

The next time you buy a camera—or for that matter a re-fill—get the name and address of the manufacturer and write him to the effect that you believe he could increase his sales by advertising in YOUR magazine. Point out that FLYING ACES has the largest guaranteed circulation of any air publication and that you are but one of 50,000 members of the F.A.C., a large percentage of whom are model builders—and therefore camera fans.

Come on, F.A.C.'s, old ACES UP wants to see some good camera advertisements in FLYING ACES and you can turn the trick if you'll just write a few letters. We're counting on you!



Here we have Dave Hauschild with three fine trout caught in a local stream. Dave reminds us that fish get eaten and plane models are often smashed—so film "evidence" is indispensable.

contemplated the theft of a means of locomotion and began to descend. But Sergeant Casey had decided to sit up with Phineas. The Boonetown warrior had no sooner hit the ground than a gun boomed near "A" Flight's hangar. A bullet thudded into the bole of the tree and the escaping Yank zoomed into its branches again.

"Cripes!" he heard Casey wail. "I missed. Wouldn't that bust ya?"

A booming voice burst from the farmhouse just then. "What's going on out there? Who—?"

"Lieutenant Pinkham was tryin' to steal a Spad!" Casey hollered in explanation. "I shot at him."

"Good work!" Garrity thundered and a window slammed down.

"It is a pretty pass I have come to," Phineas groaned. "Well, it's strong milk that don't turn sooner or later. I'll show these bums!" He squirmed on his roost to favor a sore spot on his empenage.

IT was mid afternoon next day when Phineas Pinkham departed. The squadron car pulled out of the drome, a great lettered banner flying in the wind, to wit:

**ADOO, ADOO, HA! HA! ADOO!
ADOO TO PHINEAS PINKHAM!
WHATEVER TUB HE SAILS UPON
WE HOPE THE HEINIES SINK
'EM**

The knight departing to conquer home dragons had eyed the banner askance but had not removed it.

"That's very funny," he had sniffed. "Like a baby in a crib caught in a log jam! Awright, bums, I will remember it. I know who my friends are now. To hell with all of you!"

Captain Howell had dug up an old trombone in Bar-Le-Duc and Bump Gillis was blowing the insides out of a harmonica. Sergeant Casey cooperated with a piccolo to murder an ear-splitting rendition of Tosti's *Goodbye* very smartly. There were many notes from Howell's trombone that sounded much like the well-known Bronx "bird" to the departing ears. Altogether it was quite a ceremony.

"Go ahead—have your fun," Phineas said airily as the car rolled out into the Frog road. "But wait until Glad Tidings Goomer makes you the next batch of biscuits. Haw-w-w-w! There is roach powder in that flour sack. A doo, and I hope it's for good, you fair weather friends!" He pulled a long narrow pasteboard cylinder from his pocket. From inside the container that had arrived in the morning's mail he withdrew a small publication entitled, *One Thousand and One Up-to-The-Minute Parlor Tricks*.

"Boys," he enthused, settling down to absorb "How To Be Entertaining and Not a Wall Flower."

Hours later Phineas alighted from a boat train in the Victoria Station, London. He bounced out of the station in true Pinkham fashion and hailed a hack.

"Garsong! Er—haw—I mean! O! Chappie! Blimie if I don't want to see

the jolly old worse side of Lonnon—pip pip! To Limehouse, old thing, where I shall hob-nob with the hoi polloi."

"If yer arsk me," the cabby nasaed, "Hi think yer a bit orf in the 'ead. It ayn't syfe down there fer a cove like yer, but, blarst hit, hif yer wants ter go, hit ayn't no business of 'Arold Flimpkin's, hit ayn't. Giddap, Disraeli!"

"I have never seen Limehouse," Phineas called out when the hack crawled away from the curb. "I have always wanted to see them make lime juice. Don't spare the horse, Marmaduke!"

"What did yer call me? Strike me pink, Hi'll—"

"Haw-w-w-w-w!" guffawed the passenger. "It's just a pleasantry, my man. Have on with it—haw-w-w-w! Stop at the first fish an' chips shop in Limehouse."

Phineas had no way of knowing that the cabby did not take him to the requested section of the aged city. But the place where his vehicle finally stopped was disreputable enough for the most hardened slum addict. The fare dismounted and paid up, then looked about him. Fog was settling down as thick as pea soup and the smells were even thicker. The Boonetown flyer on the loose groped his way to a fish and chips shop and walked in. His nose twitched. The interior of the ill-lighted place devoted to the purveyance of fried finned denizens of the deep was reminiscent of a glue factory.

"Gor blimie, a flyin' orfiser," a little cockney squeaked with awe. "Strike me balmy, tyke a look, 'Arriet. 'E's a 'omely blighter, ayn't he?"

"Bong swar," Phineas grinned at greeting to the motley group of eaters. "I'd hate to light a match in here," he added *sotto voce*. "Everybody is grease to the ears." He stepped up to the small counter and asked for a sack of the national viand. A bit of the fish as a sample proved not half bad and Phineas hied to a gloomy corner of the stall to finish the rest of his purchase. Soon a little man wearing a cap and a muffer around his neck sidled up to the Yank. What little face appeared above the muffer showed a nose as hooked as a Turkish carving knife and eyes huddled closer together than a couple of scary old maids in a haunted house.

"Evenin', gov'nor—lootenant," began the Limey. "It's a fair treat to meet hup with a 'igh clarss cove—yus. But hit ayn't syfe for a gempman like yer to be alone down hin Jippin' Street, hit ayn't. Yer needs a cove ter see yer abaht. Fer a shillin', Lootenant—"

"Sure, ha-w-w-w! You can be my man Friday," assented the trouble-hunter.

"Lorks! An' hit bein' only Chewsday," exclaimed the cockney. "Yer could git kilt a dozen times, Lootenant, 'fore—"

"Just let it pass," Phineas sighed, heading out into the foggy street. "Come on, garsong, we'll *allez*. I don't think they will like the soap chips I put in them bags of fish on the counter!" Again the Yank failed to see the gleam in that pair of eyes. The fog hid the Limey's expression very well. On a

nearby corner the escort stopped and pointed at the figure of a bobby that loomed up in the soup.

"Yer know, Lootenant, Hit's 'im that 'as got a son in the Hair Force, too. Blimie, I bet yer 'e would lyke ter arsk yer abaht the Boche han' hif yer knows the lad. Go hon, Guv'nor—Hi'll wait 'ere for yer!"

NOW Lieutenant Pinkham was a babe in the London woods. How could he know that the cockney was contemplating a solo raid on a jam dump close by? He couldn't. So he went over to the bobby and bade him a pleasant good evening. He introduced himself and the bobby lost all interest in his beat, forgot his duties included looking in on the jam factory every fifteen minutes. And he talked for half an hour with the Yankee Spad pusher.

"Yus—my lad is with the King's Hair Force," he repeated again and again. "Givin' the Boche bloody 'ell fer a fack, me lad. Lootenant Ronald 'Ammershead is his nyme. Yer got to look the lad hup—yuh—ugh—ugh—blimie!" His eyes had caught a glimpse of a strange light in the window of the jam dump. His boots started into motion when he heard a lot of other ones pounding against the cobblestones. A knot of figures loomed up in the mist.

Somebody was yowling, "Catch the bloomin' orfiser! The blarsted cove put soap in me fried mullet—'ave at 'im!"

"Wha-a-a-a?" yipped the bobby. "Orfiser—why yer bloomin' liar! Yer stands me hup 'ere talkin' while yer blinkin' pal goes orf to rob a syfe!"

But Phineas Pinkham was not paralyzed. It was enough to have the fish and chips circus hot on his tail without being forced down in the name of the King. He hedge-hopped to Aldersgate Street and fairly flew to Southwark Bridge. Everywhere whistles were blowing. He changed his course and ducked through a labyrinth of lanes under cover of the fog and soon came to a landing on the curb of London Bridge itself.

"Well, I'm seein' the town," he grinned, making a beeline for a motor cab. He leaped in and yelled, "Anywhere out in the country, guv'nor. And step on the petrol. Oh, that Limey—makin' me an accessory! Boys, it's the King's bastile if I—hey, what's the trouble with this boiler? Have its arches fallen? Oh-h—"

"Hi'm doin' forty," the cabby yelled back at him. "Flyin' gempman, ayn't yer?"

"Haw-w-w-w! That's what I thought. Have at it, my good fellow, and don't stop for even a coal barge."

BO-O--OM! CRA-A-A-A-SH!

"What in h—?"

"Gor blimie hif hit ayn't the bloody Boches!" howled the cab driver and his hack crabbed toward a lamp post. "'Ere's where yer stop orf, guv'nor. Blink it, I ayn't playin' no tag with bloody Zeps, naw."

"Well, adoo," Phineas yipped as the cab stopped and the scared Limey headed for the nearest cellar. "I bet I'll get more out of this jilopi than you did.

Adoo, God save the King—the Queen an’—” He stepped on the starter and threw the hack into gear. Stabs of light flashed into the sky, sirens screamed, and the streets became as empty as a Scotch poor box. Zep eggs were cracking up all around the neighborhood through which the Pinkham chariot was tearing at maximum speed.

“Some *guerre!*” he yipped. “It chases you when you try to leave it. I—”

BO-O-O-O-OM! CRASH! BANG!

The Yankee pilot of the Limey land bus looked on. The beam of one light kissed the belly of a Teuton airship. Shrapnel was biting the fog to shreds when Phineas found himself out of petrol far beyond the outskirts of London. He leaped out of the hack and kicked at a fender. Somebody grabbed at him.

“Thank heavens, my good fellow,” a voice tossed at him and Phineas turned to look into the face of a British officer. He saw the red tabs on the fellow’s tunic and not far away from him crouched two British fighting busses. “Jolly well thought you’d never get back! Let’s go—we’ll knock one of the blighters down or my name isn’t Yates-Smythe—by gad!”

“Uh—er—” stuttered Phineas, for a moment nonplussed, “the fog is a bit thick, eh? Uh—well, huh, it’s better to ‘go west’ than speak pieces at old dames’ afternoon clubs. I don’t know Camels very well but I will try anything once, as the monkey said when it stuck its tail into the meat chopper!” Tossing off his trench coat, the Yank obligingly headed for one of the Camels. A mechanic almost knocked his bellows dry in the fog.

“Blarst it,” yipped Phineas, “I’ll jolly well—look smart, guv’nor—er—my good fellow—and me the—er—hand me the flyin’ togs. Pip pip, an’ all that. Jolly bombardment, what old bean?”

“Drunk!” he heard somebody conclude.

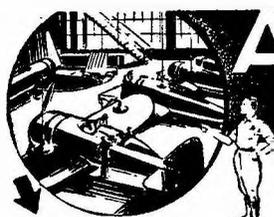
A prop roared and one of the Camels shot across the sod. Phineas was assisted into flying leather and boosted into the other Camel’s pit.

“Good luck, sir,” yelled an ackemma. “Knock orf their blarsted ‘eads!”

“Yeah—haw-w-w-w-w-w!” and the Yank at strange controls gulped as he fumbled around them. The prop was turned over, caught a spark. Phineas waved and gave the Camel the gun. It slid across the field, took off with one wing almost scraping berries from a gooseberry bush. He fought it to even keel and managed to miss a church steeple at the cost of half the landing gear.

“I would just as soon handle a drunk sailor,” he breathed as he drilled up through the mists. “When you blow on the stick, it goes into loops. A Camel they call it—haw-w-w-w, I bet Aunt Sarah Pinkham’s nephew goes more than seven years even without drinkin’. Well, here goes—ugh!”

NOT fifty yards in front of his trucks a great shape loomed up. Lights from the ground illuminated great



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numerals on its torso. L-72! The sound of its Maybach engines drowned the sullen grumble of the Camel engine as though it were nothing but a humming bird’s love call. Desperately Phineas zoomed and there was nothing to spare between him and the top of the Zep. A high angle machine gun ripped bullets through his wings and wiped a strut away as if it had been a mere stick of uncooked spaghetti.

“That pea shooter is no sissy,” the Yank yelled as he sideslipped, “but wait until I get started, you Heinie—von Sputz is it? The von’s papa, haw-w-w-w-w! Fancy meetin’ him in dear ol’ Lunnon! The world is small.” Snap! Phineas felt a tightness in the region of his pantry give way and the blood in his veins became sherbet. He felt himself parting company with the Camel.

“Adoo everybody!” he choked out. “Here I come! Boys, if—I could—only see—that batch of biscuits Glad Tidings Goom—”

Down—down! Then kerplunk!

But Phineas knew that it was not the ground that he had hit. The ground could not lip, “*Mein Gott!*” And it would not be hot like the thing over which he was half draped. It was the business end of a machine gun and a Kraut was clawing at his throat. That was unpleasant so the Yank decided to do something about it. He banged the helmeted Teuton on the nose, hit him three times in the same place and was rewarded by seeing the Kraut slump into an inert heap. Phineas then shook

his head savagely and looked his position over.

“Well, I’m a cock-eyed—haw-w-w-w! It ain’t my time to ‘go west.’” He saw that he was in the open turret on the roof of the Kraut Zeppelin. Below him was a yawning passage down through which an iron ladder was visible. The seconds were very important, like at a major operation, thought the nomad of the air. He tugged and hauled until he had removed the outer shell in which the Boche gunner was wrapped. It was working under difficulties with the ever-present risk of a Heinie making his way up the iron ladder. That very thing happened just as Phineas was preparing to struggle into the confiscated Boche regalia. A face appeared out of the confines of the Zep. Not for long, however, for the Yank made a dead shot with a heavy boot. The Boche sighed and tumbled down to the catwalk.

Shrapnel banged around the Zep. A Camel got in close, hammered for several breathless seconds at the bag and then went sweeping away into the soupy ozone. A shell broke up close to the big cigar’s short ribs and there was a crazy lurch. The gunner Phineas had deprived of his marbles started to slide away. His ankle was the nearest thing to the Pinkham fist and therefore was firmly grasped. Hauling the groggy Kraut close to the gun mounting, Phineas hurriedly tied him to it with a heavy wire produced from his tunic pocket.

“If it don’t hold, it is not my fault!”

grinned the miracle man from Iowa. "I—why, if he's not wearing the crest of the von Sputzes! My, my! Haw-w-w-w!" As he was speaking Phineas was bundling himself hurriedly into the stolen livery. The flying suit had no buttons. The boots were felt-soled. With a woolen scarf wound around his face close up to his eyes, the Yank started to descend into the belly of the Zep. At the foot of the iron ladder another Boche was looking at the limp figure which had vanished from sight at the impact of the Pinkham hoof. He looked up at Phineas and stared wild-eyed.

"Ja," the Yank guttured, "*Dumkopf!*" He slid along the catwalk, met two more agitated Krauts near the huge fuel tanks. Phineas translated enough of their thick jargon to know that the fuel was giving out. A Zep without fuel is as helpless as a one-armed man fighting a bobcat. He yelled at a big Von, "*Der gun—kaput—ja!—Mein Fader—?*"

CRASH—BA-A-A-ANG!

The big bag swayed sickeningly. Phineas noted that the Krauts were nearly gaga by the rigors of the flight from the Rhineland. He handed them a bar of chocolate which they grabbed at eagerly.

"Eat an' eat hearty, *Mein Froids,*" he chuckled as he made his way to the control pit up forward. "You will sleep like little Boy Blues, *ja!* Cripes!"

BLAM—BLAMETY—BLAM!

"Boys, that one was close enough to singe my eyebrows. If they ever light this gas—it is—well look at the bums tossin' things through the hatch! Why it's guns—grub—winches—even their shoes. Haw-w-w-w! Who's afraid of even lions that have their teeth yanked out. Oh, boys!"

"Rudolph! *Ach, Gott sie dank!*" a voice bellowed from the passageway leading into the big egg-shaped gondola. "*Ach, das ist badt. Ofer der Channel ve iss und der tanks empty.*" A big Dutchman with a face as long as a giraffe's grabbed at Phineas. One eye was monocular, the other half closed. Some shrubbery around the chin emulated a goatee with its point amputated. His nose could not have been covered even by a hand as big as the Pinkham paw.

"*Himmel!*" breathed Phineas. "In der car I go, *Mein Fader,* for der *Faderland.* You let me down und I tell you where *ist ve are at, hein?*"

"*Ach, Englander ist you talk mit all der time, Rudolph. I vish you nefer vent by Oxford—bah! Sehr gut, Mein brafe zon, zo ist das.*" He barked out orders into the confines of the big ship. A little Heinie, shivering with the cold of the high altitude, appeared out of nowhere, it seemed, and strung off a line of German. Phineas saw von Sputz stiffen and heard what he knew to be some rich, round Teuton oaths.

"*Dumkopfs, Hans he says they go to sleep yet, Rudolph. They shouldt be dropped ofer der side mit der machine guns. Br-r-r-r. Cold ist, budt high oop ve moost stay, Mein Rudolph. Ach, slow ve go! Der telescopes, der hear instruments, they holdt us. Himmel, budt*

nefer shouldt ve ledt idt them go, nein. Back by Chermany moost ve go, Rudolph, ja. Ach, der shells, they coom closer mit!"

PHINEAS PINKHAM alias Rudolph von Sputz took something from his pocket and handed it to the Zeppelin commander before he stepped into the little observation car that was to be lowered by a wire cable down through the swirling mists that obscured the angry drink that was the Channel.

"For der *Faderland!*" he yipped. To himself he wailed, "I don't know what I asked for this for" when the little cockpit sank deeper and deeper into the mist-shrouded wide open spaces. "Boys, if they cut that cable! For der *Faderland!* The bums, well, I won't hit like I am sittin' on an eiderdown pillow. Ugh—what? *Ach, high oop ve are und der shore line by Belgium I see, ja,*" he growled into the 'phone. "*Das ist gut? Nein?*"

"*Ach, Rudolph, das ist gut. Ve be home vunce already.*"

Phineas guffawed, but the Kraut Zep boss did not hear it. The Pinkham mirth was a little strained when a gun boomed from a ship in the water below. A shell broke up and a hunk of melted-down stove lid bounced off the lofty crib of the first-born of the Boonetown Pinkhams. Riddled in many places, the Zep was losing buoyancy fast. But the swirling fog still prevented a view of terra firma from the control pit of the L-72.

"Rudolph," came Papa von Sputz's stentorous voice. "It gets varmer, *ja?* Are ve close to der ground, Rudolph? You hear Papa, Rudolph *hein?*"

"Dry t'ousand feet I bedt you *mein life,*" yipped the pseudo-son, his voice thickened by three inches of wool. "*Der cinch ist!*"

"Vhat?"

"Der winch, *Fader,*" Phineas corrected himself, "*das ist. Lower I should go yedt.*"

The swaying, flimsy pit dipped down. Phineas said a prayer and began to speculate on his future—of which there didn't seem to be much left. Time dragged like an anvil hitched to a turtle.

But finally dawn began to break and with it the mists began to lift. Once Phineas spotted scenery through a rift and swore that if he ever got down to it again he would eat a quarter of an acre of grass raw. He hoped it would be Switzerland. There would be snow on the ground and he was thirsty.

"Rudolph," came the voice of Herr von Sputz. "*Ist you dere, Rudolph?*"

"Ja," replied Phineas in a sleepy voice. "*Der banks of der Rhine I see. Ach das ist gut, ja!*"

"*Gott sie dank,*" came the reply into the ear phones. "All *ist kaput* almost oop here. Dey *ist asleep yedt, Rudolph, Himmel!*"

Phineas removed his head phones and chuckled. They were not more than a thousand feet up and still sagging. Hydrogen was escaping all over France. That chocolate bar—the thought of it made him guffaw. But if Phineas had

known what was transpiring in the gondola of the L-72 he would not have bothered to laugh. An indignant half-frozen Kraut with a duelling scar across his left headlight was barging into the control pit. Clad in a heavy union suit and nothing else, he faced a stupefied *Herr Papa.* A disc hung from his neck, bearing the crest of a well-born Junker tribe.

"Rudolph—how *ist* you climb oop from der car, *hein?*" snapped Herr papa. "*Gott—Donner und Blitzen, was ist? Put idt on der suit. You catch him death mit cold, Rudolph!*"

"Das Pingham," von Sputz the younger blurted out. "He falls on der Zeppelin, *Fader,* und steals *mein* suit. Der chocolate mit der sleep stuffink he giffs by der crew. *Ach, ein piece I find und he smells like der—Fader, gedt idt das Pingham. Where ist?*"

"*Ach, bummer! Schwein!*" von Sputz Senior yelled. "Der cutters, Rudolph! In der million pieces he goes by der ground yedt. Ho! Ho! Calls me *Fader, hein? Ofer der Rhine, Fader! Das ist gut, Gott! Mach Schnell, Rudolph, und ve cut idt der car loose vunce. Ho! Ve gedt idt das Pingham. Budt where ist he gedts idt der coat uf arms of der von Sputzes, hein? Der Deffil he ist.*" Then Herr papa, yelled into the communicating phone.

"Hah, Herr *Leutnant* Pingham, *hein?* Smart *ist* you are. Vell, *Auf Wiedersehn, Herr Leutnant.* Ve giff you der fast landink, *ja. Schweinhund, you hear me vunce?*"

"Vunce is enough, Herr Bum!" retorted Phineas, looking down at the ground with a sinking sensation. A hundred feet—no more. It would take the Krauts—those who were still on their feet—several minutes to cut the heavy cable through. Fog was hanging low over Frog real estate, settling down from the higher shelves of the ozone. The spinning, lurching cockpit plunged into a thick gob of that fog.

IT was Major Rufus Garrity who first saw that strange sight on the drome of the Ninth Pursuit Squadron. He had arisen early and opened the window of his chamber to gulp big chunks of air. When that *thing* swept toward him, he almost fell out of the window. It was like an airplane cockpit suspended on a wire and somebody was in it. Atop the passenger's shoulders appeared the unmistakable Pinkham physiognomy, goggle-eyed now and with teeth bared. The Old Man reeled back into his room, pawed at his eyes and then went tearing down the stairs. Three pilots getting ready for the dawn patrol were in the big room below when the C.O. fell down the last three steps.

"I'm nuts—I've gone nuts!" Garrity gibbered. "I saw Pinkham—in a Spad with all of it eaten away but the cockpit. No wings, no engine—no tail! Take me away before I get violent. Don't look at me like that—I know I'm cracked—but I saw the baboon! Oh," he moaned, "I knew I should've quit this outfit long ago. Gawd! I'll never forget that face—laughin' at me—the fat-head."

Just then Sergeant Casey came staggering in. "I gotta go to a horspital," he howled. "Where's the C.O.? I'm nuts. I gotta be observed. I seen somethin—an' I ain't drunk. I wisht I was, honest fellers. It was hangin' by a wire. I heard some funny sounds up in the fog. Lootenant Pinkham reached out an' tapped me right on the dome an' says, 'Haw-w-w-w-w!'"

The Major grabbed Casey. "Y-you mean that? Then I ain't nuts?"

"Nossir—I didn't say so. I says I'm nuts, sir! As plain as anythin' I seen—"

Phineas Pinkham was laughing when he stood up in the Zep go-cart and picked out a soft place to land. Too late, the Krauts had tumbled to the joke-smith's ingenuity. The great gas bag was close to the ground now. Dead ahead there loomed a steeple of a Bar-Le-Duc church. The car at the end of the cable suddenly fell loose and Herr Pinkham fell twenty feet into a load of Frog vegetables. Mules snapped their traces and headed for parts unknown. Cart, vegetables, and Frog driver pancaked in the middle of the muddy road. Phineas crawled out from under some cabbage, spat out a gob of parsley and looked around him. Overhead the crumpling L-72 was floating straight for town.

"Chien!" screamed the Frog peasant. "Ze wagon she ees pouf! Boche oui? Fall out of ze balloon, non? Ah, I keel you. I br'ak ze tete avec ze tres big rock, son of ze peeg!"

"Not ce matin," decided Phineas, hitting the Frog in the chops with a turnip as big as a Spad's nose. When he got up, he could not run in the bulky, furlined Boche high-flying ensemble. A motorcycle's staccato roar spun him around. A Yankee dough rode up and peered through the early morning fog at Lieutenant Pinkham. He peered a second too long for a turnip bounced off his nose and he back-flopped like a circus clown out of sight into a Frog pond just off the road.

"Haw-w-w-w!" enthused Phineas. "It was quite a night. To Barley Duck, my faithful iron horse to nip the Krauts in the bud. Haw-w-w-w-w! If I live to see the Sphinx rot, I will never forget the Old Man's face when he saw me in that tub—oh, boys! An' Casey—it's killin' me!"

AT the Ninth Pursuit Squadron every vehicle was being brought into play. Bump Gillis grabbed the Pinkham bicycle and followed in the wake of a truck, two squadron broilers, and three motorcycles. Wires were buzzing along the front. The L-72, driven off its course after a raid on London, was floating lazily over France and losing altitude helplessly. Certain brass hats, having heard the report that Phineas Pinkham was dangling from it, threatened to place a ban on all strong drinks the length and breadth of the front.

The L-72 cracked up against a church steeple in Bar-Le-Duc and settled like a dachshund with its wind knocked out. Five Heinies went gaga when the control gondola kissed the

side of a butcher shop and plunked against cobblestones. Herr von Sputz tore into it from the catwalk, trumpeting, "Der charts—der plans—der instruments mach Schnell for Deutschland. Rudolph, der charts in der—!"

"Oh, ja?" came a grim voice from the window of the wrecked gondola. "Hoch the hands, Mein Froinds. I haff the roman candle not made in Rome, haw-w-w-w! There's lots of gas still oozing out and if I just light the tip of this and start it poppin—even for the Faderland, von Sputz, it is foolish to git fried like fish an' chips, hein? Thanks for the buggy ride out of London, Mein Herrs."

"Gott—das Pingham!" moaned Herr von Sputz. "In der air he youmps in der ship mid der coat uf arms of der von Sp—Donner vetter—Himmel!"

An' don't forget Blitzen!" yelled Phineas. "Now that's bein' a good Dutchman as just think if you got stubborn, you wouldn't ever see any more beer gardens again. Climb aboard, my hearties, an' collect the swag," he yelled at a dozen doughs who had swarmed around the mashed sausage. "Search good as there's a lot of sleepin' beauties in the wreck somewhere. Haw-w-w-w, that was good chocolate, von Sputz. Why don't you feed the suckers an' then they wouldn't bite so quick like hungry guppies?" As he spoke, Phineas broke the little cardboard cylinder in two with his hands. It was hollow save for a piece of paper he had shoved in one end.

"Fooled ya, haw-w-w-w!" he cried to the sputtering Krauts. "Just long enough so's you wouldn't tear up the papers an' save the brain child that was goin' to wash up the Limey pig-boats. Well, be seein' ya when the jails are out after the guerre!" He turned away to look into the gaping mouth of Major Rufus Garrity.

"You should have them out," he advised the C.O. "Them tonsils are filled with carbon. Oh, I must tell you why I—er—huh, I was just goin' through London—"

"So it was you, you big lunthead! In that thing," the Major gasped. "How in the name of—did you get into that—? Look here, talk fast! You were sent back to—"

"The cigar here put a stop to my speaking tour," the culprit interrupted, jerking his thumb. "I had to go high for it, haw! Boys, look at the band on that cigar, L-72. It's lost its filler, though, an' the wrappin' is a little frowsy, but I got it for ya! Let me see you bite off the end, Rufe—er—sir. You look just mad enough to. Well, if you'll let me by, I think I'll go to a hospital an' get checked up. It's a caution what I've been through."

PHINEAS PINKHAM'S story of his latest amazing exploit was like the old tale of the big stuffed fish hanging in the trophy room of the anglers' club. A little gink came in and looked at it, then shook his head and said, "It's a lie. Nobody ever caught a fish that big."

Over near the front, the Commander-in-Chief of the A.E.F. was told how

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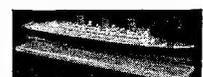
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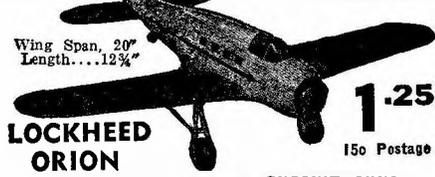
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Phineas Pinkham had downed the L-72 with his bare hands.

"I don't believe it," the General is quoted as having said. "Don't be silly." Foch said, "Voila—somebody ees a leetle cajard, oui!"

And Haig contributed, "Raw—ther!" But the Kaiser did not scoff. Emperor Bill stamped across a polished floor in the Royal Palace, skimmed his spear-tipped hat out of an open window, and swore he would get a slice of the Pinkham throat if he had to enlist in his own army to get close enough to the Yankee upstart to do it.

"Himmel," he groaned. "Why ist he

was not born a Cherman? A year ago und I would haff been by Paris, Ach!"

Herr von Sputz and his son corroborated the Pinkham feat to the letter and the Boonetown hero received confirmation for the Kraut stogie.

Coming out of a binge later, Major Garrity was stopped by a salute from Sergeant Casey. "I—I'm glad, sir," the boss ackemma said, "that we really seen Pinkham. We know we ain't nuts, huh, sir? It's quite a load off—"

"I'm still not sure," the Old Man muttered as he walked away, shaking his head as though there were a bee in it.

Diving Bomber vs. Submarine

(Continued from page 15)

Some of the sub crew have brought out a plane, others are manning the A-A gun on the fore-deck—a modern A-A gun that's mighty deadly. But can it be brought into action quickly enough?

The first Martin is zooming after its dive, its bomb having hit on the port side of the undersea craft. The second plane of the dive-bomber formation is now seen hurtling down. The pilot has put his sights on the target; now he's let loose with his explosive egg, and . . .

WHAM!
 OF course, the sub builders are designing new and more efficient vessels every year. They may develop something that can withstand the dive-bomber or elude his eye. They might develop certain tactics to foil the dive-bomber. Yes, there's an opening for a bright young man who can devise maneuvers for use by the subs.
 What's your idea?

Sky Flicker Cocardes

(Continued from page 22)

spite of the appeal in those blue eyes—you can ask a stunt man to give you all his worldly goods, even to his last sou, but don't ask him to quit trying to die. That's his life!"

"But I don't want him to die!" She meant it. I just sat and looked at her. It was like a good, clever general suddenly giving away all his secrets to the enemy. Skeet took one look at the two real tears trickling from those lovely eyes, and turned to glare at me.

"Pull out, you ox," he grunted. I got huffy. Nobody can kick me in the teeth with a gentle hint and get away with it. I stalked out of there.

A WEEK of high-fever production rolled along, with the war picture moving smoothly down the skids. Already a date for the premiere had been set at the biggest movie palace in Hollywood.

And the day drew nearer when Jay Jackson would be through with the close-ups, long shots, and promotion stuff involving the monster, twin-engined Gotha. It wasn't a real Gotha, but it sure looked like one. Its huge black crosses brought back a lot of memories. And big? It loomed up like a church.

Skeet hadn't backed out. He was going to crash the big baby, but he didn't look happy about it. Gretchen had forced the issue, I learned in my prying way, and had put it up to him cold turkey; either quit taking long shots with his life or else. The battle had ended in a draw, which did nobody

any good. She drew the line on that stunt, and Skeet drew the line on giving it up, and there they were. So Skeet no longer whistled like an untutored mosquito; he went around glooming. He was still mad at me, too, for no reason except that I had been there when Gretchen had issued her ultimatum.

Maybe that's why I was fool enough to go through with the idea that came to me when Jackson started raving about the lack of publicity his picture was suffering. When he put me on the spot I came right back at him.

"I'll give you a yarn that will break page one on all the papers in the country," I snapped. "Get an earful of this!" And I spilled the whole works about Skeet and Karl, their wartime sky fight, and everything.

"Wotta yarn!" Jackson yelled, his black eyes popping. "I'll put Karl in the combat plane. The tables turned in peace time! German ace and American pilot to re-live war in friendly battle! Man, that's a natural!"

I regretted my loose tongue at once, but the director was a man of action. He gave me a drink, slapped my back, and promised me a raise. Then he rushed out to find somebody to give orders to. I felt like I'd stabbed my best friend in the back.

But the worst of the whole situation didn't dawn on me until I saw Karl and Gretchen dancing together at the Montmarte. This was a nice howdy!

I didn't have the heart to stick around the lot and see Skeet suffer. I told my lanky assistant, Hank Court, to get the

art work while I wrote the story. When he laid the still on my desk I felt sick.

They had posed Skeet and Karl beside the Gotha, shaking hands. Between them was the black cross of Germany, and it looked about as cheerful as the "X" that marks the spot where the body was found. I studied the faces of the two flyers who had buried the ax and were now bosom pals. If ever I saw hate in a pair of faces, I sure saw double this time!

You could see Skeet was bitter—tight lipped, like one bearing the tortures of the pit. And an almost identical expression was mirrored in every line and furrow of Karl's face. Only their half-smiles, like grins on a death's head, tended to ease the "shot."

I should have obeyed the impulse then and there and torn the picture to bits. I should have set a match to the story I'd written. But I didn't. Skeet was right—a man can't back down on his job.

Of course, the story splashed high, wide, and handsome on the public prints, and Jackson, rest his soul, thought it was the best bit of publicity ever put across. The papers put it on the wire, and in a few days we were getting clippings from all over the country.

I WENT off and drowned my troubles, and didn't show up until noon the next day, after the story broke. And then I got another shock. The morning paper carried a photo of Gretchen Heyward and announcement of her engagement to Karl!

Jackson popped into my office while I was staring at the paper.

"Great stuff, Jimmy!" he yelled, smacking his hand on the sheet. "You boys are keeping the pot boiling. These follow-up yarns are swell. And tomorrow, old son, we'll go out and dump that Gotha. Want to ride with me, in the camera ship?"

"I don't feel well," I said.
 "Come on, snap out of it!" Jackson growled. "You got to be on hand. That crash will give you a swell follow-up."
 Jackson was a good prophet. But "swell" was not the word.

Hell would have been a better one to describe the follow-up story that broke the next day.

I was up at dawn, ready for the execution.

It was a clear, cloudless morning, and not at all the weather required for the sky shots. You've got to have clouds to give perspective to the scene, but Jay Jackson isn't an ace director for nothing. He had some nice fleecy clouds picked out, sorted, and parked up the coast about an hour away by plane. We could fly up there as soon as everything was set.

Out at the field things were going around like a Ferris wheel—somebody up in the air all the time. The huge Gotha was surrounded by a crowd, which no amount of assistant directors could keep away.

Skeet showed up pretty soon with Sammy Hooker, his pet mechanic. Sammy was one of those penguins who worships the bird with real wings, and

he sure worshipped Skeet. And when it came to tickling the innards of a motor with a wrench, Sammy had 'em all beat.

One of the camera boys said that Sammy had insisted on going up with Skeet to work the smokepots. Then Skeet shoved through the crowd, shadowed by Sam, and I caught his eye for a moment.

"Happy landings, Skeet," I said.
 "Thanks, Jimmy," he said. "I—well, you know how it is."

"Forget it. I'll be seein' you, kid." Then he was hustled along by his greasy shadow, and they climbed up into that flying boxcar. Grease monkeys swarmed out front. Linking hands, they ran the props over. Hats went sailing from the mob behind the Gotha when those props "took."

I looked around for Karl, but learned that he had come out early, tuned up, and taken the air. When I went over to Jackson's ship I saw Karl come in and taxi across the field.

Cap Newhouse, the technical director on the air stuff, grinned at me and jerked his head toward Karl's bus. He lowered his voice to a whisper.

"Look at that big blond bozo, Jimmy. He's been off sulking. I understand Gretchen and he had a tiff."

"Fighting must be a habit with her," I opined.

Cap made a face indicating caution, and rolled his eyes. Then I saw Gretchen, half hidden by the group around Jay Jackson.

"I'll give you the lowdown," Cap said confidentially. "She didn't want him to pull off this stunt. Said if he'd back out, maybe Skeet would."

I couldn't figure that one out, and told Cap so.

"You mean she's still worrying about Skeet, when she's engaged to Karl?" I snapped.

Cap sighed and looked at me like a sad parent whose son has just asked how far can a cat spit.

"F'gosh sakes, Jimmy, didn't you know that Hank Court piped that engagement yarn as a follow-up on your story about Skeet and Karl fighting in France?"

Then Gretchen saw me and came over. The poor kid looked as if she'd been losing all her sleep except the beauty naps. She was almost prettier than I thought permissible for an unsung sap like Skeet. She'd rate in any mogul's harem.

"Has Skeet come out yet?" she asked. Then, sort of embarrassed: "I wanted to wish him good luck."

"Sure, he just climbed in—" I began. But Gretchen gave a gasp and was off. I could see her shoving through the crowd like a kid at the circus, but just as she got to the ropes the Gotha began to open up its motors. It started down the field in a ponderous, lumbering takeoff, and heaved into the air.

Jackson's ship, warming up, gave a snort or two, and I realized I'd better get going. There was one seat left in the cabin when I climbed in. Jay Jackson was up beside the pilot where he could get an eyeful of everything.

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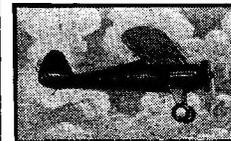
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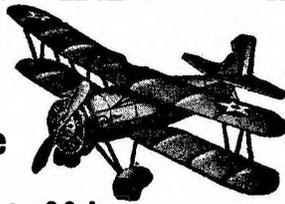
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Then we were off, and the die was cast.

Karl picked up our trail and followed a couple of hundred yards to the rear, well below our prop wash. I looked back at that grim little fighting ship, and felt chill. Those round, red, white, and blue cocardes on the wings made a guy remember things.

At that, it was odd—Karl flying an American ship, and Skeet in that German Gotha—even if it was all make believe for the movie cameras. Only in Hollywood could you find a situation as odd and bizarre as this.

ONE has time for strange thoughts in a plane. Up there between heaven and earth a man feels like a philosopher poring over a book that has all the answers in the back.

Here was Skeet and Karl, who once fought bloodily over the fields of France, and in ten years they were right back where they started, hating each other for an equally intangible reason because they were in love.

I wondered if Skeet knew that the announcement of Gretchen's engagement was a publicity yarn. Oh, well—

The cloud playground hove in sight at last. One of the camera ships began to climb, and our crate came alongside the Gotha to give a signal. It was my last close look at the job. Forty thousand dollars worth of ship that in a short while wouldn't be worth a junk man's time hauling it off.

Skeet waved rather gayly, after show-

ing back his goggles. He cupped his ear in a comical gesture when Jay Jackson put his megaphone to the open window of our bus. Excitable Jay was yelling at him, as if a director's authority should be able to carry above the roar of motors.

Jay was telling him not to forget to set off the smoke pots and start his automatic camera. Skeet didn't need to be told anything twice, and Jay knew it, but he loved to hear his own voice giving orders.

That automatic camera was one of Jay's fool ideas. It was a little box fastened in front of Skeet's cockpit and trained on him, so as to catch an angle of the fight that the camera planes, of course, couldn't shoot. When Skeet jumped he was supposed to carry it with him.

There was no dummy in the gun pit out beyond the pilot's seat. Jay figured our ships would be too far away during the scrap and final plunge to catch that omission, and of course the close-ups of the gunner had already been taken. Those shots, and any that looked likely from the automatic camera, would be spliced in with our "takes" of the battle when the film went to the cutting room.

Slowly, in wide circles, the Gotha began to climb. We followed, and saw Sammy pop out of the hole 'way back in the fuselage and wave at us. The other ship—a swell ringer for a Spad—was to follow the plunge of the Gotha. Karl had been flirting it at ten thousand feet, waiting.

But now he came swooping over us. Giving everybody a start, his speedy little ship suddenly climbed like a homesick angel. Jay shook his fist at the stunt man. He didn't like anybody to pull off a stunt if it put Jay Jackson, director, in danger of his neck. And it is a fool idea to play leapfrog over a plane.

At eight thousand feet the assistant director in our plane tossed out a smoke bomb signal. We were now level with the Gotha, and the cameras were ready with their battery of eyes.

The Spad hovered behind the bomber, then came slanting down toward its victim. A glint of sunlight, hitting the wing surface. Then the Spad sheered away and swiftly, Karl turned to pounce again on the Gotha. The bomber nosed up and into a wisp of cloud. It looked like a fish waggling sluggishly toward the surface.

I wondered what Skeet's thoughts must be as he tried to trundle that awkward boxcar away from the vicious sting of the Spad. Was he thinking—as I was—of that slashing, breathless duel back of the lines, when red flames lit the ground and a black load of death went flitting across the moon?

If Skeet's thoughts went back to that time, then he knew how Karl must have felt as he tried to escape the spattering lead of our machine guns.

SUDDENLY a black plume of smoke whipped out from the tail of the Gotha. Sammy had set the smoke pots off. Karl's ship came hurtling down in

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another attack, and then Immelmanned to return.

For a moment I forgot that Karl's ferocious charges were part of a picture; that the Gotha wasn't really on fire. It was real! It was magnificent!

The harassed bomber wavered and lost altitude. Our pilot dived, then banked slightly to leave plenty of leeway for those two ships in the camera finders. Still the Gotha clung to the battle, while with maddening persistence the Spad kept coming from behind, to swoop over the nose of the Gotha, and then spin in its tracks.

More smoke pots thickened the band of crape trailing from the doomed ship's tail. Sammy was in there, his eyes filled with smoke and his heart full of devotion. As usual, he was doing the hardest job with the least credit.

And then it happened! It's hard to describe exactly, even now, when the thing has been hashed and rehashed by a dozen witnesses.

The Spad turned on one of its charges, and headed straight back toward the Gotha. Then a white blob appeared alongside the fuselage of the bomber, and at the same moment the big ship turned and plunged directly at the oncoming Spad!

Those who didn't shut their eyes at the awful sight saw, as I did, the damndest collision that ever happened. The tiny little one-seater seemed to explode as the huge bomber smashed it.

Out of the black cloud of smoke and flame, bits of wings and hunks of metal began to drop. The flipper from the Spad danced crazily, like a bit of paper.

I heard Jay Jackson cry out: "Somebody jumped!"

Then I remembered the white splotch I'd seen. Floating back there, safe and hearty, was the man who had opened his chute and let it pull him off just before the crash.

Our pilot was diving like a fallen angel after the wreckage. The camera men ground away, eyes fixed and staring, getting the action in spite of death and destruction.

What was left of the Gotha struck in a thick clump of trees, and a geyser of black smoke and flame shot up from the spot. The Spad was scattered over three miles of sand.

We landed. One by one the men climbed out, silent. Even Jackson had nothing to say. We blew our noses to get rid of the ringing in our ears, and gazed at the smoke coming from the trees.

"Skeet didn't give Sammy a chance," said our pilot, abruptly. "He jumped while Sammy was still in there working the smoke pots."

"By the Lord, it's murder!" exploded Jackson.

We found Sammy's body—what was left of it—in the wreckage of the fuselage fifty feet from the rest of the ruin. When the rest of the boys went back to the ship, Jay rubbed the back of his hand over his eyes and swore.

"I'll railroad Skeet out of the country," he said.

The other camera ship joined our bus to try to locate Karl's body. It

wasn't recognizable when they found it.

One of the ships landed on the desert and picked up Skeet. He looked like a ghost when we saw him. I said something to him but he didn't even hear me. Just sat, holding his chute in a bundle, his face white.

Jackson said plenty. He lashed out with words that must have stung poor Skeet to the quick, for I saw him flinch, and set his teeth like a man on the operating table in a front line first aid dugout. I've been there.

The director wouldn't ride in the same plane with Skeet, and that trip home seemed endless. When we dropped down on the home port, Skeet limped off toward his car.

I LET him go. I said nothing, but the rest of the crew sounded like snakes as Skeet's name hissed back and forth. Skeet had gotten his vengeance, but he had killed Sammy in getting it—that was the burden of the song of hate on every man's lips.

It was talk you couldn't prove, though, and Skeet wasn't stopped. But if they couldn't hang a crime on him, they'd flay his hide and nail it to the wall.

The worst of it all was seeing Gretchen get the news. Because I knew her better than the others, they asked me to take her home. I helped her into my car. She didn't cry, just sat staring blankly at nothing.

Halfway through Cahuenga Pass into Hollywood, she opened her lips.

"I can't believe he'd do it. I loved Skeet, Jimmy."

That's what hurt, you see. It wasn't that Karl was dead. We mourned the death of all that we both loved in Skeet.

For a few days no work could be accomplished around the studio. The newspaper boys went into a bad frenzy over the yarn. In spite of the angles that couldn't be touched, due to the law of libel, they leaped on Skeet like hounds and shook him to bits. Here was a real tale—unrequited love, rivals who fought with the tools they used on each other in the war, sky-high action, and—hint at it, boys, but don't name it—murder!

Skeet had disappeared, and the other principals in the tragedy couldn't be interviewed, so you can imagine how close the papers stuck to the facts. But I couldn't help feeling sorry for Skeet. He was down, all right, and they didn't need to jump on him until he was nothing but a grease spot. The thing was done. I'd have seen red too, and gone off my nut.

The inspectors questioned everybody, and pawed over the wreckage. Department men scratched their heads and finally decided that the collision might have been unavoidable. Since everybody was howling for Skeet's scalp, they decided that the kid was guilty of abandoning a plane without warning the passenger. So they issued orders grounding Skeet, aforesaid order to be in effect for thirty days.

That was all of that. Officially the affair was an accident. The survivors of Sammy and Karl got their insurance, and gradually the tragedy faded from the front pages, limped a few times

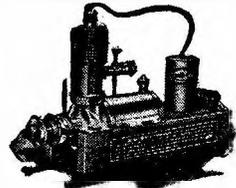
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through the second sections, and died. We changed the story so as to use the crash in the sky, and sent the film through its final stages. When the picture went out on the road a few weeks later they had to turn 'em away from the box offices. Publicity made an ordinary war picture into a regular panic.

THEN something turned up that wrote the whole history of that picture. First, Skeet broke into print again. He had bought a second hand crate and was stunting over a real estate development down in San Diego, to lure the suckers into the grasp of the high pressure boys, when his plane fell apart and let him fall.

A noon extra flashed the word. Skeet

was accommodating the papers again. He hadn't been killed. He was trying to live long enough to make another extra edition profitable. Hank Court dashed into my office with the paper, and waited until I had read the account through. It wasn't long.

I looked up at Hank, who seemed to be suffering from heart failure. He was as white as a Monday shirt.

"If Skeet dies I won't believe in nothin' no more," Hank said.

"What do you mean?" I snapped.

"I just came from the dark room," Hank said, as if his breath was choked back by something. "I've just seen the damndest thing you can imagine. Ghosts ain't in it with what I've seen, Jimmy."

I was getting jittery, watching that long drink of water trying to get out a few words you could take hold of and feel.

"What are you driving at?" I snarled. Hank got himself in hand.

"Give me time, Jim. Don't rush me, man. They've found that automatic camera that was fixed on the Gotha, just in case. It was right in the middle of some brush, a hundred feet from the wreck. And the film wasn't damaged." I felt the small hairs on my neck prickle.

"Jimmy, that film shows what really happened on the Gotha!" Hank burst out. "There's the cockpit, and Skeet, with the Spad shooting past every few moments. And that Spad was shooting real bullets!"

Since the Gotha had been previously plugged with bullet holes for movie effect, the D. of C. boys apparently hadn't bothered about that in checking the wreckage.

It was my turn to feel faint. I knew why Hank was having such a hard time trying to say something. My mouth tasted like cotton, and I could only nod.

"There's Skeet, hanging to the wheel with bullets stitching holes in the Gotha. I saw Skeet's face when he turned to call to Sammy. I never hope to see a man look like that again!"

In a minute, Hank got his nerve back again, and went on.

"And then Sammy shows. He's been hit—bad. Bullets through the fuselage, I guess, found him at the smoke pots. You can see him pointing to Skeet's chute, pulling at it, bending close to Skeet to yell with his last breath. Then Sammy slumped back. The Gotha gets mixed up in some of its own smoke, then, and the next fifty feet are a blur.

"Smoke must have fogged the lens of the camera, too, because you can only see something going on in the fuselage, and a white patch flashing out. That must have been when Skeet pulled his chute. Anyway, Jimmy, it knocks everything gallywest. Skeet rammed Karl to save his life, and then—he let us crucify him! Heaven only knows why."

"Call Gretchen," I said. "Tell her I'm stopping by in eleven minutes, and she's to be ready for the fastest trip to San Diego she ever made."

Gretchen was ready—a coat over her lounging pajamas—when my brakes burned on the asphalt in front of her apartment. On the way I told her the story.

"If we're not in time, I'll never forgive you, Jimmy," she said.

WE got there. And we got in. I wonder what the head nurse will think when she reads the papers. I told her that Gretchen was Skeet's sister.

Skeet had three broken ribs and a busted leg. The doctor said so far, so good, but a fever might indicate internal injuries. We could see him, but only for a few minutes, since his sister—

We tiptoed in. I thought he was asleep, but he must have smelled the perfume of Gretchen's hair, close beside his cheek. He looked at her, and at me, and blinked.



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"They found the automatic camera, Skeet," I said. "Come clean."

Skeet looked puzzled. Then he grabbed Gretchen by the arm.

"I forgot that thing," he gasped. "What did it show?"

"The whole story," I put in, "except how you got away in your chute. I guess that goofy Gotha-Spad stunt must have busted something in Karl's brain."

"And here I thought you loved Karl," Skeet said in a low voice to Gretchen. "Forgive me!"

Even a sap could see that he was forgiven, with a pretty girl doing the best she could against the handicap of bandages and broken ribs.

The nurse kicked me out, then, but didn't have the nerve to eject his "sister." As I say, they're going to get

a shock when they read about Skeet and his blonde visitor getting married.

I got the rest of the yarn later. Sammy had gasped to Skeet that he was done in—and then he died. So Skeet rammed his crate into Karl and cut open his chute pack. Then, because the darned, romantic fool thought that a newspaper engagement notice meant what it said, he took what followed on the button and said nothing. He thought he might break Gretchen's heart, the chump!

Well, it all worked out all right, after all, because Gretchen had her way. Skeet is no longer stunt flying. If you ask Skeet why, however, he'll tell you that it's because he doesn't think it would be right, on account of the wife and kids.

Modern Planes Album

(Continued from page 27)

engine mounting, wings, undercarriage, and rear section of the fuselage. The top and bottom is covered with dural sheet and the sides are covered with fabric panels.

The pilot is equipped with two Vickers guns and the observer has a high-

speed Lewis fitted on a rotatable mounting. Night-flying and radio equipment is carried as well as full dual controls. All controls are mounted on ball or roller bearings. The main fuel tank may be dropped at will, in case of fire.

Battle Tactics of Bombers

(Continued from page 9)

do—once the action starts!

On the other hand, it is mighty important that the heavy bomber, which costs in the neighborhood of \$100,000, is brought back safely. A victory by a single-seater over a heavy bomber is all the greater when we consider the difference in cost, the man-power destroyed, and the cost of the training of the bomber crew.

No wonder, then, that at last the gunner is coming into his own and that most of the great air powers are straining to give him the finest training, weapons, and machines possible. We predict that in the next war the aerial gunner will become the outstanding air hero and his record of the number of successful raids carried out will weigh greater than "kills" scored by the single-seat pilots.

In facing the heavy-bomber, the single-seaters and two-seat fighters are up against the true multi-gun air menace. By that we mean that the average heavy bomber carries at least four movable guns and the same number of men to man them. A glance at a modern heavy bomber shows they usually have one or more guns in the nose and one or more mounted somewhere in the fuselage with a duplex cockpit which gives the gunner a chance to fire both above and below the tail. In many foreign heavy bombers there is also a tail turret mounted well behind the rudders.

A single-seater or a two-seat fighter, attacking the multi-gun bomber usually reverses accepted tactics and attacks from below. He also plans most attacks from below. Height, in this case, means

little, and the old rule, "Always keep on top!" does not always apply where the heavy bomber is concerned. It depends, of course, on the type of ship being attacked. A smart single-seater pilot will know the weak and blind spots of his target long before he makes his attack. The bomber's real weak spot is the point under portion between the front gun and the tail-gun turret. (See first illustration.)

Tactics, then, aboard the heavy bomber, are out-and-out aerial gunnery problems.

THE bomber pilot takes his machine off loaded with "eggs." He's expected to get over his target in the shortest possible time—and get back again. Once he has left the shelter of his fighter escort, he is absolutely in the hands of his gunners. These men must get the bomber through.

In our second drawing we show the typical squadron formation used in general flight. It also shows how the gunners (particularly the rear gunners) cover each other and do not attempt to defend themselves. Here is teamwork to the nth. degree! In the case of the Squadron Vee, it is easy to see that the formation's most vulnerable spots are the two rearmost machines. But when the gunners cooperate, even these are plenty tough to "get."

Then, of course, the bombers have to consider whether they are being sent out on daylight or night raids. It is always amazing to us, incidentally, how few readers ever consider that there's a great difference between tactics and

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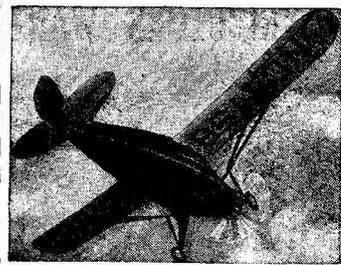
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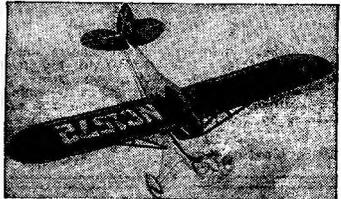
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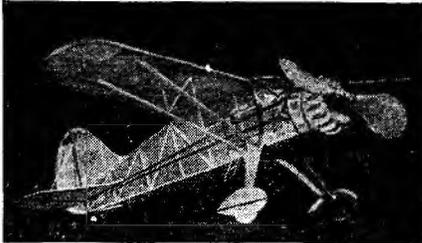
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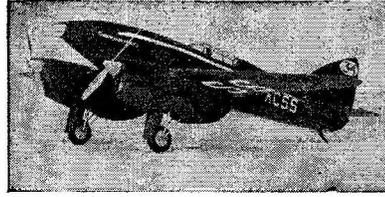
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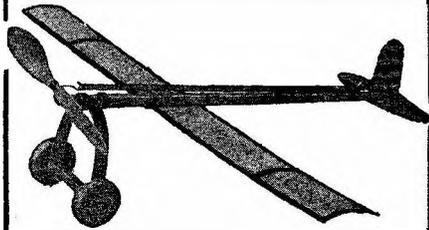
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machines of night raids and of day raids. Night raids are usually carried out by squadrons flying in in-line formations to prevent collisions and to make the raid all the more uncertain. In that way, they can at least worry the searchlight men who are trying to spot them for the fighters to pick off. And while night raiding may be safer—at least as far as anti-aircraft gunfire is concerned—the bomber gunners must always worry about the stand-by fighter pilot who no doubt has been up doing his night patrol over the important target.

The bomber gunners must pick this man out of the darkness by finding the thin pencil-like slashes of his exhaust. That's quite an order when you're partially blinded by enemy searchlights.

Today, the light high-speed cannon is revolutionizing bomber tactics. These

guns can fire graze-fuse shells at the rate of about 100 per minute; and as they far outrange the average machine gun, it will be almost impossible for pursuit ships to get anywhere near raiding bombers which carry them. Until the pursuit is equipped with a weapon that will offset this cannon advantage, the bomber will have a decided edge.

But it all goes back to the business of the gunner. He must be alert, keen, and well trained. He must know his weapon and be able to correct inevitable gun jammings quickly. He must have a dead-eye and rare courage under fire.

How would you like to be responsible for a \$100,000 bomber, the lives of possibly five men, and the success of a raid?

That's all yours once you assume command and climb into the cockpit of a heavy bomber.

Latest Reports on Transport Contest

(Continued from page 33)

take it along for use in emergencies!

The remaining Transport pictured here is a two-engined beauty right off Harold J. Dunham's model production line 'way out there near Solomon, Kansas. Listen to what Harold says:

This ship is designed for safety, having a large wing surface—so it won't let the boys down so hard. She has a blue fuselage with gold wings and stabilizer, and she's an eight-place job. Incidentally, I have more than eighty-six F. A. magazines, and I don't think there's a better magazine in the world. I'm for FLYING ACES one hundred per cent!

Thanks, Harold—and as for your Transport not letting the boys down hard, we can tell you that that's gone over big with the GHQ gang! Since your fine ship is an eight-placer, that would give us room for a lot of extra Robbies. (Ain't so, Joe?)

In conclusion, we want to say that every one of the Transport entries we've received here has proved to be an interesting original design. Nice going, all you contestants! And now let us again remind you to watch for the announcement of the winners of this contest in our next issue of FLYING ACES Magazine.

Happy Landings

(Continued from page 29)

once flew.

What is left of the one he was flying when he was shot down is in the Australian War Museum in Melbourne.

We all like this one: Unable to walk since she was three years of age, Miss Betty Snell, of London, Ontario, has just taken her private pilot's license. Great stuff, Miss Betty!

And the Hindenburg business. Do you know that another such Zep, the LZ-130, is already under construction, that

money for the third, the LZ-131, has been raised, and the Goodyear-Zeppelin Corporation, of Akron, plans to build a new American dirigible which will be 75 feet longer than the Hindenburg?

And what was that we were saying in this department last month? Well, that's life!

And finally, we wish to note the fact that Seversky has brought out a new fighter using the Wright "Cyclone" which will do 280 m.p.h. at 11,000 ft. Believe it or not!

On the Light Plane Tarmac

(Continued from page 30)

We advise this caution because the riddle of the Pou is not yet entirely solved.

Personally, we believe in the Pou. We believe it may have a few twists or faults, but none so overpowering that they cannot easily be overcome with a little study.

The trouble, as we see it, is that the Flying Flea is being rushed through a series of hurried experiments to save those who are prejudiced about its appearance rather than its actual flying

ability. We agree that it is a strange looking machine, but so was Wright's and so was Bleriot's Cross-Channel monoplane. It is, as we have pointed out so many times, the old trouble of trying to bite off too much. They want the 70 m.p.h. Flea to compete with the 120 m.p.h. Whoosis. It can't be done. If you build and fly a Pou, do not expect more than the designer promises.

Time will improve the Pou, but regular flying of it by a lot of people will do more for it than all the freak changes

and experiments the amateur designers can offer. Already, one noted British firm has improved the *Pou* to the extent of giving it a cantilever wing and a completely cowled engine, and we believe they have even gone to the point of giving the cockpit a glassed cowling. But these particular engineers have the benefit of skilled designers, wind-tunnels, and all that sort of thing, and any change they hit on will only be put into effect after test models have been tried out in the wind tunnel.

The *Pou* can't be such a bad ship when Bernard Collins—a young Englishman who had never flown before and who had but half an hour fiddling about with it on an aerodrome at Heston—actually took off for Melton Mowbray and made a perfect landing there quite safe and sound. The distance, 102 miles, was made in 1 3/4 hours at an average speed of 60 m.p.h.

Stick to the "regulations" and you'll fly safely with the *Pou*!

CANADIAN CLUBS GET FLEETS

CANADA must be a nice country to live in! We notice that the Canadian flying clubs are to get new trainers out of the \$1,262,800 appropriated for civil aviation. The Fleet Aircraft Corporation of Fort Erie gets the order. Last year, the 22 Canadian light plane

clubs flew a total of 13,819 hours. This almost reached the record figures of 1929 and 1930 when the club membership was far higher than the present total of 2,400. The 1935 clubs had 81 planes and 536 members under instruction, and 165 private pilot licenses and 33 commercial tickets were issued to flying club members. To get the full significance of this one has to remember that there are more people in the State of New York than in the whole of Canada.

SHOW AND RACE DATES

YOU light plane fans had better jot this one down in your book: The National Air Transportation Show will be held at the Grand Central Palace in New York City January 28 to February 6, 1937. The National Air races are scheduled for September 5-7, 1936 at Los Angeles.

TAYLOR AND HIS TAYLORCRAFT

C. G. TAYLOR, long connected with the Taylor Aircraft Company, manufacturers of the Taylor Cub, has left that organization and is now head of the new Taylorcraft Company which is manufacturing a new light plane which sells for \$1495 f.a.f. Butler, Pennsylvania. The Taylorcraft is powered with a Continental motor.

Citations and Awards

(Continued from page 34)

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:

- John Arnold
- George Hassen
- Edwin A. Ohler
- Anthony Buczko
- Winthrop Diford
- Roland Di Masi

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:

- Ellsworth Nelson
- Lester Schwadron
- William Gregg
- Walter Joseph

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:

- Ted C. Jack
- Earl W. Austin

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

- Adolph Betterini
- Gene Shaffer
- Alfred Costen

The following members of G-2, of the Flying Aces Club, have been awarded Aviator's Identification Bracelets for additional services to the Club:

- Charles Kandigian
- Melvin Kaplan
- Fred L. Smith
- Leo Hershkovitz
- Albert Kirschner
- W. L. Stewart
- Jos. Pospisil

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:

- Ted Koch
- Fred Allen
- Carl Scheetz
- George Hoyle, Jr.
- Douglas McBee
- Philip Gerrish
- Henry Halpern
- Larry Young, Jr.
- L. B. Sparrin, Jr.
- A. E. Karinen
- J. V. Loiacono
- R. T. Hanley
- Steve Sanchez
- Bob Pepper
- John L. Hart, Jr.
- Albert Packett

Build the Kinner Envoy

(Continued from page 44)

be put in the tip of the hardwood plug.

TAIL AND WING

THE tail is so simple to make that it needs no further directions. Note that the pieces through which the wires pass in the elevator are 1/16" by 1/8". The wing also needs no special direc-

tions. The wood sizes are given on the drawing. The wing may be traced with thin tracing paper and then reversed to obtain the shape for the left wing. Do not forget to make the two stub wings shown in Plate 4, and don't forget to tilt up the end ribs slightly. The fillets may be made according to the

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 - 1/16x3/16 for 5c
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 -32 for 5c
 - 3/8x3/8 30 for 5c
 - 3/8x3/16 15 for 5c
 - 3/8x3/8 10 for 5c
 - 3/16x3/16
 -8 for 5c
 - 1/4x1/4 6 for 5c
 - 1/16x1/2 5 for 5c
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 - 2x3 35c; 3x3 75c
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 - Silver,ea. 4c
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 - white,
 - WHEELS
 - Wood Balsa Cellu.
 - 1/2 .01 .02
 - 3/4 .02 .03 .05
 - 1 .03 .04 .07
 - 1 1/2 .04 .06 .10
 - 1 3/4 .07 .09 .15
 - 1 3/8 .07 .09 .15
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 - 3/4 x 1 x 12 3c ea.
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 - .0003x3 1/2 .ft. 1c
 - .005 in. 6x3 6c
 - .010 in. 6x3 6c
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 - 4 oz. 13c; 1/2 pt. 25c; pt. 45c.
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 - Same as clear dope
 - COLOR DOPE
 - 1 oz. 5c; 2 oz. 9c;
 - 4 oz. 17c; 1/2 pt. 35c; pt. 55c.
 - CLEAR CEMENT
 - 1 oz. 5c; 2 oz. 8c;
 - 4 oz. 15c; 1/2 pt. 30c; pt. 50c.
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 - 7/8" 6c; 8" 6c;
 - 10" 8c; 12" 10c.
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 - 1/16x3/16x15
 - DOWELS
 - 1/16x38 .doz. 5c
 - 3/8x18 2 for 3c
 - WIRE
 - 6-8-10-12-14
 -2 ft. 1c
 - WOOD VENEER PAPER
 - 20x301 for 8c
 - CELLULOID
 - 6x85c
 - 12x1618c
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 - 12" 10c; 15" 15c;
 - 24" 20c.
 - RUBBER
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 - 1/16 sq., 20 ft. 5c
 - 1/4 flat .18 ft. 5c
 - Skein50c
 - DUMMY RAD. ENGINE
 - 1 1/2" 10c; 2" d. 15c; 3" d. 20c.
 - ENGINE AND COWL ATTACHED
 - 1 1/2" dia.20c
 - 3" dia.35c
 - CELLULOID PANTS, per pair
 - 1 1/2" to 1 3/4" .18c
 - 1 3/4" to 1 7/8" .35c
 - METAL PROPELLERS
 - 2 blades 3 blades
 - 1 1/2" 3c; 1 3/4" .08
 - 2 1/2" .10c;10
 - 3 1/2" .15c;20
 - 4 1/2" .20c;25
 - ALUM. TUBING
 - 1/16 or 1/8, ft. 7c
 - ALUM. COWLINGS
 - 1 1/2" 15c; 2" 18c
 - 3" 25c
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 - 3", 12c
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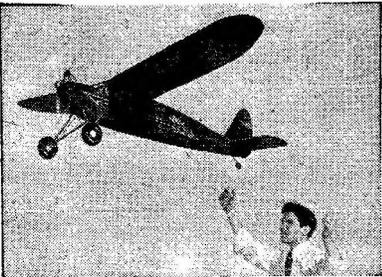
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plan. Make one left and one right of each fillet.

LANDING GEAR AND PROP

WHEEL Pants are made of three parts each, of the sizes given on plate 1. The parts are glued together and when dry, cut and sanded to shape. Make two grooves and two pin channels on each, as shown, in order to accommodate the wires. The struts are made as per Plate 2, one left and one right. They may then be glued extra well onto the pants and onto the wing. The method of making the wheels is clearly indicated on Plate 1. They are attached in place with pins. Be sure that they roll freely. The tail wheel is made of two disks of 1/16" sheet balsa laminated cross-grain. The tail wheel fork is music wire.

The propeller is cut from a block of medium hard balsa. 1" by 1 1/2" by 8" long. It is of the helical pitch type with a theoretical pitch of almost 17°. Take time in carving it. The finished hub should be reinforced with a cement skin. The free-wheeling is shown in Plate 5.

FINISHES AND ASSEMBLY

ALL exposed parts should be given a final sanding of ten-nought sandpaper. Then a coat of banana oil, then another sanding. Then a coat of good dope should be applied and a smooth glossy finish will result. It is best to paint the wooden parts after covering the model.

Now for the assembly. The rudder is glued to the body as shown. When assembling the elevator, glue in place only the trailing edge. The leading edge is left loose, although it should fit snugly against bulkhead M. This is done in order that the proper adjustments

may be made to provide a good flight. Since the wing cannot be adjusted, the elevator is the only means of effecting this. It will be found that an angle of incidence of about -2 degrees is good in most cases. This factor will, however, change with conditions such as wind, power, etc. The stub wings are glued in place against bulkheads H and I. The fillets are then glued in place, and then the main wings onto the stub wings. The cabin roof outline is obtained from the top and side views.

COVERING

IT is best to use dark tissue for the body, such as blue. The wings may then be yellow, orange, or red, and good visibility maintained. It is best to cover the body in panels using banana oil or light cement as the adhesive. The cowling is covered with stiff paper. The covered model with the exception of the cowl and landing gear is then sprayed with water and then when dry given a coat of banana oil or dope. The exposed wooden parts should now be painted. The windows should be covered with celluloid.

MISCELLANEOUS, POWER, AND FLYING

THREAD is used for rigging. Pitot tube, radiator, and wing lights may be added for realism (see plans). For propeller bearing, see Plate 5.

The power consists of a minimum of six strands of 1/8" flat rubber preferably brown, and lubricated.

After glide-testing your Envoy, wind up the model from 600 to 800 turns, stretched, of course. Adjust by regulating the incidence in the elevator according to directions under "Finishes and Assembly" above.

Now keep your eye on her!

Cuba's Waco Fighter-Bomber

(Continued from page 54)

also suggested that should a larger size model be desired, it would be to photostat the drawings to that particular dimension. In the past few years, models with wing spans ranging from twelve to fifteen inches have become increasingly popular even to the extent where model airplane firms have placed such kits on the market because of this popularity. Known as "one footers," they are just the right size to place upon the mantelpiece, radio, bookcase, or display shelf.

To insure accuracy in constructing a solid scale, it is a good policy to have thin cardboard templates made of the important parts. This is done by placing a sheet of typewriting carbon paper underneath the plan and going over the outlines with a pencil and draftsman drawing curves—if the latter are available. Go slowly but surely and you will have a perfect reproduction on the cardboard sheet below. Cut out the templates directly on the lines. Make a pattern for the top wing, bottom wing, rudder, elevator, top, and side views of the fuselage.

Start with the wings first. Use clear grained balsa. Once the wing outline is traced onto the wood use a sharp knife

or a coping saw, cutting within 1/16" of the lines. Finish by sanding. Camber the top wing first and keep the curvature all along the wing until it is ready for its final smooth sanding, then cut the wing in half. Take notice, as shown in the front view drawing, how the wing tapers suddenly at the center section. This can be imitated on your wings with the use of the knife and sandpapering. When both halves are alike cement them together, neatly raising the wings to the necessary dihedral angle.

The lower wing is made in one piece, and when completed it is divided in half.

The rudder and elevator parts are next to be cut to shape. The rudder, in the case of this ship, is built integral with the fuselage, as can be readily seen on the side view drawing. To make it easier for the model builder, the writer has added a series of dotted lines extending from the straight end of the fuselage top to the hinge line of the rudder. This serves the purpose of supplying a vertical fin. The vertical fin and the rudder may be one piece, and when attached to the fuselage with cement the separation will hardly be noticed. When the tail parts are completed, draw the

hinge lines on these surfaces with the aid of a sharp pencil point and ruler.

WHITTLING THE FUSELAGE

THE fuselage is whittled to shape after the side and top views have been traced. Start tapering the body, beginning just back of the motor cowling. The body cross-sections show that the fuselage is circular in shape at points designated C-C and takes on an elliptical shape at points D-D and E-E. Note especially the cross-section of the body at point D-D.

The cockpit should be hollowed out half the depth of the fuselage and cleaned out thoroughly with sandpapering. Build up a pair of miniature seats and cement them inside. Instrument board, dual set of joy sticks, rudder pedals, throttle, etc., may be fashioned from wood and wire and placed about the cockpits. The interior should be painted in light gray or aluminum.

The rocker arm streamlines are made individually and placed neatly around the cowling (see front view). At this time, you may also shape out the housings for the machine guns in the lower wings. Their shapes are shown clearly by the dotted lines on the lower wing. From the front view they look like little "bumps." Curve their undersides so that they fit snugly to the wings. Apply cement and press firmly. The protruding gun barrels are made from sticks of bamboo and painted black. Mark out the aileron outlines on both upper and lower wings.

The coupe top can be made to open and close if you are ingenious enough to work it out. The frames are curved to shape from little thin slivers of bamboo. The covering used is thin sheet celluloid. Study the details of this carefully.

The landing gear struts and wheel pants are made in the usual manner. Use hard balsa especially for the struts. The wheel pants are easily made if they are constructed in halves first, inserting the wheel upon its axle and "sandwiching" it between the pants halves. Study the landing gear details carefully before rigging it to the fuselage. Note how the struts are filleted to the body sides and the wheel pants. Plastic wood, bought or home made, is about the best thing to

use for fillets. Add the tail wheel.

The bomb racks are made of strips of bamboo joined together and fashioned so that they resemble as closely as possible those shown on the plans. If you feel in a belligerent mood, no doubt you'll add the two 125 lb. bombs to the racks.

The center section and wing struts are next to be fashioned. Front and side views show the center section struts. Shape each one from hard balsa and as soon as they are completed cement to the fuselage—one directly behind the other. The "N" struts are made in single pieces and joined together to the shape shown in the side view.

ASSEMBLY

YOUR model is now ready for assembly. First attach the lower wing with plenty of cement and get the correct amount of dihedral while the glue is wet. Place little prop blocks at the wing tips to hold the angle until the cement has dried thoroughly. The top wing is next cemented in position. Place the "N" struts in splayed-out effect just as soon as the top wing is resting comfortably on the center sections struts. Apply cement to all joining ends and allow time for cement to harden.

Cement the tail surfaces in position next and add the wires to the fin and stabilizer and throughout the wing rigging. Use white silk thread. The prop is shaped in the usual manner with a controllable pitch hub. Paint aluminum, drill a hole for the pin shaft, insert the pin, and mount.

THE PAINT JOB

THE paint job for the Cuban Military Waco WHD is as follows: Entire machine is painted throughout in bright aluminum. The air service insignia shown in the drawing (note the key to their respective colors) are painted on the upper surface of the top wing, the under surface of the lower wings, and on both sides of the rudder. The navigation lights on the wing tips and the top of the rudder are painted in aluminum.

The outlines of all the hinged surfaces which have already been marked out with pencil lines are given the once over with black India ink to make them more outstanding.

The Streamlined Midget

(Continued from page 51)

your streamlined Midget job with the wing right above the middle section of the body. If it stalls, push the wing back slightly, and in case it noses down, warp the stabilizer trailing edges up a little. When the glide is good, give it a

slight right rudder on the sheet aluminum, and try the model with a hundred winds. It should climb in a wide right circle to get the best results. The capacity is 450 winds with the rubber pulled out and lubricated.

The Flying Aces Stick Gas Job

(Continued from page 37)

smooth functioning of your engine.

PROPELLER

THE size of the propeller will naturally depend on the size of the engine which you use. Make your pro-

peller to the specifications of the engine manufacturer. As the ship does not require much power to fly, almost any shape propeller that your engine can turn over will keep the ship in the air. However, to obtain the most efficiency

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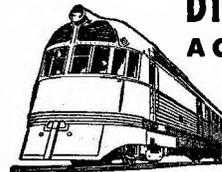
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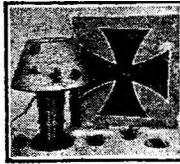
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from your plane, a propeller may be made according to the information given in your July issue of **FLYING ACES**. The speed of the plane is roughly 25 m.p.h.

FLYING INSTRUCTIONS

TWO things are necessary to obtain good flights from your model. The first is the proper adjustments, and the second is, believe it or not, self-control.

It is best to adjust the model so that it will be slightly nose heavy for the first flight. This can be done by placing the wing on the mount in such a position that the ship will balance about 1 1/2" back from the leading edge of the wing. You see, it is better to have the model glide steeply on its first flight than to have it stall and dive back into the ground. Make sure that the wing is well centered and that it is perpendicular to the center line of the plane.

Self-control only comes with experience. If possible, have an experienced gas model builder with you when you make your first flight. Select a large open field which is as far away from buildings and other obstructions as possible. Remember that a model drifts in the direction that the wind is blowing. Make sure that everything is clear in that direction.

Now put enough gas in the tank to last for about one minute. Start the motor up—but do not let it run too fast on the first flight. This is to prevent the ship from spinning with the torque. If the model goes into a steep bank, correct this on the next flight by shifting the wing area a small amount to the side of the plane which needs more lift. After the banking has been corrected, move the wing forward, a little at a time, until you get a smooth, flat glide without any stalling tendency.

After you've got in a lot of flying time, you might try building a body for your F.A. Stick Gas Job. We did that with our original ship—and the

resulting model won a contest against a slew of bigger ships.

That's all there is to it, fellows. And now, are there any questions? If so, just write the authors, care **FLYING ACES Magazine**, 67 West 44th St., New York City, enclosing a stamped, self-addressed envelope for our reply.

Answers

TO QUESTIONS ON PAGE 25

- 1—*La Desperados* was an Italian Caproni squadron commanded by Count Geleazzo Ciano, Mussolini's son-in-law, during the Ethiopian war.
- 2—Jimmy Collins was a noted test pilot who died in a crash while testing a fighting plane for the Navy. He was a great writer, too.
- 3—Rickenbacker's first victory was scored on April 29, 1918 when he and James N. Hall brought down a German Pfalz near Pont-a-Mousson. Rickenbacker actually downed the ship while Hall directed the attack.
- 4—Frank Baylies first went to France as a volunteer ambulance driver. That was in 1916. He transferred to the American Air Service when the United States went into the war.
- 5—*Rittmeister* was the unique title originally conferred upon Baron von Richthofen. It meant Commander-in-Chief—a new rank in the air service.
- 6—A Lieutenant Suk, is the only known Roumanian air ace. He is credited with seven victories.
- 7—The new Focke-Wulf with the B.M.W. engine is the standard single-seater fighter in the new German air service.
- 8—Captain McKeever was a flight commander in No. 11 Squadron, R.F.C. (he's often been mistakenly mentioned in connection with No. 22, being confused with a Captain McKelvie of that outfit.)
- 9—The prices of the light planes are: Taylor Cub, \$1,495; Porterfield, from \$1,795 to \$2,795; Taylorcraft, \$1,495; Ryan S-T, \$3,895.
- 10—Lothar von Richthofen was credited with forty victories.

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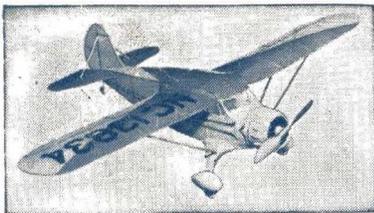
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