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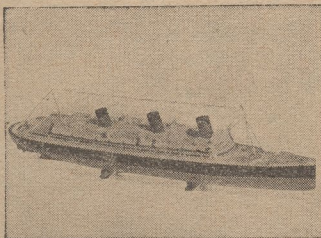


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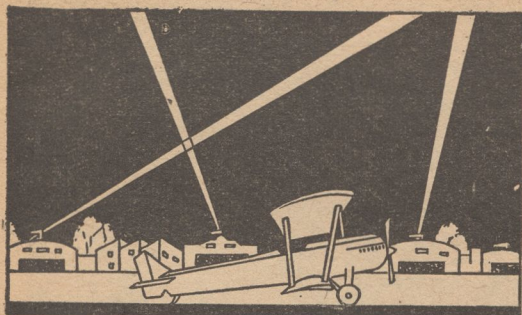
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FLYING ACES

A. A. WYN, *Editor*

VOLUME XXV

HERB POWELL, *Managing Editor*

JANUARY, 1937

NUMBER 2

EVERY STORY COMPLETE—NO SERIALS

HELL FLIES HIGH DONALD E. KEYHOE 4

The unseeing eyes of the dead stared upon Richard Knight from that hurtling Douglas

PLANES ROUT THE SALMON POACHERS EDWARD GREEN 10

How a great war ace broke the strangle hold of Canada's fish buccaneers

FLIGHT OPERA JOE ARCHIBALD 14

Phineas is made a COLONEL! And what a rip roarin' riot that started!

THE STORY OF DIVE BOMBING ROBERT FENCL 18

Striking photos and a bang-up review of our Navy's hurtling sea-strafters

RIDDLE OF THE ROCKET ARCH WHITEHOUSE 20

A “meteor” flashed across the sky—watched by keen eyes from behind a scarlet mask

IF REDS AND NAZIS CLASH 25

Death over the Gulf of Danzig—the story behind our cover painting

MODEL MAKERS' SECTION

WITH THE MODEL BUILDERS 37

MAKE THE VULTEE ATTACK WILLIAM WINTER 38

BRITAIN'S AVRO TRAINER CHRIS LESSY 44

WHY DON'T YOU FORM A GAS MODEL CLUB? PAT SWEENEY 46

TRY A SOLID MODEL PASPED SKYLARK PAUL PLECAN 49

BUILD THE F. A. FIGHTER LOUIS GARAMI 50

THIS STICK TOOK THE PRIZE! HENRY STRUCK 54

FLYING ACES MODEL LABORATORY AVRUM ZIER 56

CONSTRUCT THE “NORSEMAN” JESSE DAVIDSON 58

NEWS OF THE MODEL MEETS 61

FROM THE MODEL BUILDER'S WORKBENCH 61

DEPARTMENTS AND FEATURES

SNAPSHOTS OF THE WAR 9

WISECRACK-UPS 13

ALL QUESTIONS ANSWERED 17

NOW WE'LL ASK YOU A FEW 17

MODERN PLANES ALBUM 26

HAPPY LANDINGS 28

THE AIRMAIL PALS 29

ON THE LIGHT PLANE TARMAC 30

PILOTOPICS 31

IN OUR NEXT ISSUE 32

JOIN THE FLYING ACES CLUB 33

FLYING ACES CLUB NEWS 34

CITATIONS AND AWARDS 36

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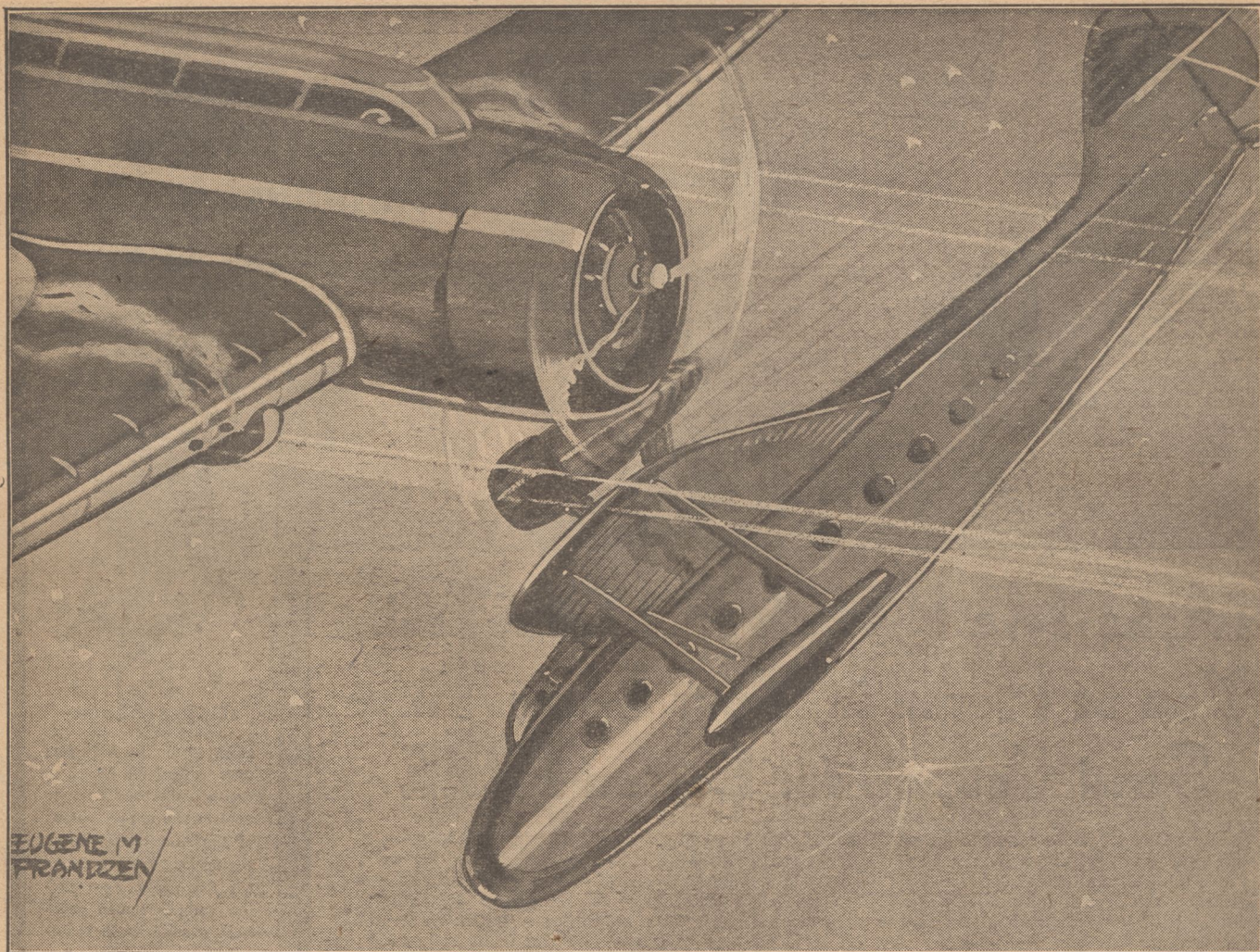
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CHAPTER I

CORPSE CARGO

By Donald E. Keyhoe

Author of "Bubbles of Doom," "Vultures of Lost Valley," etc.

THERE were three men in the car—but one of them was dead. He lay on the floor in the rear, a sinister shape beneath a heavy robe. One ghastly hand protruded from under the robe's tasseled edge, and on the swollen middle finger was a curious seal ring with a tiny, grinning skull for a crest.

The sedan moved slowly through the crowded street, its tire-chains crunching in the snow. The driver sat hunched over the wheel, his swarthy face dripping with perspiration, though the air was crisply cold. The tall man beside him had slumped far down in the seat, shielding his face with a gloved hand.

It was a face sardonically handsome, with a mockery of a mouth and black, Satanic brows. Strangest of all were the eyes beneath those brows. They were a weird golden color, and the glitter of their dark pupils was like the stare of a cobra.

The man glanced swiftly over the crowded street, without lowering his hand. It was but a few hours until Christmas Eve, and all Washington seemed to have rushed downtown for a last-minute shopping orgy.

Pedestrians began to weave through the slow-moving traffic. The driver looked back fearfully, then his face went white.

"*Kapeetahn!*" he groaned. "The corpse's hand is showing!"

Not a muscle moved in the face of the other man. Calmly, he reached back, covered the exposed hand.

"Fool!" he said in a barely audible voice. "What if one of those people had understood our language?"

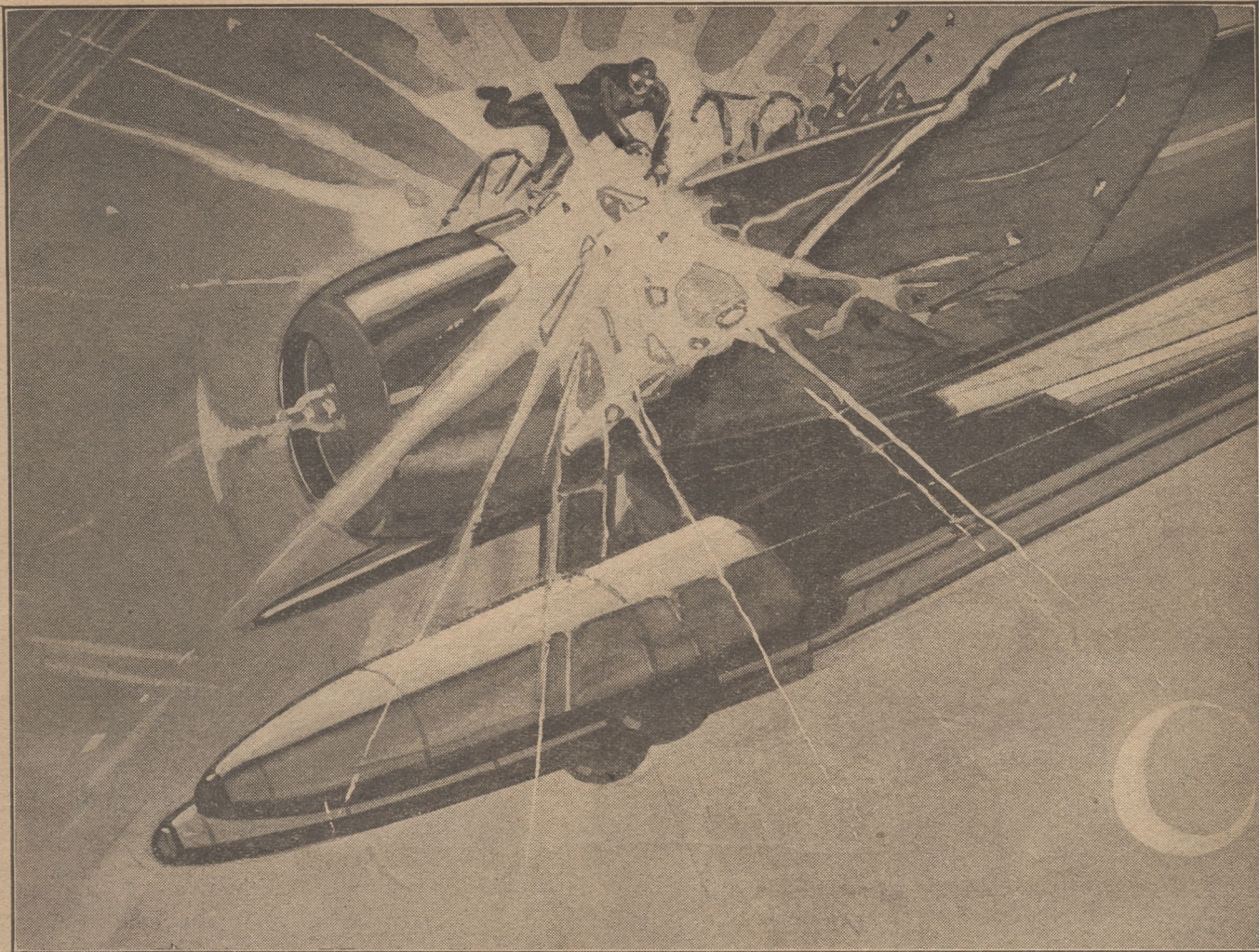
The driver quailed under the other man's look.

"I am sorry, *Kapeetahn*," he said hoarsely. "But the strain of all this—"

"And I asked for the bravest agent at the Embassy," the *Kapeetahn* interrupted with icy contempt. "Drive on—the light has changed.

The sedan crawled ahead, turned North at the Treasury. When they reached H Street, the driver swung left. He was almost to 16th Street when the lights turned red. With a muttered oath he put on the brakes. There was a sudden jarring impact from behind as another machine bumped into them. The black-browed man gazed through the rear window.

"It is only a girl," he said swiftly. "Go back, tell her it was your fault, and offer to pay for any damage."



Just as that plunging Macchi slid beneath their left wing, the sleek Seversky dropped from the heavens, its guns spewing a withering torrent. But Richard Knight's hand was already pressing his gun controls. From the wings of his speeding Northrop four weapons flamed and their pallid lightning tore across the amphibian's wing, punctured the sealed cockpit. With a terrible roar the Seversky went to pieces, hurling the wretched pilot into space amid weird plumes of fire. Death had struck in the stratosphere!

The driver wiped his sweating face, climbed out. The other car was a phaeton with its top down. The girl at the wheel made an exquisite picture. Snowflakes had powdered her furs and dotted the half-length veil which hung from her smart halo hat. As he approached, she leaned around the windshield, her red lips parted in a rueful smile.

"I am so sorry, *senor*. You see, it is that I am so new—no, I mean the automobile, it is all so new to me. If I break something, I—"

She stopped, for the sedan driver had given a start.

"What is it, *senor*? Why you look at me thees way?"

"I—it's nothing, nothing at all," the man said hastily. "I thought I knew you—but I see now I was wrong."

She gave him a level glance from her dark eyes.

"Yes, I would remember if we meet, *senor*. But your automobile, if I injure it you mus' let me pay to—"

"No, no—it's only a scratch," the swarthy man mumbled. "If you're sure your car is all right . . . ?"

He hardly waited for her answer. The light had changed, and impatient motorists were blowing

their horns. He ran back to the sedan, sent it racing into Sixteenth Street.

"Look back, *Kapeetahn*!" he said huskily. "See if she is following us."

The other man's strange eyes blazed.

"Imbecile! What have you done now?"

The driver shot a frightened glance at the rear-view mirror.

"That girl—I think she is an American agent! She may have been trailing us all the time!"

"*Na leva!* To the left!" said the senior man.

The sedan took the turn on screeching tires. The *Kapeetahn* looked back.

"We are not followed. Go slower Now, explain this, quickly!"

"This much I know," said the driver tensely, "she is the ward of General Brett, the Chief of Army Intelligence. Her name is Benita Navarre—"

"Wait," interrupted the other. "Is she the one they called the 'Girl from Lost Valley?'"

The driver nodded.

"Yes, but we've never known how much of the story was true. She's supposed to have been descended from the Grand Duke of

"Washington to Gray, Flight Eight . . . Washington to Gray . . . Report your position . . ." No sooner had that message rung across those leaden skies when just ahead of his speeding Northrop Richard Knight glimpsed a huge Douglas transport roaring through the snowy blur. And as he saw that ship he cringed. Gray had reported for the last time. For out of that craft's windows there stared dilated, terrified eyes—the unseeing eyes of the dead. And the faces from which they peered were—a hideous green!

Navarre, who fled from Spain a century ago and was trapped with his followers in a Rocky Mountain canyon when an avalanche closed the only exit. The newspaper accounts were mixed up, but General Brett stated that the Air Corps rescued the descendants of the lost community and—"

"I know the rest—and more," muttered the *Kapeetahn*. "Our agents in Japan learned the whole story. Colonel Hiroki had established a secret air base in Lost Valley, and the Air Corps destroyed it. But there is one other point. The American agent known as 'Q'—the one who wrecked our plans in China—is believed to have been responsible for Hiroki's failure. There was a rumor that he personally saved *Senorita Navarre*—"

"But that is just what I was going to tell you!" exclaimed the other man. "My assistants here in Washington have found that she has no eyes for anyone but Richard Knight, the American flying sportsman. Knight has friends in both the military and naval services . . . he used to be in the State department before he resigned and took up flying—"

"Knight—a spy!" The blaze had come back into the *Kapeetahn's* golden eyes. "Yes! It all fits—and that means he's also tricked us with that *cherf* named Doyle, the ex-Marine who flies with him most of the time. By all the devils, I'll even my score with them—when this other affair is ended."

The driver swung back toward 16th Street, still nervously scanning the mirror.

"But what of the girl? If she is brilliant enough to fit herself into modern civilization within two months, she may be in espionage. Her adoption by Brett and his wife may be only to cover up the real purpose."

But the other man shook his head.

"Spies are not made in two months; it was only a coincidence, our trails crossing like that. Calm your fears—nothing can ruin our plans now."

The driver nodded slowly, and the sedan sped on toward its destination. Once, as the car swerved, the hand of the corpse knocked against the floor, as though in grim warning of vengeance. But the cheerful crunch of the skid-chains muffled that ominous sound, and the men in front did not hear.

PAST the wing of the speeding Northrop snow drove furiously, churning a white whirlwind above the thick, transparent enclosure which covered the two cockpits. Larry Doyle scowled around his crooked nose at the storm.

"And I left Miami for this!" he snorted.

Knight grinned over his shoulder at the disgruntled ex-Marine.

"Where's your Yuletide spirit? Here we are heading for a nice, white Christmas—"

"Probably in the morgue," growled Doyle. "Just because you want to see a certain *senorita* is no reason I got to break my neck."

Knight had turned back to the controls.

"For the hundredth time, I tell you we were ordered up here. Something's happened at Washington."

"Sure something's happened," said Doyle. "Benita's been working on General Brett to get you there for Christmas. She can twist the old boy around her finger."

"This order came from Navy," snapped Knight.

"Well, you don't have to get tough about it," said

Doyle, with a snicker. He broke off as the nasal voice of an airway announcer came from the tiny amplifier under the forward cowl.

Washington to Gray . . . Washington to Gray . . . Report your position!

There was a silence, then the call was repeated. But no answer followed.

"Gray's a pilot on the East Coast Lines," offered Doyle.

"Yes, I know him," said Knight, turning the radio knob.

"He's probably set down somewhere," Doyle added. "Got more sense than certain people."

Knight listened for a second to the monotonous dot-dash buzz of a radio-beacon signal, then banked the hurtling ship. He straightened, flying east. Doyle dubiously watched the compass in the rear cockpit.

"Maybe I shouldn't mention it," he said with sarcasm, "but there's a place called the Atlantic Ocean."

Knight chuckled.

"It's full of water," said Doyle, "and it's a helluva place to land an airplane."

Knight's eyes were on the maze of instruments before him.

"Don't worry, old man. We'll pick up the center of the beam in a minute and ride it straight in."

"Yeah. Into the ground," growled Doyle. "Or maybe you forgot this bus cruises at 270 since they did her over."

Knight did not answer. In spite of his careless manner, he knew they were in a perilous position. They had made the run from Miami non-stop, and the reserve tank was getting low. He kept his eyes glued to the instruments, waiting for the change in the beacon signal.

It came—a blending of the off-course signals into long buzzes, interspersed with the identification code of the Washington station. Knight banked to hold the center of the beam. He was reaching for the microphone, to call Washington for a ceiling report, when a silvery blur loomed through the snow ahead. He jerked the throttle and hastily ruddered aside.

The blur grew swiftly into the bulk of a huge Douglas transport. Only the fact that they were flying in the same direction saved them from instant collision. Knight held his breath as the Northrop skidded aside. For a split-second he thought their wings would tangle, then the two ships slid apart. Doyle gave a sudden shout.

"Good heavens, Dick—look!"

Knight shot a hurried glance at the Douglas, then a feeling of horror came over him. One of the cabin windows was broken, and a man's head was dangling outside. Gruesome stains had darkened the side of the transport, with long, ugly streaks extending back toward the tail, where the wind had tossed the man's blood.

After that first second of nausea, Knight edged the Northrop in for a closer look. The Douglas had started to pull away because of the two-seater's reduced speed. He opened the throttle a trifle, ruddered in until he could see through the driving snow.

Some of the reading lights had been turned on in the cabin. At the window nearest the door a strangely dark face was pressed against the glass. He caught a glimpse of a hostess uniform. The girl was staring out with dilated, terrified eyes. But she did not move, and he knew that she was dead. A shiver ran over him as he saw the color of her face. It was a hideous green.

"Dead!" he heard Doyle cry hoarsely behind him. "Good lord, Dick—they're all dead!"

Knight's stunned eyes traversed the length of the cabin. Most of the passengers had slumped in their seats. At the fourth window forward, an old white-haired man had twisted around so that his face was



visible. Like that of the hostess, it was a horrible green, and his glassy eyes held the same look of terror.

THE Northrop rocked in the propeller blast of the death-ship. Knight lifted the two-seater slightly, eased the ship forward to look down into the pilots' compartment. One of the pilots had fallen sidewise in his seat. The other man was staring up sightlessly, his hands at his sides. His face, also, was that ghastly emerald hue, but Knight could recognize his features.

The buzz of the radiobeacon signal abruptly ceased, and the voice of the Washington airway announcer spoke with an anxious note—

Washington to Gray, Flight Eight . . . Washington to Gray, Flight Eight . . . Gray, report your position . . .

Knight grimly shook his head. Gray had reported for the last time.

"Take over," said Knight, looking back at Doyle. "Keep as close as you can."

Doyle dragged his eyes away from the cruising death-plane.

"Okay," he said huskily. He took the dual controls. Knight switched on his transmitter, picked up the microphone. He hesitated a second, then swung the wave-length lever to a point marked in red.

"Q to B," he said into the mike. "Q to B . . . Q to B . . . Emergency!"

He switched on the receiver. Almost at once a voice answered from the amplifier—

Received! Connecting B. Stand by!

Knight looked across at the Douglas. Doyle pointed toward a round, dark spot on the curved dural which formed the cabin roof.

"That looks like a hole burned through there. What do you think?"

"Don't know," muttered Knight. "Watch out—don't get too close."

The Northrop eased away, under Doyle's guidance, kept on a parallel path. A low-pitched, guarded voice suddenly spoke from the miniature amplifier.

B to Q. Go ahead.

Knight recognized the accents of General Brett, his main War Department contact in the hazardous game of espionage. Swiftly, he explained the gruesome discovery Doyle and he had made. When he switched back to receiving, he was startled at the tension in Brett's usually controlled voice.

It's imperative that we have a chance to examine those bodies! You say the ship is cruising on its automatic pilot?

"Yes," said Knight, "and it was evidently set after they'd picked up the beam. It's following the beam now."

No chance to put a man aboard from another ship? Brett demanded.

"It would be suicide to try it, in this storm," Knight replied. "A man would slide off before he could cut a hole in the roof or break into the pilots' compartment."

Keep the plane in sight, Brett said tautly. Follow it until its fuel runs out, and keep us informed so we can reach the wreck quickly after it crashes.

Knight switched back to his transmitter.

"Can't do it," he said. "Only about fifteen minutes' gas left. Better send a ship from Bolling Field to get on the beam and follow the Douglas. It's flying at 5100 feet, cruising speed 203, and it's directly on the beam. Our position at this moment is about fifty or sixty miles South of Washington."

I'll have a ship in the air in five minutes, Brett replied hurriedly. Keep talking at intervals, so we can check your bearing and guide the pilot to you.

"Right," answered Knight. He put down the mike, gazed back briefly at Doyle. "Notice anything queer?"

"About Brett, you mean?" said Doyle.

"Yes. He didn't give a thought to the danger of the plane's crashing in a city—all he wanted was a chance to examine those bodies."

"Not like him," muttered Doyle. He stared at the corpse-ship. "That poor devil hanging out there—there's something—" he broke off, made a strangled sound in his throat.

"What is it?" rapped Knight.

"His blood!" Doyle said thickly. "It's green!"

Knight felt an icy chill go over him, though the cockpit was artificially heated. He followed Doyle's eyes to splotches on the side of the Douglas, which at first he had thought dark red.

Doyle was right. They were the same gruesome color as the face of that dangling figure.

CHAPTER II

AGENT A-46031

"GREEN blood!" Doyle said in the same hoarse voice. "For heaven's sake, Dick—what can it mean?"

Knight silently shook his head. There was a horrible fascination about that weird-colored blood, but he forced his attention back to the task at hand. Picking up the hand-mike, he called the War Department station on his specially assigned wave-length. While Doyle flew, he kept up a steady conversation with the Intelligence operator who had first answered. After a minute or two, General Brett cut in—

Your position is 38 miles South of Bolling. We're checking from there and Arlington. An A-17 is taking off and will come in from behind you at 5,000 feet. Edge off when you see it.

"I'll do that," Knight said grimly. He turned around to Doyle. "Keep your eyes open. That ship may come barging into the beam from any direction."

The words were hardly out of his mouth when something roared above the Northrop. Doyle let out a yell.

"How the devil did they get down here that fast?"

The new arrival whirled into a vertical bank just beyond the Douglas. Knight



gave a start of amazement.

"That's not the A-17! It's a Morane-Saulnier—one of those new French fighters!"

Doyle's jaw dropped.

"A Frog ship over here? You're crazy as—"

Br-r-r-t-t-t-t-t-t! Tiny tongues of flame darted from spots in the other plane's wing. Doyle backsticked madly as tracers shot toward the Northrop. The grim-looking monoplane lanced up after them. Another blast flamed from the Chatelleraut guns mounted in its wings, then it plunged back steeply at the Douglas. As it pitched down, Knight saw the insignia on its rudder.

It was the red star of Soviet Russia!

With a swift word to Doyle, he took the controls and dived. The mystery ship was almost aligned on the Douglas when he squeezed his top stick-button. Sliding flaps shot open in his wings, and two high-speed Brownings snarled into furious song. The Morane-Saulnier leaped like a whipped horse, streaked skyward.

"Get your .50's on him!" Knight shouted back at Doyle. "I've got to keep track of the Douglas!"

Doyle seized the release-lever, and his two special

50-caliber guns jerked up from their recess aft of his pit. The single-seater was twisting back, a vague shape in the snow.

"Look out!" snapped Knight. "There's a cannon built into that engine. One shell from it, and we may be blown to pieces."

Doyle swore, and the twin .50's blazed up at the red-starred ship. The Morane-Saulnier skidded violently, dived to put the Douglas between it and the Northrop. Suddenly, it pulled out and its guns hurled a fierce torrent into the storm. Another ship had appeared—a low-wing monoplane. For an instant, Knight thought it was the A-17 from Bolling Field. Then the plane curled past in a dizzy turn and he saw what it was.

His amazement at the sight of the French-built Soviet fighter grew into stupefaction. For the second ship was a Breda assault-plane, one of the deadliest sky-weapons in the Italian Air Force!

"Am I drunk, or do you see what I see?" howled Doyle.

The answer was a venomous burst from the Breda's four Safat guns. Knight threw the Northrop onto its wingtips and cut in his wing-root .50's. The heavy guns hammered into the fuselage of the Italian fighter. The Breda pilot spun away in a lightning renverse, and his ship was instantly lost in the storm.

A shadow now flashed over the Northrop, a flitting of something gray through the snow. Engine idle, the Morane-Saulnier had seized its chance for a stealthy approach while Doyle gaped at the other ship. The Chatelleraults crashed out one quick burst, and bullets scored the long cowl in front of Knight. He had kicked away at first glimpse of that flitting shadow. But for the instinctive motion, both he and Doyle would have been finished. He plunged under the Douglas, zoomed steeply on the starboard side.

As he twisted around he saw the Breda reappear. The Italian ship was plummeting down at the cruising death-plane. A burst from its four guns ripped dural from the transport's tail. Doyle whirled his guns, crashed out a savage reply. The Breda lurched, then its nose snapped around and the raking force of its Safat battery pounded the Northrop's wing.



KNIGHT chandelled hastily, with his right wing-tip torn and gashed. The ship still answered the ailerons, but in another second it would have been too late. He heard Doyle cursing fiercely, then the quick, hard boom of the Morane-Saulnier's cannon sounded through the din.

The Douglas staggered, nosed down in a crooked dive. Knight saw the green face of the senior pilot as the transport lunged past and down. The red-starred ship was coming in for another blast at the Douglas. Knight brought the twin-Wasp to full speed, whipped around at the grim-lined raider. Flame belched from the center of the Morane-Saulnier's prop, just as he came into range. Another shell from the Hiss-cannon smoked into the falling Douglas, then a loud concussion drowned the bellowing engines.

The corpse-laden transport seemed to dissolve in a blast of fire. Hurtling pieces of wreckage flew through the snow, and the explosion tossed the Northrop upward for a hundred feet. The glare of the blast lit up the two foreign ships, and Knight saw the triumphant grin on the face of the Soviet pilot.

With a furious shove at the rudder, he swung the nose around. The man in the red-starred ship started a frantic zoom. Knight's fingers clamped hard on the .50-gun controls. Two fiery streaks drilled through the side of the other man's pit. The mouth of the stricken pilot opened in a frightful contortion, and Knight could feel the agony of that terrible, unheard scream. But there was no pity in his eyes as he saw the dying man fall.

The Morane-Saulnier whipped around in a crazy turn, then fell into a spin. Knight looked around for the Breda, but it was not to be seen. He glanced back questioningly at Doyle as he shoved the stick forward.

"Think I nicked him!" Doyle grated. "But he got away—damn him!"

Knight stared down at the spinning plane. The explosion of the Douglas had literally blasted a hole in the storm, and the heat of the flaming wreckage had opened up a space through the falling snow. He nosed down to keep the Morane-Saulnier in sight, then for the first time realized that General Brett's voice was crackling from the amplifier.

Q! Q! Q! Brett was shouting. *Why in Hades don't you answer? What's happening?*

Knight snatched at the pronged microphone, cut in the transmitter.

"Douglas shot down—blown to pieces by Morane-Saulnier with red star insignia! Italian Breda 64 also in fight. Shot down first ship. The second escaped.

An uproar came from the amplifier as he switched to receiving, then Brett's voice rose above the rest.

Q! *Don't make any other report! Make for Bolling at once . . . you can land safely . . . ceiling is about 200 . . . you'll be met there.*

"Received," Knight answered as the jumble of words ended. He switched off the generator, gazed over the nose of the Northrop. He could see the Maryland bank of the Potomac, for part of the Douglas wreckage had struck near the water and was still blazing. As he watched, the spinning Morane fighter crashed into the river with a tremendous splash. In a few moments the flames from the wreck diminished and the curtain of snow began to close in again. He leveled out at 200 feet, following the river, which showed darkly through the pelting flakes.

Six minutes later, the Northrop circled over the hangars of the Naval Air Station and then slanted down toward the Army side of the long field. Knight dropped the wheels in position, made a quick landing. As the ship stopped rolling he turned and met Doyle's eyes. Neither man spoke for a second, then Doyle drew a long breath.

"All right, you tell me—did it happen or am I nuts?"

Knight pointed out at the bullet-torn wingtip.

"But good lord!" erupted Doyle. "How could those ships get over here? What are they after?"

"One thing's plain," Knight muttered. "They were both trying to cover up the truth about the Douglas. I saw the Breda pilot fire on it a couple of times."

"But I'll swear they were firing at each other," objected Doyle.

Knight started to taxi in to the line.

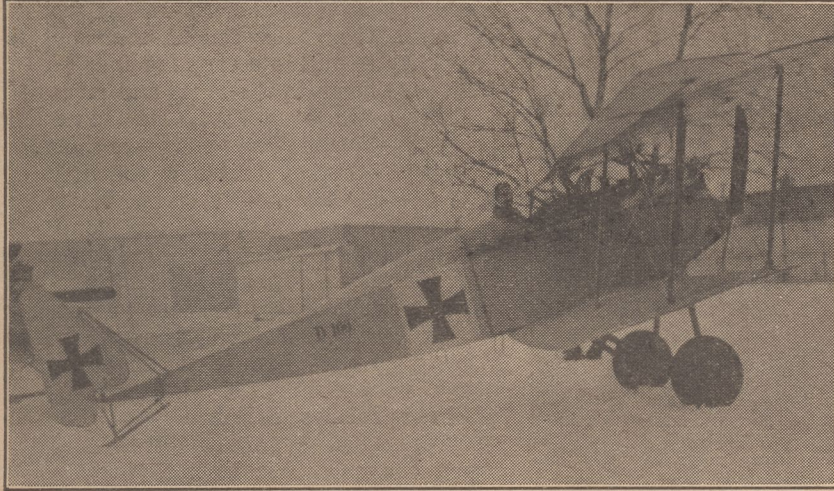
"My guess," he said, "is a secret war for some huge prize. But how they come to be in America—"

HE did not finish, for a War Department car had just braked to a stop near the line. The uniformed driver jumped down and hurried toward the Northrop. Knight nodded for Doyle to take the controls while he unlocked the special gear which held the cockpit enclosure in place. As the ship stopped, he pushed back the enclosure and stepped out.

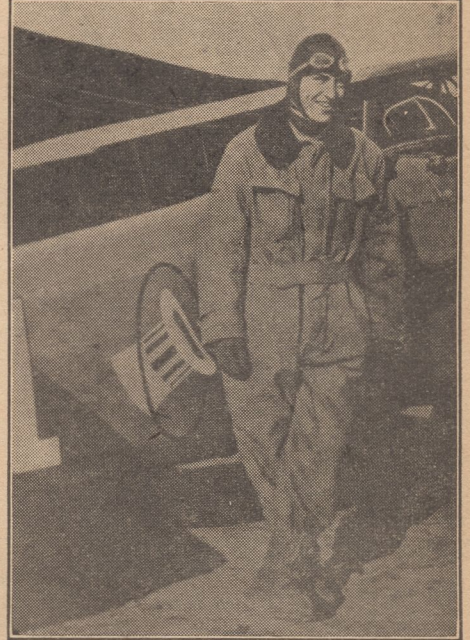
"Mr. Knight?" said the man in olive drab,

(Continued on page 62)

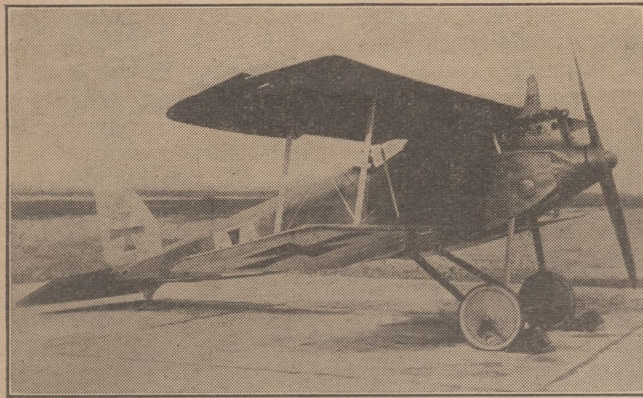
Snapshots of the War



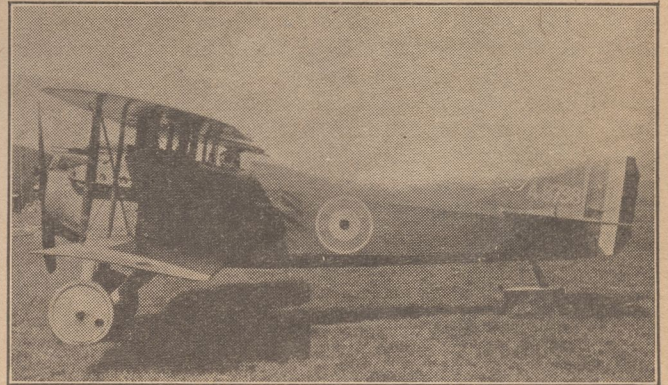
We're giving you lads a few Halberstadts this month to add to your Great War collection. First off, we shoot back to the early days of 1915 to show you this D-1 of that type, a job which carried the 130 h.p. Mercedes engine. You'll note that the pilot sat pretty high—or was he just posing for this picture? And isn't that tail assembly something to write home about? Certainly a surprising arrangement in view of present-day practice. A close study of the wings shows that they had plenty of dihedral. Well, darn well needed something when you flew in a 1915 crate, and perhaps they figured dihedral was as good as anything else.



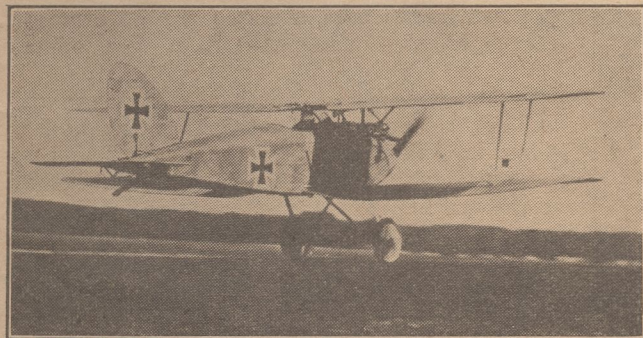
Here's one that should go great in your Hall of Air Fame. You're right—it's Eddie Rickenbacker before his pet Spad, resplendent with the 94th Squadron's renowned insignia, the Hat-In-The-Ring. Note that Eddie is wearing his old Sidcot and galoshes. Must have been winter when they snapped this one, hey Eddie? We might add that this photo has never before been published.



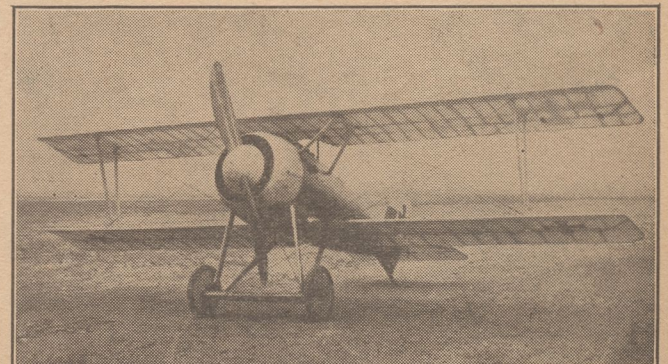
Now for another Halberstadt—the 1917 D-6 model. It used the 160 h.p. Mercedes all decked out with the famed rhino-horn exhaust which tossed the power plant's burned gases over the top wing. Of great interest in this ship are the one-piece tail-plane and elevator, and the single rudder. Apparently, they used no exterior bracing for these important members. Balanced ailerons were the order on this job, as you'll also see. Such ailerons were likewise employed on the German Albatross ships. Top speed on this D-6 was 119 m.p.h.—which was nice going for a pursuit craft back in those dark days.



You seldom hear of a British squadron using Spads. But No. 19 Squadron, R.F.C., tried them for a time, and this is one that saw such service. We think this is an unusually good side view of the famed French-built machine, for it brings out the racy "bulldog" lines of the craft. And now if you've got your December number of Flying Aces handy, take a look at the present-day Spad pictured at the top of page 26. Quite a difference, eh? (Puglisi photo.)



We've given you 1915 and 1917 model Halberstadts above, and now here we present a 1918 version of the Jerry plane. This one, snapped just as she was "settin' down" on the field, is the Halberstadt C.L.2. A 180 h.p. Mercedes powered the ship—a step-up from the 130 h.p. motor of '15 and the 160 h.p. plant of '17. According to the records, this ship was developed as a two-seater low altitude fighter; and our photo is especially interesting because it was taken during the initial flight test. Close examination, however, shows that only the pilot is in the craft—so we suppose the other pit was loaded with sand bags to make up for the accepted weight of the observer and his guns.



Better set yourself for a tongue-twister this time—for here we have the Siemens-Schuckert Kampfeinsitzer SSW.D.3. It employed the 160 h.p. Siemens-Halske radial-rotary engine. Because it never saw actual squadron service, very few records of this Heinie bus are available. We grant that it looks like a smart, high-speed job, but you can't always go by looks. There must have been something wrong with it, otherwise they would have trotted a bunch of 'em out to the Front.

Planes Rout the Salmon

By Edward Green

ON a small lake not far from the coastline of British Columbia, a keen-eyed fisheries inspector sends his tiny patrol boat alongside a big seiner. He notes there are no nets spread, but nevertheless he knows that the holds of the seine boat are packed with sockeye salmon—all poached in forbidden waters. "What are you doing here?" he demands of the seine boat skipper.

"My engine went bad and we drifted in," the skipper replies insolently.

"Well, get your boat started and get to hell out of here," the inspector snaps.

The inspector knows there is little use in further questioning. The skipper has used a time worn excuse—but it is a good excuse, even though the fish in the holds were undoubtedly poached. The nets that had taken them were illegal, but there was no positive proof that the fish had been caught in the lake or even that the nets aboard had ever been used. The inspector is beaten.

Such scenes as the above became very common a few years ago, and more than eighty patrol boats failed to make any impression on the salmon poachers who were growing in numbers. Lookouts posted at strategic points warned the poachers of the approach of the patrols. It was impossible to catch any of them in their thieving acts.

Legitimate fishermen were suffering. Where they could catch six or eight thousand fish, the poachers were trebling that number. The salmon were being depleted to an alarming extent. And worst of all, the poachers were defiantly boastful—to the point of openly flaunting the law.

Picturesque and colorful, these modern pirates cared little for common decency. They ruled the waters of British Columbia and challenged anyone to stop them.

PERHAPS it would be a good idea here to make a brief explanation about the peculiarities of salmon:

Unlike any other fish, these creatures spawn in the innumerable lakes and rivers of the rugged Western



If it wasn't for the eagle-eyed airplane patrol, this fine salmon catch wouldn't have been possible.

Coast. As soon as the spawn has evolved into fish, the young salmon start out to sea. They roam the oceans for four years, then race home to the lakes and rivers in which they were spawned. They speed unerringly—how, no one knows—to the very creeks where they first saw the light of day. Here, they spawn, then die. Fish which have been "tagged" for identification purposes in the creeks and lakes have been caught four years later in the very same lakes. During the four years they have roved all over the oceans. Some of the tagged ones have been caught as far away as the North Sea!

It now follows, of course, that if great numbers of the fish are caught before they get a chance to get back to their home lakes and rivers to spawn, the salmon

would soon become extinct. Thousands of men would then be thrown out of work, and millions of dollars invested in canneries all the way from Portland, Oregon, to as far north as Alaska, would be lost. The public, used to their favorite canned sockeye salmon would see it no more. Another of the greatest of our natural resources would become extinct.

The poachers knew the salmon runs like a book—knew exactly where fish ran the heaviest. They set their nets in long lines across the mouths of rivers and as the silver horde were brought to a stop against the nets, they dipped big scoops into the water and lifted tons of the gleaming fish aboard.

The salmon were being taken before they had a chance to spawn.

IN 1928 the salmon industry was suffering badly. Legitimate boats were making only small catches. Something had to be done. Airplanes were suggested, but the government at first was wary. Airplanes? No, that idea was "fantastic."

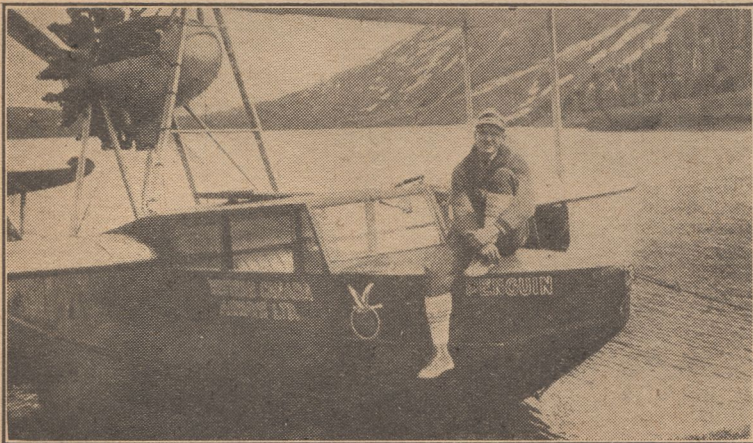
It remained for Major D. R. McLaren, one of Canada's leading World War aces, to take a hand in this great game. He was a man who had flown thousands of hours, from the red skies of war to the comparative calm of peacetimes.

As operating manager of the Pacific Coast division of the Canadian Airways, Major McLaren welcomed the chance to demonstrate what the airplane could do against poachers. And so the government finally relented and gave him the opportunity.

The major knew the poachers were tough and reckless. He knew they cared little for the law—but he had faith in his aircraft. The best airmen that Germany could produce hadn't frightened him. More than twenty of them had gone to the war pilot's Valhalla beneath his flaming guns. It wasn't likely that swash-buckling poachers could make an impression on him.

Still on his first patrol he quickly realized that the fight ahead would be no snap. And knowing that the government was loth to accept the airplane, he was faced with the job of showing them they couldn't get along without it.

As he swept into the clouding skies, he scanned the heaving wastes below. From an



Here we have the "Penguin," the Wasp-powered Boeing Totem fling boat flown on the British Columbia anti-poacher fish patrols. For this exacting work, the planes must be exceptionally sturdy. The "Penguin" is decidedly that. It's taken plenty of hard knocks—and come back for more.

Poachers •

altitude of four thousand feet he commanded a view not only of the ocean but of the many lakes and rivers close to the coastline. He could peer into the myriad bays and creeks which split the granite crags of the Coast Range. There wasn't a place where a poacher could go that Major McLaren couldn't see.

Suddenly he stiffened. Two big seine boats were in a bay. They were loading their holds with illegal fish. They were in forbidden waters. Best of all their lookout failed to notice the airplane—and so the first intimation the skipper of the seiner had of impending trouble was when the Boeing dropped into the water close at hand. A few minutes later, McLaren was aboard the seiner.

"Hand me your license," he ordered the skipper.

The big fellow looked at McLaren a moment. He saw grim determination in the major's brown eyes. He produced his fishing license. McLaren stuffed it in his pocket.

"Get out to sea," was his next order, "and bring your boats to Prince Rupert. You'll be tried before the magistrate there."

McLaren didn't see the sly grin on the skipper's bearded face. He hadn't an inkling of the state of affairs in the northern town of Prince Rupert where he had ordered the poacher.

But he was soon to learn. Despite his carefully prepared case, McLaren was astonished to hear the magistrate pronounce the poacher not guilty. It wasn't until later that he learned the magistrate was financially interested in the poacher's fishing boats!

This situation certainly put the matter in a different light. Even so, the major was quite ready to match guile with guile. He telegraphed the Canadian government at Ottawa, requested that another magistrate be appointed.

Meantime, the poacher was thoroughly enjoying the major's discomfiture. McLaren said nothing. He waited his chance.

Two days later, the same two seine boats were again in forbidden waters. Their holds were filled with fish. The lookout again failed to see the airplane until it circled overhead and landed close to the boat.

And one thing happened which passed virtually unnoticed: Major McLaren photographed the crew as they raised the nets!

This time, McLaren didn't order the skipper to take his boat into Prince Rupert. Instead he bundled the poacher aboard the seaplane and before that astonished gentleman knew what it was all about he found himself in jail.

When the case was called for trial, the poacher learned a new magistrate was on the job. The poacher's attorney battled valiantly in a packed courtroom. Hundreds of fisherman were there. The atmosphere was tense. They were watching the outcome of this trial with breathless interest. The air seemed charged with electricity when the poacher's attorney roared—

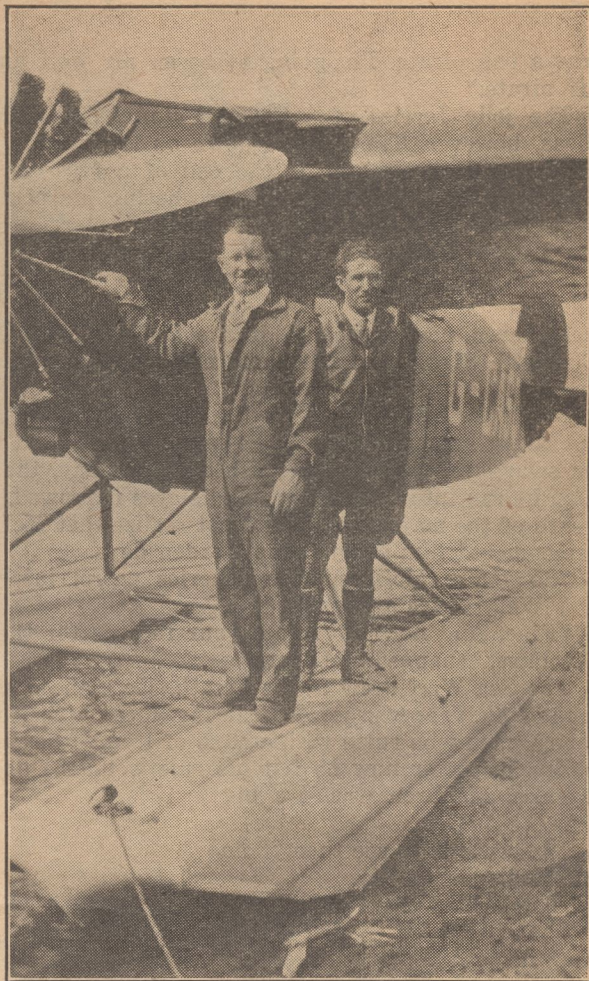
"Where is the proof that my client was fishing in forbidden waters? His engine had failed. He was blown into the lake. His catch was taken at sea."

McLaren knew the crucial moment had come. The poacher was on trial—and the airplane and its future was also on trial. He rose to his feet, handed the magistrate a set of photographs and remarked.

"There are the proofs. They are indisputable."

The attorney was unaware that

Fish pirates infested the waters of British Columbia. The salmon runs were being alarmingly depleted, and both the fish and the industry faced extinction. Then a renowned Canadian war flyer took to the air and broke the strangle hold of these modern buccaneers. How he did it is dramatically told in this fast-moving article.



Meet Major McLaren, the famed Canadian war ace who adopted Western Front tactics and plunged down from the clouds to disperse the salmon thieves. He saved this important fish industry; and now this Fokker Super-Universal patrols thousands of square miles daily to see that it stays saved. The man behind the Major is his mechanic, who's always ready to back up the flying-inspector's arguments when the poachers "get tough."

photos had been taken. He examined them, then sat down. He knew when he was licked.

"I find the defendant guilty," the magistrate intoned. "Five hundred dollars fine. And the boats will be confiscated."

An excited buzz of conversation swept through the court. The severity of the sentence had a decidedly sobering effect on those who had come to sneer; for the boats were valued at \$15,000 each.

ENCOURAGED by this signal success, the doughty major swept into the skies again and ran smack into one of the strangest experiences of his career.

He was at a spot along the British Columbia coast when an inspector told him that the greatest menace to the security of the salmon in that district was a character known as the "Sea Wolf." McLaren smiled, he was quite used to hearing these pirates class themselves as colorful buccaneers.

Yet, that self-imposed title struck a responsive chord in the major's memory. He remembered an eccentric cadet he had known during his training days at Camp Borden—a fellow who, after a few snifters of Scotch and soda, used to beat his chest and roar—

"I'm a sea wolf from the northern seas. My father was a sea wolf; he

was a fish pirate. I'm going to be an air wolf and an air pirate."

The jolly Jerries of a German *staffel* had different ideas, however. They lanced down on the would-be air pirate and strung him on the end of a few yards of Spandau nickel jackets. After crocheting his posterior with leaden stitches they whanged and larruped his crate until it almost fell apart. Still, the air pirate had a lot of luck. His wreck didn't catch fire and he wasn't killed.

McLaren now wondered if the Sea Wolf of Queen Charlotte Strait was the same man—and surprisingly enough, he was.

But times had changed for the Sea Wolf. He now was operating manager for a large cannery fleet. And when he swaggered down on the fish dock one day, the first man he ran into was McLaren. His eyes narrowed. He'd heard of the major, but he did not realize that McLaren remembered him from Camp Borden days.

"So you're McLaren, the fisheries patrol inspector, eh? Well, how's things?"

"Fine. And now let me see your records for the last few days," snapped McLaren.

The Sea Wolf drew in his breath. He glanced at the men of his fleet who were gathering about him. He was a huge man who ruled with a hand of iron. If he yielded to the inspector now he felt his rule would be broken. Besides, McLaren wasn't a big man.

"Who wants to see them?" he growled.

"I do. Hand them over."

The Sea Wolf realized this was no ordinary fisheries inspector. And after all, he had the greatest respect for a man of McLaren's caliber who had won himself a big reputation and several decorations in the bloody hell of the War. He sent one of his men for the catch records.

McLaren scanned them closely. The figures were large—too large for honest fishermen. He turned to the Sea Wolf.

"Closed season for five days," he ordered.

"For what?" the Sea Wolf roared, stepping closer.

The men on the dock tensed. Their boss was bristling. And he had cowed many a fishery inspector by his size. They watched intently, waiting for the comparatively small man who faced the Sea Wolf to back down.

But McLaren didn't back down. His voice was stern, authoritative.

"Five days," he ordered, "the season is closed to your boats for five days. Understand?"

"Try and catch me," the Sea Wolf sneered and ordered his men to their boats.

THE major said nothing. He only waited until the boats had put out. Then he stepped to his plane.

The big motor roared and the Boeing raced into the graying skies. Fog was coming in from the mountains, but McLaren was after big game and didn't heed the perils of flying blind in fog. He followed the boats to their fishing grounds. If he lost this case he would lose everything. It was a supreme test.

The Sea Wolf was astonished when the Boeing dropped

into the water beside his boat. He paced the slippery decks roaring oaths, but he made no move to interfere when McLaren stepped aboard.

"Give me your license," McLaren ordered.

Without a word the bluffing bully handed his license over. McLaren stuffed it in his pocket, went back to his plane, as the Sea Wolf watched him wonderingly. Instead of returning to his base, the major swooped down upon other poachers in the vicinity, and in a short time he brought his collection of appropriated fishing licenses to sixty. Only then did he go back to prepare the cases against the fisherman.

The cannery company, faced with the loss of sixty fishing boats, decided that a Sea Wolf was too expensive a luxury to uphold. They bowed to the dictum of the iron-nerved major and dismissed their manager. The Sea Wolf is a tabby cat now.

In less than a week, McLaren secured eight convictions against major offenders. Word sped along the coast that the new patrol was a power to be reckoned with. The smartest lookout was helpless against that all-seeing wraith which dropped from the sky. The poachers tried keeping lookouts miles away with signal fires. It was a wasted hope. The major merely changed his operating base and slashed down on them from behind mountainous peaks. The courts continued to accept photographic proof without question.

Despite this, a big Pole who operated the biggest boat on the West Coast persisted in trying his luck. The cannery company warned him. He only laughed at them—until the day the major's Boeing dropped in on him while his nets were in the water in a forbidden bay. The Pole didn't get a chance to argue. McLaren curtly ordered him aboard the plane and ran him before a magistrate.

The cannery manager came in at the trial.

"Five hundred dollars and costs," the magistrate pronounced.

"What about the boat?" the cannery manager asked.

"He can keep his boat," was the reply. "But if he's caught again he'll lose it."

"What if I don't pay the five hundred?" the nervy poacher demanded.

"Sixty days in jail. That'll keep you bottled up until the season is finished," the magistrate commented.

The Pole only laughed. "The manager here will pay the fine."

"Like hell I will," the manager snapped back, "I've warned you enough."

"There's five men aboard my boat," the poacher went on, "how about us all doing twelve days each. That makes sixty days."

"You'll get another sixty days and I'll order your boat confiscated if I hear another word out of you," the magistrate rasped curtly.

The poacher kept quiet.

MCLAREN'S success was now assured. The government decided that the airplane was the only means of controlling the poachers. And they were correct.

(Continued on page 90)



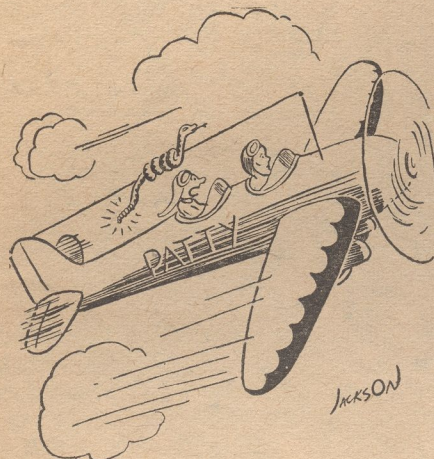
A typical fishing station on the British Columbia coast. This picture affords a vivid idea of the mountainous, wind-swept wilds which the patrol pilots face in their flights.



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 cannot be returned. Address all letters to **WISECRACK-UPS**.



"I'll be damned! It's the first time this crate's been up—and already it rattles!"

JIMINY CHRISTMAS!

Hoozie: This year, my gift to Bill Swivelpuss is going to be a parachute—and he certainly ought to break the delayed-drop record with it.

Woozie: How come?

Hoozie: Because I'm putting a tag on it, "Don't Open Until Xmas."

PHINEAS MUSTA DONE IT

Goomer: I don't see why Major Garrity is sore because the squadron paper announced he was going on a leave of absence at the end of the week.

Gillis: Oh, it wasn't just that. What made him mad was that they put it in the "Landing Field Improvements" column.

CAME INTO IT

"Wonderful invention, the airplane!"

"It certainly is. In fact I owe my entire fortune to it."

"Why, I didn't know you were in the flying game."

"I'm not—but all my relatives died in airplane crashes."

WITH the increase in the size of models and the development of the gas motor, it looks as though the model builders and not Vidal will be turning out the \$700 plane.

EASY QUESTION

Model building instructor: And now, John, when should a model be assembled?

John: After each flight.

WHAT A DOPE

Garrity: Say Phineas, what happened to your dog, Rollo? He hasn't stirred in the last two hours. Looks like a statue.

Phineas: Well, you see I spilled some fabric dope on him—and it tightened up his skin so he can't move. Haw-w-w-w!

PRECAUTION

Innocent bystander (seeing a trimotor for the first time): I notice you're not taking any chances on this trip.

Pilot: Whadya mean?

Innocent bystander: Wal, I see you've got a spare motor on each wing.

NOT THINKING OF HIMSELF

HAVING knocked off farming for a day, Hiram and Abner were out visiting the local airport. They were soon attracted by a pilot who was loudly hawking sky rides at a dollar a trip.

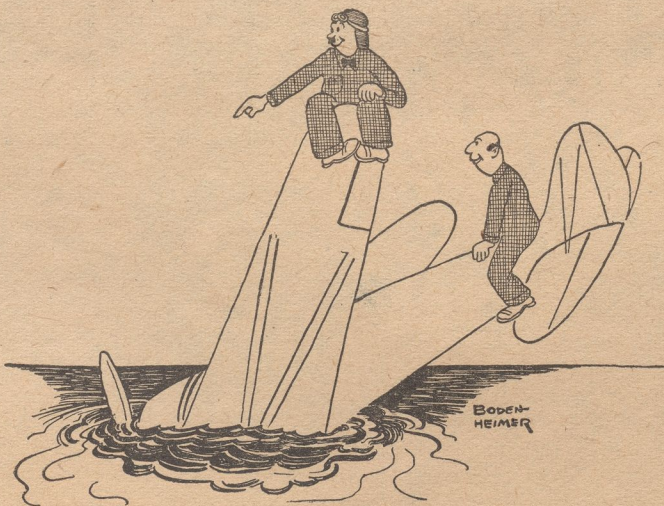
Abner: By cracky, Hiram, why don't you take one of them there rides. Course, everybody has a time to die—but 'tain't yourn.

Hiram (reflectively): Danged if what you say ain't right, Abner. But what if it turned out to be the pilot's time when I was up there with him?

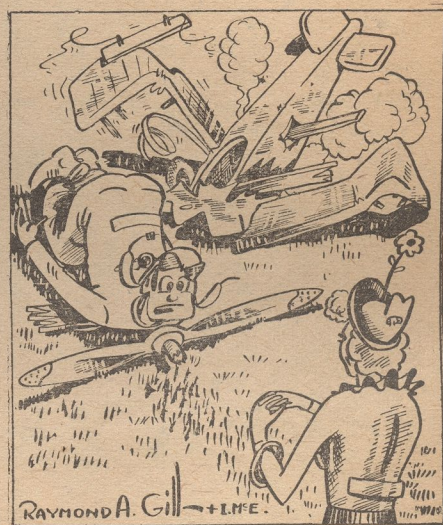
LOVE BIRD

Endurance flyer: I'll bet you don't know how it feels to be up in the clouds for days and days.

Greaseball: Oh yes I do. I was in love once.



"Naw, we don't need a sextant, Edgar. There's a melon rind. We're near Coney Island."



"Henry, darling! Where DID you get that quaint bow tie?"

CLOGGED

Mate (aboard *Hindenburg*): *Donner und Blitzen*, was ist wrong mit der ship? Der speed ve ist loosing.

Second officer (returning after inspection): *Ach du Lieber!* In der air scoop of der right motor she ist stuck ein Flying Flea!

AIR LINEAGE

Nit: My ancestors came over on the *Mayflower*.

Wit: That's nothing. My father descended from an airplane.

CAN'T FOOL HIM

Naturalist (pointing out over the sea): Look! Look! There's an Albatross!

Wartime ace: Albatross my eye! That's just a bird.

NOTHING TO WORRY ABOUT

Instructor: Good heavens, we're going to crash!

New stude (reaching for instrument board): No we won't. I'll hold the altimeter needle back.

NOT IN HER CONTRACT

Pilot (to movie star): Quick, bail out! The plane is on fire!

Movie star: I most certainly won't! Tell my double to jump for me.

Flight Opera

WITH MAESTRO PINKHAM DOUBLING IN BRASS

HISTORY'S pages show us that very strange things have happened in wars. They tell us that Hannibal pushed a big herd of pachyderms over the Alps to stomp on the Roman legions. They tell us about the wooden hobby horse that the Greeks pushed through the gate of Troy and how the faces of the Trojan boys went red when they discovered that the jokers from Athens had not come in to open a restaurant. There is the tale about George Washington crossing the Delaware when it was filled with ice cakes and how his Continentals kicked the Hessians around because they had been drinking too much New Jersey corn.

But the strangest thing that ever happened in any war took place in France in the year of our Lord Nineteen Hundred and Eighteen. Somebody made Lieutenant Phineas Pinkham a colonel!

It was appropriate that the bombshell burst on the drome of the Ninth Pursuit Squadron on the night before the Fourth. Major Garrity stood in front of the Frog farmhouse which was Squadron Headquarters. The Old Man's hands were balled into fists that looked as big as Virginia hams. Sergeant Casey could have ignited a stogey with one of the C. O.'s eyes which were raised toward the sky with a venomous light in them. That pugnacious jaw, with which the birds of Garrity's flock were only too familiar, was thrust out like a stone step in front of a red brick house.

"Skipped out on you again, did he, Howell?" he ripped into the "A" Flight foreman. "Well, I'll burn that big-eared mug's pennance when he gets down to earth this time. I'll—"

* * *

That letter the War Department tossed across the Atlantic smack onto Garrity's desk certainly had an innocent appearance. But when it was opened, the 9th Pursuit was turned upside down so fast that it looked like the 6th. For Phineas Pinkham had been made a COLONEL!

"But I hear they're goin' to promote Carbuncle," Bump Gillis cut in, "because it will save making so many medals for the bum. The Wing told Pershing that he is the outstanding—"

"Nitwit," supplied the Major belligerently. "Putting that crackpot in a brass hat's suit would be like dressing up a field mouse in a tiger's top-coat. But," he roared, "I'm in

no mood for jokes. Just wait 'til that flap-eared whatisit gets back here!"

EVEN while the Old Man was sounding off two things were coming to pass. Phineas Pinkham was on his way home from a solo jaunt over Alsace Lorraine to see if *Herr Hauptmann* von Spieler had soared into the sky again. The Kraut's ribs had had ten days in which to knit, and to the Boonetown pilot's way of thinking, the Von would lose no time in getting back upstairs to crack down on the Yank who had put him to bed.

"Well," the truant Boonetown birdman mumbled disappointedly, "I don't see the big hunk of limberger so I guess I'd better go along home an' git what is comin'. Haw-w-w-w! I wonder if I really *did* get promoted?"

As Phineas was skimming over Bar-Le-Duc a big official looking envelope was brought to the Operations office of Squadron Nine. The Old Man cast a wary eye at it, then sank down into his chair to rest his feet while he worried. His fingers were itching to rip the thing open when the sound of the Pinkham Spad bore down on the drome and deafened everyone within a mile. The Old Man tore out of his office in time to see the Boonetown joker circle the field five or six times, dive down onto a hangar, "burn" the roof with his undercarriage and zoom again. Once more he dived, his shimmering prop pointed straight at the Major. Garrity flattened himself in a hurry and realized immediately that he had ducked face first into a puddle of muddy water. He was still snorting like a person rescued from drowning after the third dunk, when Phineas sauntered toward the farmhouse as if nothing extraordinary had happened at all.

"Bong sour!" the tardy one sang out airily. "Did ya have a good trip, Major? Haw-w-w-w!"

"Did I—?" exploded the C. O. "Get in there—into that office! I'm going to bust the daylights out of you!"

"Awright, awright," the culprit sniffed. "I'm goin', ain't I? Whatcha want to aim rocks at me for?"

Inside the Major's sanctum Pinkham started talking fast to make his report before anyone else could begin to tear into him. "I did not desert



"I don't care a tinker's damn if you ARE a colonel!" Garrity yelled.

ANOTHER ROLICKING VOLLEY OF "PHINEAS" ROARS

By Joe Archibald

Author of "Scrappy Birthday," "C'est Le Ear," etc.

With Illustrations by the Author



As the hot lead zipped, Phineas took off with plenty of speed. His initial momentum carried him across the square.

Captain Howell," he declared. "Who am I to scoff at discipline? I just got into a cloud bank. And when I got out of it I was all turned around or something. There I was over the enemy coalhods and didn't even know it! That's the only thing wrong with the Pinkhams—no sense of direction. Once my Uncle Fink started out for Alaska and where do you think he landed? It'll kill you, Major! In Tahiti. Can you beat that?"

The Old Man finally found his voice and roared, "Shut up! Listen to me—if you ever get up in the sky again, it will only be from sitting on a powder dump just as a lighted lamp is tossed into it. I've had enough! I'm going to—"

"Why Major," Phineas started to protest but stopped when his eyes lit on the envelope lying on the desk before him. "Huh, is that for me? Sure—and it's from Washington. Excuse me while I read it?" And as though Garrity had been discussing the weather, he turned to the perusal of his mail. Phineas was quite as used to the C. O. boiling over as are the peasants who live on the slopes of Mt. Etna. Apoplexy threatened the Major while the hero from Boonetown gave his undivided attention to the letter.

"Uh—why look here, sir," he tossed out. "I am promoted. I am a Colonel! Oh, boys! A brass hat! Look at the signature—none other than—why, what is the

matter, Major? Are ya sick? Oh-h-h-h," and Phineas galloped out into the big room where the pilots were sampling what the mess had to offer. "Hurry," he hollered. "The Old Man has—he has passed out! Git a doctor! Git an ambulance! Hurry, somebody!"

Captain Howell and Lieutenant Gillis barged into the Operations shack. The R. O. was slapping Garrity on the chops while the Adjutant held a bottle of witch hazel under his nose.

"What did you say to him, you crackpot?" yipped Gillis.

"I just told him I was made a Colonel," Phineas gulped. "An' he fainted. Hey-ey, Bump! Why—er—Howell, now ya gotta help me pick this bum up." But it was no use. Phineas had to catch the flight leader, too, as Howell's legs turned to kite strings. "What's the matter with this flight, huh? They must've et some-thing."

Major Rufus Garrity began to come to when the miracle man from Iowa poured a shot of cognac down his and the individual throats of Messrs. Gillis and Howell.

"You'd think nobody was ever made a colonel before," the cause of it all grumbled disgustedly. "Huh, just because—"

The Old Man tried out his voice and it was as strong

as ever. "It's the first time *nobody* was made a brass hat. The Secretary of War and the President of the United States have been cheated! Did they see your picture? I'll send one to them—aw-w-w-w cripes! I am going upstairs for the rest of the week. Tell Goomer to bring me a bottle, somebody."

"Insultin' me, huh?" Phineas erupted as Captain Howell showed signs of life and Bump Gillis began to reach normal. "I am a colonel and want some respect. Oh, boys! Will I kick you ordinary Spad pushers into line! I got a lot of things to get hunk for."

"I am not going to salute you," Bump Gillis threatened. "Even if I have to go to Leavenworth for the rest of my natural life. What a *guerre*, what a *guerre*!" he sighed.

Howell looked at him and said, "Here's an aspirin, Bump."

"I need four," replied the new officer's hutmate.

THREE weeks later Colonel Phineas Pinkham arrived back on the drome of the Ninth Pursuit Squadron. He climbed out of a big official looking boiler and looked around him with a superior air. "Huh," he called to Sergeant Casey, "you're a mess, my man. Don't you ever police up? And salute when you see a superior officer!" Jauntily he walked away with an orderly stalking him. Sergeant Casey's teeth ground together and for the first time in his life he became the victim of a homicidal mania. A broad grin decorated the homely countenance of Phineas Pinkham as he bore down on the Frog farmhouse. Six pilots glowered at him—and kept their seats.

"Do you see this uniform, you bu—er—gentlemen?" the brass hat extraordinary queried. "How about standing at attention when a Colonel addresses you? Put down that firewood, Lieutenant! Assault is a serious charge. You, over there, with the twitching nose—what is your name?"

"You know damn well what it is, you—you—er—sir," Bump Gillis choked. He dropped the club just as Major Garrity strode out of his office. When the Old Man saw Phineas, he reeled around in a complete circle and staggered across the room.

"You the commanding officer here?" grunted Phineas very sternly. "Sloppy looking bunch. Ever take a bath? Look at that man near the window—a frowsy looking—"

"Why you big, flop-eared—" exploded Captain Howell.

"Have a care, Captain," growled Phineas, struggling to hold back a loud guffaw. "I will have you busted."

"I want to resign," the flight leader cracked. "Right now, too. I won't take any guff from that—"

Major Rufus Garrity walked up to Phineas, shoved his finger close to the Pinkham proboscis. "Look here, you," he bawled, "I don't care a tinker's dam if you are a brass hat and carry a cane, Pinkham. You will never be anything but a pain in the neck to me. Tell Chaumont that; I still don't believe it. After this I would not look surprised if an ostrich came in here

wearing an evening gown with a corsage of orchids. Huh! Go fly a kite, Colonel!"

"My man," harumphed Colonel Pinkham, "you must be disciplined. I will make an example of you. But now we will get down to business—that is, if you have any Spads that can get up off the ground. And by the way, Major, I don't believe you have very efficient grease mon—er—mechanics around here. Sloppy looking Spads—"

"If we hadn't had a freckle-faced nincompoop here who broke up eleven of them in one year, we might be in better shape," the Old Man thundered. "Hurry up, Pinkham, spit out what's on your mind."

"Colonel to you, sir."

"Nuts to—"

"Shut up, Gillis," Garrity clipped. "The fathead's got us where he wants us now. But if it takes me a million years, I'll get even with him."

The pride of the Pinkhams averted his head to hide a grin. Never in the course of his adventurous life had he so thoroughly enjoyed himself as he was at that moment.

"I suppose you've heard about Fraulein Satan?" he chirped. "Well, it is said that she's on this side of the lines—in this very sector. And looking for information as to how many doughs—soldiers—are going to get into the big drive. Chaumont thinks she may even be disguised as a Heinie airman. Every time you knock down one who is still breathing, I want you to make sure who he is."

"Give us the *Social Register*," Captain Howell snapped. "Or maybe it would be better if we all carried a mouse with us and if the Kraut squealed, we would know it was a dame. Should we arrest her if we find her?"

"You are very impudent," countered Phineas Pinkham loftily. "Well, I must be popping off now. Those are your orders. You know what to do. I would stay for mess but knowin' what slumgullion ordinary loeys have to eat—well, I will pass it up. Haw-w-w-w! Er—bong sour, an' don't forget what I said about discipline here as I am stickler for it."

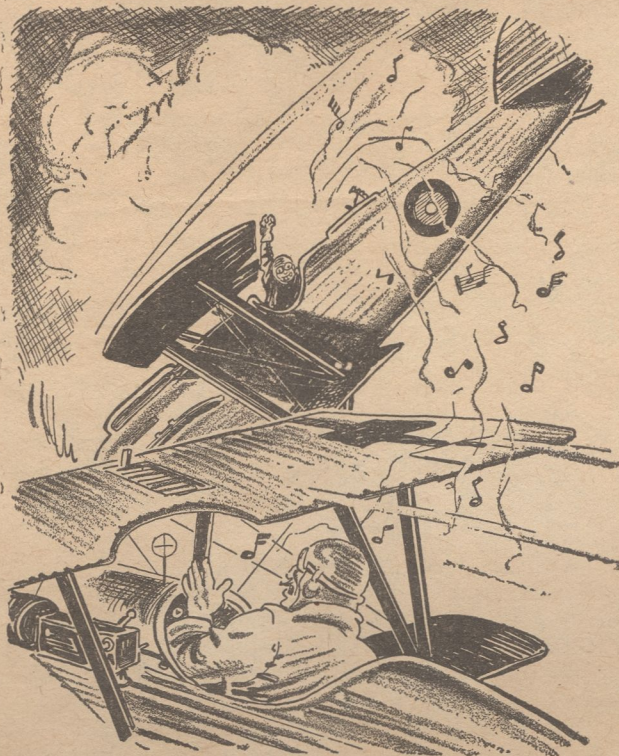
When the door had closed behind him, his ex-squadron mates looked at one another miserably.

"He carries a cane, the no-chinned hyena," sighed Bump. "If only a fairy would come along with a wand, I would ask to be made a general so I could kick that bat-eared cluck across *la belle France*!"

The Old Man just looked at him weakly, shook his head, and reeled off toward the stairs.

And five miles out on the road, Colonel Pinkham was doubled up in mirth. "Boys, I must be dreamin'," he gasped. "Did I fix those bums. Haw-w-w-w-w! I can see Bump frothing at the mouth—and the Old Man—haw-w-w-w! What a swell *guerre*! But I miss a Spad. This bein' a brass hat ain't all what it's cracked up to be."

Now Phineas Pinkham's promotion set skullduggery
(Continued on page 84)



"Nein, Nein," guttural von Schram. "Idt cannodt be.
Ach du Lieber!"

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.

Ernest George Mount, Bixby, Minn.:—We cannot take space here to go into details of the automatic variable-pitch prop, for it would require several diagrams. But we hope to run an article on this interesting bit of equipment in a future issue.

Woodbury Carter, Baltimore, Md.:—The volume entitled *The Book of the Machine Gun* may be purchased at the office of the *Infantry Journal*, 1406 East Franklin, Street, Richmond, Va. (if it is not out of print). It is a rare book today, and you may have to pay a lot of money for it.

Chester Klish, Chicago:—Your interest in the planes which have disappeared is very natural, but we have run stories on these historic events on several occasions, and once we ran a series in *Sky Birds* entitled, "Missing Ships that Came Back," a feature even more interesting. Why not write to the Menasco firm at 6714 McKinley Avenue, Los Angeles, for the other information you require?

Francis Jopp, Brooklyn:—The book *All the World's Aircraft* may be purchased at Brentano's Book Store on 5th Avenue and 48th Street, New York City. It will cost you about \$16.00.

George Patterson, Indianapolis:—The Ryan ST-models are made by the Ryan Aeronautical Company, Lindbergh Field, San Diego, California. So you like Kerry Keen better than Buzz Benson, eh? I like Phineas.

Howard Watanabe, Brigham, Utah:—There is a demand for Naval Air Reserve cadets, I believe. Dick Grace crashed planes in "Wings," "Lilac Time," "The Air Circus," "The Big Hop," and "Hell's Angels."

Bill Fahrer, Cincinnati:—I do not know who holds the outside-loop record. I do not believe a Spad could out-dive an S.E.5. The Spad would hold together, but in steep dives they usually stripped the fabric from the top wing. I saw several thus shorn in France.

Ross Smyth, Bobcaygeon, P.O. Ontario, Canada:—An international reply coupon can be obtained at any post office. It is a form of postal exchange purchased in one country and transferred to another usually for small amounts. For instance, you can purchase an international reply coupon for, say, ten cents in Canada and we can cash it in New York in American money and purchase stamps for reply postage

or anything along that line. We seem to have a lot of readers who like a lot of details about model building. Raymond Collishaw is credited with 68 victories; Barker had 53; MacLaren 54, and Nungesser 45. As for a decision on who was the greatest Ace in the war, I can see why you believe Bishop was. I personally was impressed with McCudden (I knew him quite well, also Bishop and Ball). Considering everything, however, such a choice is a personal matter. A pilot who scored ten victories in 1915 was probably as great a fighting airman as the gentleman who downed thirty in 1918, considering the difference in equipment—and the number of airmen available to shoot down. Ever figure that side of it?

Carlyle Eisenberg, Humboldt, So. Dakota:—The S.E.5 used the Hispano-Suiza motor. *Sky Birds* is no longer published. Doolittle is still alive. See picture of him in the September issue of *Flying Aces*. Pterodactyl is pronounced like "Tero-dak-Til" with the accent on the "dak." Get it? Thanks for the clippings.

Philip Hartley, Portsmouth, England:—Thanks for the details on the "Side-strand." The Curtiss Jenny was said to do 95 m.p.h., and the early Morane monoplane of 1915 is rated at 78 m.p.h. top. We shall be glad to see the photos of your models.

Raoul Graumont, New York City:—Beyond the details of the latest French machines which have appeared in our *Modern Planes Album*, I do not have anything particularly new in the way of the latest French fighters. It seems to me that they are concentrating on large bomber-fighters, such as the Farman F-221 night bomber (201 m.p.h.),

the Farman F-420 fighting bomber monoplane (217 m.p.h.), and the Breguet 460 M5 multi-seat fighter monoplane (239 m.p.h.). In the single-seat fighter class they have the Bleriot-Spad (231 m.p.h.) and the Dewoitine D-510 (250 m.p.h. at 15,900 ft.). The new Loire 46 fighter is still on the secret list, but it probably does not do more than 250. They have several models in the 230-250 m.p.h. class, but we have no record of anything that does anywhere near the 300 m.p.h.

L. A. Hornby, Manchester, England:—Yes, the mistake on the "Eagle of Lille" has been caught and corrected. A slip o' the pen. Thanks for all the clippings you sent us, but we cannot publish pictures cut from other magazines. We must have actual photographs, not copies.

Irving Gostols, Brooklyn, New York:—The book *This Flying Game* may be purchased in most New York department stores, or at Funk and Wagnalls Company, 354 Fourth Avenue, New York City. The price is \$3.00 plus eighteen cents for postage if you have it mailed.

Walter Galliford, Lakehurst, N. J.:—Thanks for your nice letter and the story on the U. S. Air Service insignia. It sounds good—but it does not check up with the actual facts.

Tony D'Martino, Brooklyn:—To draw with India ink you should use proper illustration board or a hard paper made for that sort of work. We suggest that you try a smooth finish Bristol board first. It can be purchased for about ten cents a sheet.

Edward Buitenwest, Grand Haven, Mich.:—Von Richthofen with eighty victories is believed to be the leading ace of the World War, but our Canadian friends claim that Colonel Bishop downed 125—unofficial. This argument will never be cleared up, for we understand that at least twenty-one of the eighty credited to von Richthofen cannot be accounted for in the official German Air Service records, and are only found in the records written by von Richthofen himself. We do not know anything about the armament of the New Boeing bomber—beyond the fact that four gun turrets are visible from the outside.

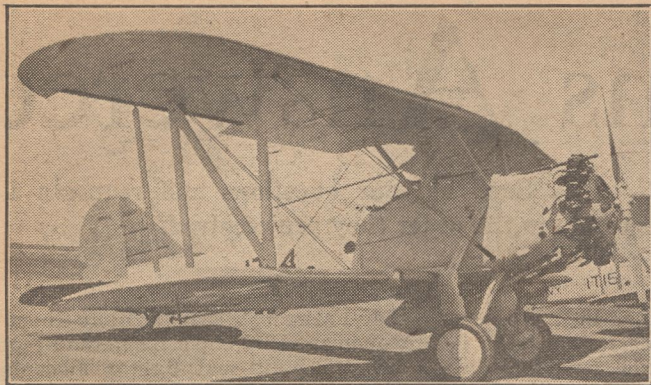
Joe W. Hilton, Wellsville, Kansas:—Gas vapor was fed to the cylinders of a rotary motor through a hollow crank-

(Continued on page 36)

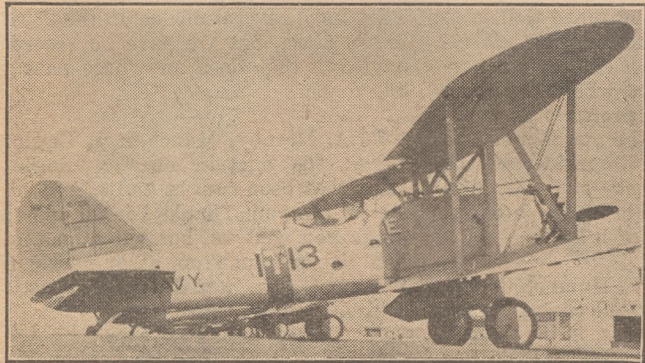
And Now We'll Ask You a Few

- 1—What is a Diesel engine?
- 2—What is the Northrop 2-E?
- 3—Who is C. W. A. Scott?
- 4—Where are the Lockheed planes made?
- 5—What new machine gun has been adopted by the British?
- 6—What are the four strokes of a four-stroke motor?
- 7—The Seversky firm has made a new type of military plane. What is it?
- 8—Who is Louise Thaden?
- 9—What single-seated plane scored more victories in the World War than any other type produced?
- 10—What is Koltchougumin?

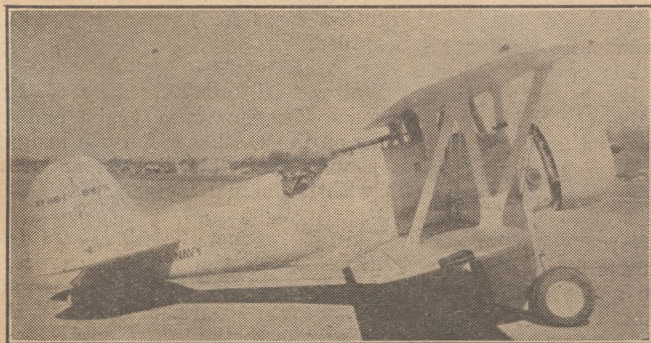
Answers on page 96



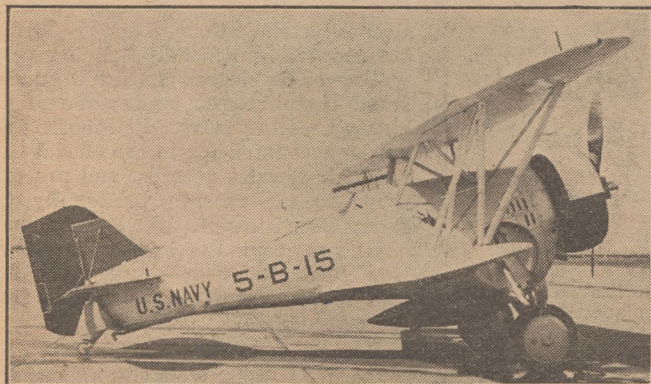
This Martin BM-1 was the first Navy plane to carry the dive-bomber designation. Powered with a 575 h.p. Cyclone, it had a top speed with full bomb load of 143 m.p.h. A development of the earlier XT5M-1, it carried a 1,000 lb. torpedo, one fixed gun forward, and two Brownings on a flexible mounting.



And here is the Martin BM-2 of which 16 were purchased in 1931. That isn't a bomb beneath the fuselage, but a 60-gal. auxiliary fuel tank which could be carried in place of a torpedo when desired. The insignia on the side of this job shows it was attached to No. 1 Torpedo Squadron.



Boeing leaped into the dive-bomber business in 1932 with this XF6B-1. It closely followed the design of the renowned F4B-4 type, the main difference being that a 700 h.p. Twin-Wasp replaced the 525 h.p. Wasp. Later the model was re-designated as the BFB-1—showing clearly why aviation editors go nuts trying to figure out which is which. (Official U.S. Navy Photo.)



Another mix-up of designations came when Curtiss broke into the game with this BF2C-1 of which 27 were bought. The plane was one of the first to feature retractable wheels. The rub is that they eventually called the craft the BFC-1, although it started out as the F11C-1. And so we're going letters-and-numbers mad—but we hope you stay with us.

The Story of

Just as America developed attack aviation, so also did she introduce that colorful, sky-plunging flying art known as dive-bombing. Herewith we present a striking photo gallery of these sea-strafting ships—and Mr. Fencel's accompanying article will tell you the dramatic story behind them.

By Robert Fencel

IT has only been in the present decade that the real dive-bomber has become an actuality, although dive-bombing as a Navy practice really began with the birth of the first real Navy plane. The first out-and-out dive bomber was built by the Glenn L. Martin company, and after its initial test, a quantity order was placed which spurred other manufacturers to take the design seriously.

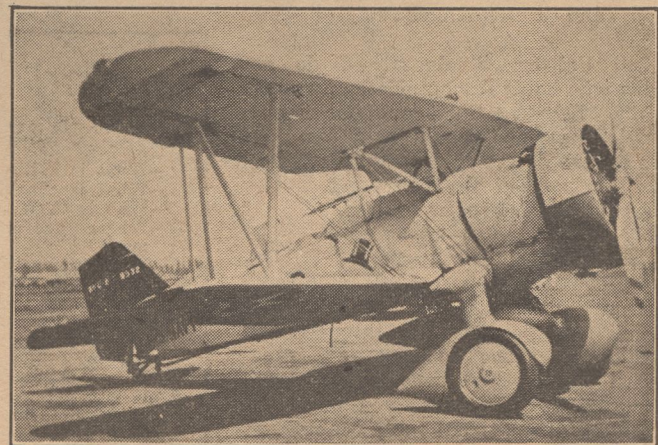
Today, the dive bomber is as much a part of Naval aviation as the fleet fighter or patrol boat.

Dive bombing was either ignored by the rest of the world for a number of years or else they sat back and let America experiment with the type. But today many fine dive bombers are to be found in the British, French, and Russian services. The British Hawker P.V.4 is a particularly fine example of this class.

The art of dive bombing first represented personal initiative rather than officially sanctioned and engineered tests by the Navy Bureau of Aeronautics. The flyers of the dive bomber above all must be very courageous gentlemen. For it requires plenty of skill and bravery to put on a sky-plunging bomb-dropping show in the face of heavy enemy gun fire.

When attacking, the dive-bomber rockets earthward—or waterward—with a bomb-load that is to be released at a *minimum* of altitude. The nearer the target, of course, the less chance of a miss.

It is proper, at this point, to take into consideration the unfavorable aspects of the dive-bomber. The foremost is the limitation in size imposed on this type of craft, and the consequent limitations of the bomb load. Owing to the stresses incurred, the Navy has decreed that the bomb-load of the heaviest dive-bombers is to be 1,000 pounds. A second point is that the upkeep of air-



Here's a High-Hat Squadron plane, another Curtiss dive-bomber. It's the BFC-2, which featured panted wheels, an auxiliary tank, and an awful lot of struts. We believe it used a 700 h.p. Cyclone and mounted two fixed guns.

Dive Bombing

craft so severely handled necessitates rapid renewal of equipment.

During the summer of 1921 the U. S. Army and Navy jointly conducted horizontal bombing tests against old German navy ships acquired through the Versailles Treaty. The reader may draw his own conclusions. The submarine *U-117* and the destroyer *G-102* were summarily sunk with 300 pound bombs. The light cruiser *Frankfurt* presented a harder problem, subsequently being sent to the bottom by 600 pound bombs. The climax came on July 21 when the *Ostfriesland*, after withstanding the punishing impacts of 230, 520, 560 and 1,100 pound bombs, was sunk by 2,000 pound bombs.

It certainly seemed that any bomb lighter than 1,100 pounds was ineffective against ships of the dreadnaught class. The 1,100 pound bombs inflicted limited damage, but did not appear to incapacitate such vessels. Of the 2,000 pound bombs, seven were dropped, the *Ostfriesland* taking her final plunge 21½ minutes after the first of the largest bombs had struck.

A GAINST this argument, however, the Navy nevertheless claimed that the 1,000 pound bomb, *effectively placed*, is sufficiently destructive to incapacitate the heaviest vessel afloat. Particularly vulnerable locations are the funnels and the water close beside the hull.

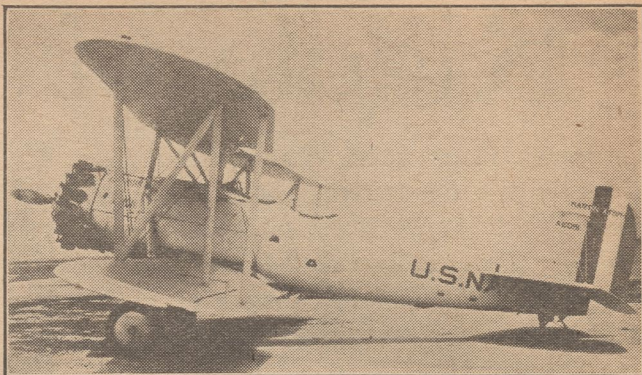
It was with the advent of the famed Curtiss XF8C-1 "Helldiver" that our Navy came to the full realization of the possibilities of a compact dive-bomber. While primarily a two-seat fighter, the "Helldiver" was chosen for dive-bombing experiments. The XF8C-1 performed admirably and was afterwards cited as "A light bomber noteworthy for its ability to dive under full power in bombing operations."

At the close of 1927, it was generally recognized that the true dive-bomber would probably supplant its established kin, the three-purpose plane of the Martin T4M-1 and Douglas T2D-1 types.

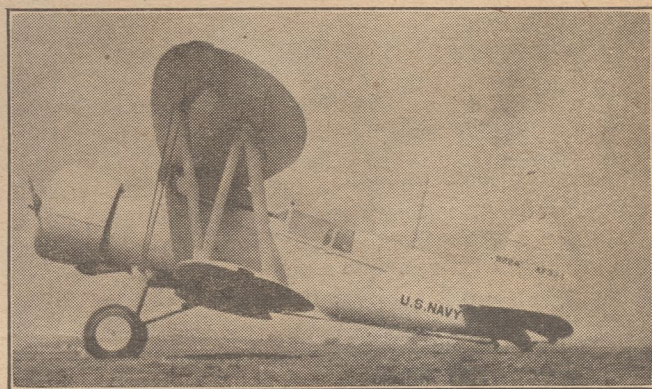
Even so, the XF8C-1, carrying a bomb of only 250 pounds weight, was obviously unable to act against large ships other than as a supplement to a more effective force.

At this stage the Bureau of Aeronautics busied itself with the design of a dive-bomber. The Bureau drafted the general design and arrangement, while the structural and detail engineering were left to the actual builder. The Glenn L. Martin Company of Baltimore, Maryland, was

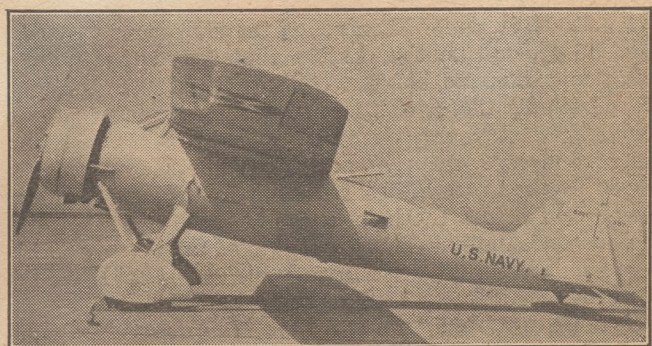
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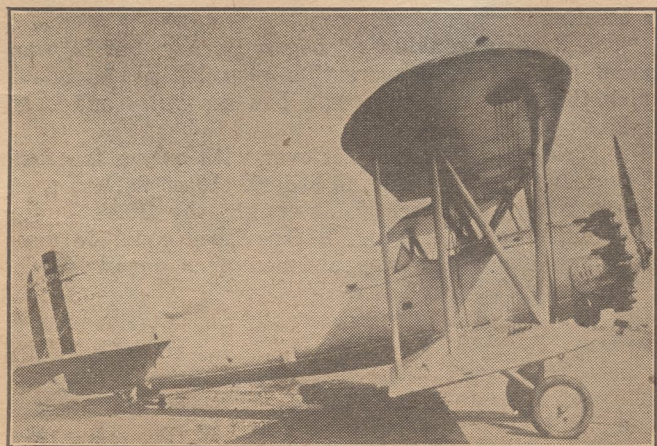
Shown above is the famed Martin XT5M-1 dive-bomber which was delivered to the Navy in 1929 after the earlier Helldiver jobs proved conclusively the value of the plunge-and-smack-'em game. A later model, the XT6M-1, followed, offering the first 1,000 lb. torpedo-carrying crutch. It was found in tests that the last named could dive 6,000 feet and pull out intact with the 1,000 lb. bomb still in the rack.
(Official U. S. Navy Photo.)



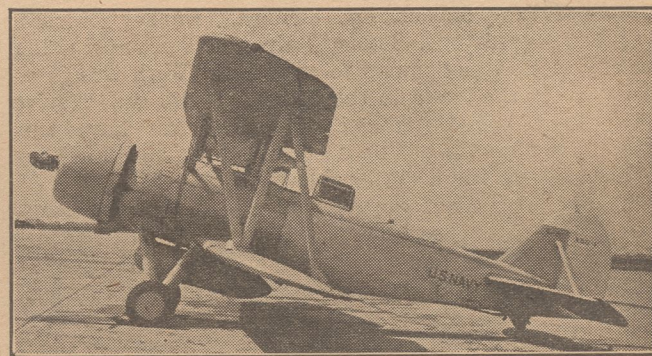
Berliner-Joyce's XF3J-1, shown above, startled the dive-bombing world in 1933—for it came out sporting the then-new Twin Wasp Jr., the unique N.A.C.A. cowling featuring adjustable flaps and thermal control, and a cockpit covered with a glass screen. The ship was a combination dive-bomber and fighter, we are told.



And now for a Consolidated "Fleetster" in Navy dress—the XBY-1 dive-bomber. This was the only job in this class of high-wing monoplane design. Though a certain amount of work was done by this model, its function was limited because of the comparatively small bomb load it could carry.



In 1930, the Navy tried its own hand at dive-bomber manufacture, and this XT2N-1, which eventually evolved into the XBN-1, was the result. No one seems to know much about it, except that it looked suspiciously like the Martin XT5M-1. The ship has since sunk into aero obscurity.



Finally we have the XBG-1 Great Lakes dive-bomber developed in 1932 and first delivered in 1933. She is a taper-wing biplane using the Twin Wasp Jr. motor. In spite of the fact that nearly four years have passed since its acceptance, this plane is generally considered the cream of the dive-bomber crop.

Riddle of the Rocket

A strange stillness pervaded the damp night air along the Connecticut shore. As time passed, that silence grew ominous. Then suddenly a weird, luminous-tailed "something" hurtled out of the curtain of mist, flashed across the murky sky, and plunged to earth beyond the strip of sand that fringed the coast. "... Only a meteor," said the morning papers. And no one questioned that explanation—no one except a man in a scarlet mask.

"THERE'S something screwy, somewhere," growled Barney O'Dare as he pressed the big black button which actuated the door of the camouflaged hangar at Graylands. "That guy Lang is up to something. He ain't quiet this long for nothing."

"I'm not worrying about Lang," Keen replied as he climbed up the pontoon of the Black Bullet. "It's that Milford *Monsoon* flying boat that has me worried."

Barney watched the doors open, saw the great steel prop slash silently as Keen applied the starter to the 1,000 h.p. Avia. The big eighteen cylinder power plant responded at once, for O'Dare had previously applied a heat-gun and warmed her from prop to carburetor gears.

He stood by while Keen rolled the ship clear, then he pressed another button that closed the great underground hangar. Outside, the layout looked simply like a well trimmed rock garden.

Barney moved swiftly then, folded down the great wings and held them in position while Keen jammed the king-pin levers down with his feet. Then silently, they rolled across the lush turf and eased down toward the water. Another lever was pulled and their sleek pontoons were sent down into position. Then Keen let her move silently out toward the open sea.

"You're not really taking that *Monsoon* thing seriously, are you?" O'Dare asked when he had made himself comfortable in the back seat.

"Scott and Lang will," replied Keen, preparing to take off.

"But I think that's a company gag—for publicity. An' as if they haven't had enough," Barney snorted.

"She's a great bus, Barney," Keen replied, now using the Gosport helmet phone to converse. "With things as they are for the trade on the trans-Atlantic run, they've got to put something out. The Germans have this catapult depot-ship business down to a science and they certainly have the dirigible business cold."

"Sure, but we got guys what have done that trans-Pacific show for nearly a year. All we need is to announce a schedule and we'll pack 'em in. Britain will be selling the *Queen Mary* for a show-boat on the Thames."

KERRY KEEN gave the Avia the gun and the Black Bullet hoiked up on her step, swished her tail, slapped at a roller, and was off. They were soon well aloft, circling for altitude over Block Island.



Keen frantically pulled at his shrouds, then raised his automatic and fired. But his weapon was as useless as a pop-gun in the face of that withering torrent of lead spewed upon him by the plunging Fokker.

"It's not that easy," Keen warned when they were at 4,000. "The real competition will come when those new Short *Empire* boats start winging across. They're real jobs, Barney, and if we are to tie up with Imperial Airways, we shall have to put out something that will compare in comfort as well as speed."

"That's an angle," agreed Barney, "but you don't really believe anyone has swiped the Milford *Monsoon* do you? What the devil could they do with it?"

"No one steals things like that just for the pleasure of stealing."

"The British wouldn't—" began Barney, but he was tossed out of the conversation play before he could finish. Keen started to speak, but his voice suddenly broke.

He jerked the Black Bullet over with only a fraction of a second to spare just as a dark object flashed past with a roar. The swirl of air caught the Black Bullet dead under her port wing. Before Keen could do anything the monoplane was swished over on her back.

"Watch that!" screamed Keen.

"I am," yelled Barney, scrambling about somewhere behind.

Keen had to let the Bullet fall away, and she lost plenty of altitude doing it. They fluttered and stalled, then finally Keen managed to pull her clear and ease her into a gentle dive from which she recovered with a tremble.

"What was that?" yelled Keen again.

ANOTHER THRILLING "KERRY KEEN" MYSTERY NOVELET

By Arch Whitehouse

Author of "Wings of the Viper," "Sea Hangar Snare," etc.

Illustrated by Alden McWilliams



"Cripes! I don't know. Looked like that guy in the Twenty-fifth Century. What's his name?"

"Stop gagging! What was that?"

"Something without wings, or I'm a Dutchman," Barney said hollowly.

"Have you been drinking again?"

"Not much. But you can say what you like—whatever that thing was it didn't have wings and it certainly was going like a bat out of hell."

"A rocket?" said Keen giving the Bullet the gun and

heading speedily toward the Connecticut shore.

"Yeh, but there ain't any such thing—yet," Barney said.

"Hello! . . . Look! . . . Over there toward Black Point!" Keen cried. On the Connecticut shore ahead, they saw a sudden belch of flame. It looked like an explosion of some kind.

Keen turned, stared at Barney. "Did you see that?" he demanded. "Did that . . . that rocket thing head that way?"

"That's the way she was going," agreed Barney. "Funny, though—explosion, but no concussion. We should have heard or felt it by now."

"That's right," agreed Keen. "I'm going over that way and see what that was."

"You'll get nabbed, too. There'll be half a dozen Coast Guard tubs in the area in no time."

"I'll risk it," grinned Keen. "I'll run them ragged."

KEEN settled back, watched the plume of flame that had risen from a point about three miles southwest of Niantic. If that rocket—if it *was* a rocket—had hit there, it had been directed on the promontory known as Black Point, a colorless finger of land about a mile long and no more than a quarter of a mile wide. He reflected that if that "rocket" had been directed there, it had been dispatched by someone who certainly knew plenty about rockets.

As they raced on, Keen tried to rack his brain for anything that might give him a clue. He mulled over all the articles and books he had read on rockets, but could recall nothing equal to this. If it had come from anywhere within the area where they had first seen it, it must have travelled at least twenty miles to get to Black Point.

But a new glint caught his eye. The glare of the flame on Black Point had died down suddenly; and his vision now made out two glints of pennon-shaped flame hurtling toward them. Barney let out a yell, slapped Keen on the back.

It was a gray bullet-nosed biplane packed with plenty of "swift." It came on, glinting out of the two exhaust-ports—and then it added two more twinklers. The extra eyes were the spitting barrels of two machine guns set in the nose and firing through the airscrew.

The Black Bullet slammed into this storm, and Keen instinctively pressed his own trigger releases.

"What the devil sort of a bus is that?" yelled Barney.

"British 'Kestrel' engine, anyway," yelled Keen, holding his course.

The gray biplane whipped up, unable to hang on any longer. Keen drew his stick back slightly and let loose with the Chatelleraults fitted in the wings. Barney was ready, too, and as the gray raider swept over them he crouched under the grips of his Browning guns, let fly with everything.

The biplane wavered, staggered, then there came a metallic scream. That was the prop breaking up, ripping the motor out of the bearers. She rolled over, and Barney planted another wicked burst smack in her side as she started to boot-lace down. Keen rolled over fast as the raider fell into a sleazy twisting spin. They curled around and watched her, followed down carefully until she hit.

"What was it?" asked Barney.

"A Dutch Fokker fighter—C.X. type. A pip, too. They have daubed her all over with gray paint and blanked the insignia out. I'm going down to have a look-see."

Keen steadied his glide and let the pontoons down. He saw the wreckage of the Dutch Fokker bobbing helplessly below. They skirted her for a minute, then the Black Bullet dropped down beautifully and Keen taxied her in toward the wreckage. Barney stood up, kept a close watch on everything while Keen clambered out on the pontoon. He took a light line across and clambered along the wrenched wing of the gray Fokker.

"Make it snappy," warned Barney, the night glasses up to his eyes. "I can see a cutter heading this way."

"I'll be back," Keen cried, crawling to the cockpit hatch and ripping it back.

He found the pilot huddled over his belt. There was no one in the back seat. Keen fumbled fast, removed everything loose, then made a last hurried search through the dead man's pockets. He came away with a few letters, a leather pocketbook, a water-soaked map, and a small blue leather booklet. These he stuffed inside his coverall pockets and hurriedly returned to the Bullet.

He just had time to get aboard, let the Bullet ride clear, and head off. For not three cables' length away rode a Coast Guard cutter. There was a flash. Something crashed out over the cockpit hatch and made Keen move fast.

"Only the Coast Guard," snorted Barney. "They fire about five over to let you know they're coming. Then they try to hit you. Let's go!"

The Black Bullet, responding to the throttle, slammed across the rollers. With a flip of the stick she hoiked up and cleared. Keen held her down near the water and raced away toward Montauk light, zig-zagging all the way until the Coast Guard gave up the chase.

Barney was still fumbling with the stuff Keen had hurriedly handed him, trying to figure out what it was. There was a strange steel box from which emerged two heavy duty cables with quick release lugs on the ends. From it there also protruded three bright steel bars. The sides were dotted with bright-headed screws indicating that there was considerable intricate mechanism inside. It was all pretty puzzling to Barney and he put it down gingerly.

They climbed away, went out to sea for a short distance while Keen went over the unusual events of the evening. Then, as suddenly as he had started, Keen decided to return to Graylands.

Barney had sense enough not to ask questions.

The Bullet, silenced now, was brought down again, run gently up out of the water and into the arbor shelter while Barney opened the doors. Keen ran the ship in after the wings had been folded up and without a word, gathered up all the salvage and sauntered through the hangar, on through the wine-cellar, and up into the ground floor of his home. He slipped out of the black coverall and parachute harness, flipped off his mask and goggles, and wandered along with his plunder to his great study.

Barney came up in a few minutes with a bottle of Bollinger '28 under one arm and a stubby brown bottle of O'Doul's Dew under the other.

"Quite an evening," was all that Keen said when he raised his champagne glass.

"Well, we tested our new guns," grinned Barney, "An' that's what we went out for."

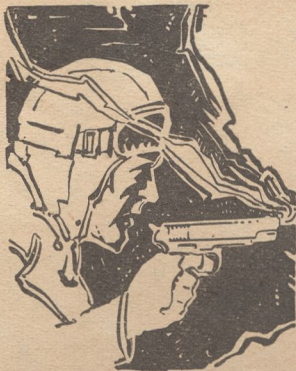
THE clock on John Scott's desk disclosed that the New York Secret Service chief was half an hour later than usual. It was 9:30 a. m.

But he'd not enjoyed the extra thirty minutes. It had produced no rest. For the first time in his life he really missed his side-kick, Drury Lang.

He stared at the clock, then at his watch as if he could not believe his eyes. There was no sign of Lang anywhere. No scrawled notes on his desk. Nothing stuck under the telephone. Nothing folded and slipped into the leaves of the World Almanac which always rested on Scott's desk.

Scott stood in the middle of the floor, stared around. But there was no answer to his silent plea. "Gone since Monday," he muttered again for the tenth time.

He let his eyes rest on the telephone; then, like all men of his tribe, adopted the suggestion and took up



the receiver. He was about to fumble for a number he had scrawled on the corner of his desk blotter when a voice caught his ear—

Scott!

The Secret Service man jerked the receiver away from his ear as though he half expected it to explode against his head. His right hand automatically reached for his shoulder holster. But the voice in the phone persisted—

Scott! Listen to me, Scott. This is important . . . and get it straight!

"Who is this?" asked Scott, still puzzled.

You tell Lang to keep out of that Old Lyme affair, or he'll get his brains blown out.

"Who is this?" demanded Scott, enraged.

The Griffon!

"The who?" Scott floundered, almost biting his lip. But there was only a strange click and the voice was gone.

Scott pounded the bar of his telephone set, got the operator. "Get this," he stormed. "This is a G-2 call. I want the location of that call you just put through to me."

"Call? . . . You have received no call," the operator answered. "Are you sure?"

"Sure? Certainly I'm sure! I was just talking to a man who called himself— Oh, never mind," snarled Scott slamming the receiver down.

He sat down, stared across his desk at the map on the wall. Then he picked up the telephone again and started to call a number. Just then the door opened and Kerry Keen, the noted ballistics expert, sauntered in, trim and immaculate.

Scott set the telephone set down gently this time. "That's funny," he said. "I was just going to call you."

"Who shot who, and where?" beamed Keen, taking the best seat in the office.

"I just had the Griffon on the wire," said Scott slowly.

"Impossible," grinned Keen. "I just got off the top of a Fifth Avenue bus."

"No kidding Keen," Scott said anxiously. "I was actually speaking to him."

"Then I'm not the Griffon, this week, eh?" said Keen taking out a gold cigarette case. "I wish you'd get my status straightened out."

"Stop gagging. This is serious. I just picked up my phone to call you—"

"And there was the Griffon on the wire, I suppose," interrupted Keen with glee.

"That's right. How did you know?"

"I guessed it. You look as though you'd had some bad news. Besides, you told me when I came in."

"Let me talk for a change, will you?" growled Scott selecting a cigar half as big as a ferry slip pile. "This guy, the Griffon, was on the wire and told me to keep Lang off the Old Lyme business—or he'd 'get his brains blown out.'"

"Poor old Lang," said Keen with mock severity. "Still, it's an idea if you ever want to get rid of him."

"Shut up!" bellowed Scott. "Lang has been on the Old Lyme business since Monday, and I've had no news from him since he started. How do you like that?"

"Let's go out and celebrate!" cheered Keen.

"I'll brain you, Keen!" roared Scott. "Lang's missing, I tell you—on a smuggling show. And it's no joke. That's why I was about to call you."

"And got the Griffon, instead," laughed Keen, enjoying Scott's discomfiture. "What is this Old Lyme business, anyway?"

"Well, for about two months there's been a ton of ice slipping in somehow, and we've traced a lot of it to an old wharf on the outskirts of Old Lyme."

"Ice?" said Keen puzzled.

"Yes ice—diamonds," explained Scott, disgusted at Keen's apparent lack of criminal education. "Someone's been smuggling diamonds by the bushel into Connecticut, and Lang went up to look into it."

"And hasn't returned?"

"Not a word. And he was supposed to report every twelve hours."

"*Cherchez la femme*," Keen smiled. "Diamonds? Look for the woman. Old Lang probably has a lady friend somewhere."

"I wish you'd come down to earth and act sane," stormed Scott. "I tell you Lang has been missing since Monday—three days."

"Lovely. Now I can rest," Keen said. "Of all the pests, that guy Lang was the worst. You'll be able to get something done now, Scott, old boy."

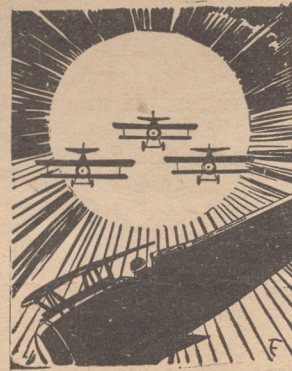
"I want you to help me, Keen. If anything happens to that guy, I'll go nuts. You may not appreciate him, but he's the best man on his job in the country. He's a bloodhound, a sticker, a guy who hangs on, and I couldn't replace him. I want you to help me."

"The Griffon told you to keep him off the Old Lyme business or he'd 'get his brains blown out,'" reflected Keen. "You know, Scott, that would be a pretty neat job of marksmanship—considering the size of his br—"

"He's not so dumb," Scott cut in. "And now how about it?"

"What can I do? I'm not even sure where Old Lyme is."

"It's at the mouth of the Connecticut River near—well, it's right here," explained Scott, pointing it out on the map.



"Um," mused Keen. "That's queer. You know that's not far from where that meteor hit last night. Notice that in the paper, this morning? . . . Here, on page 3. It says that a meteor fell on Black Point. There's Black Point farther along the Sound."

"Meteor? What the deuce sort of a story is that?" slammed Scott. "We got a report of a plane falling into the Sound just off Black Point. I wonder if there is any connection."

"Too many strange things happening along there, Scott," Keen said, studying the map. "But what can I do?"

"I don't care what you do. I want you to work on this Lang matter and see if you can pick him up. I've got that damned Milford flying-boat mess to take care of. You heard about that, I suppose?"

"Sure, but I didn't get much sense out of it. How the devil can someone steal anything as big as that—and get away with it?"

"If I knew, I'd be going after Lang myself. As it is, the poor devil has to rely on you. Come on now, will you give me a hand?"

"I'll take a run up there and have a look around. Give me the full dope."

AN hour later, Keen left Scott's office, walked along the corridor, then suddenly darted into a steel doorway which led to the emergency stairway. He fumbled behind a heavy iron pipe and drew out a small but smart leather case. Then slipping off his hat and coat, he clambered up on a stairway window sill and adjusted the small steel prongs of a lineman's telephone set to some wires that curled out of a light green box set high on the wall.

Had anyone come through at that minute, he would

have accepted Keen for what he appeared to be—a telephone repair man.

He balanced himself there for several seconds, then got a response on the line he was ringing. In a low disguised voice he said:

A monsoon should be found in the Indian Ocean—if you know your geography, Scott.

Then he quickly unclamped the steel clips, wound the wires around the hand set, and dropped down on the floor. The apparatus was quickly returned to its leather case. Then Keen slipped on his hat and coat, walked down three more flights of stairs, cut back into the corridors, and just caught an elevator car that was going down.

Outside in the street he hailed a taxi and ordered the driver to head for Grand Central Station.

BY three o'clock that afternoon he was back at Graylands, immediately darting back downstairs to where Barney was working on a long galvanized affair that looked like a bulbous torpedo.

Around him on the floor stood metal cannisters of carbide and phosphorus. There were strange spring gadgets and coils of wire everywhere and there was every indication that the Mick had been working hard. Two empty O'Doul's Dew bottles were on the bench and Keen knew his man had been enjoying himself in spite of the amount of work he had completed.

Keen jumped into a pair of brown overalls, checked everything quickly, then picked up the strange steel box they had snatched from the Fokker fighter they had downed the night before. He went over it carefully while Barney babbled on with the day's news.

"What the devil have you been doing to old Scott?" Barney asked as Keen pondered on the steel box. "He called up here four times since lunch, barking something about monsoons in the Indian Ocean."

"Well," replied Keen without looking up. "That's where monsoons are to be found, aren't they?"

"I don't know. What is a monsoon?"

"Well, it's a periodic wind which during one half of the year blows from the southwest across the Indian Ocean and during the other half blows from the northeast."

"Funny. Old Scott seems to think it's something to do with that Milford Monsoon flying boat which has been swiped."

"Maybe he's right," said Keen with a noncommittal air as he set the steel box in a forward compartment of Barney's torpedo. "Did you know there's a second Monsoon over at the Milford plant awaiting a test flight?"

"Another?" gagged Barney. "When do they pinch that one?"

"That's what's worrying me. I was over there—in that general direction—today looking for Lang, and I found out that they are to test it tomorrow afternoon. I had a good mind to ask the guy what time he was swiping it."

"You . . . you mean you know who has his eye on it?"

"A good idea."

Barney decided to lay off that subject. He knew Keen's mood, so he turned to and helped fix the strange steel box into position. For more than an hour they toiled. They filled the rear compartments of the device with carbide and phosphorus, then bolted the chamber panels back into position.

"We'll put it on the bomb rack now, Barney," said Keen, surveying their work. "Then we'll be all set."

"What about Lang?" Barney opened again as they struggled with the heavy torpedo.

"Still missing. May be in a bad spot."

"Poor old Lang. I'll bet he's fuming by now."

"So would you if you'd been tied up somewhere since Monday."

"Where do you think he is?"

"I have no idea," replied Keen.

"You lie like a trooper," snarled Barney.

"I have to at times. Let's buzz upstairs. I have a book I must read. And in the meantime, lay off that Dew. We've got a big night ahead."

FOR two hours Keen sat in his study poring over shipping annuals and the *Aircraft Year Book*. He jotted down names of firms. Then he opened his large atlas, went over a Mercator's map of the world, and worked out a series of charts and mileage plans. He also pored over a set of plane plans he had filed away in a large loose-leaf folder. Finally when finished he stared at two names that continued to bob up in his investigations.

He sniffed, shuffled all the papers together, and sauntered off to his bathroom for a shower. Later, as he dressed, the telephone rang and Keen took up the receiver and got John Scott who was in New York.

"Well?" Scott growled. "What did you get?"

"Nothing," replied Keen. "No trace of him even going up there. I checked with the police and he had not reported there or even been in."

"You go to the wharf?"

"Sure. Place looks as though no one had been in it for years. Just about falling down. Dangerous to walk about the floor even."

"Barney tell you I'd called?"

"Sure. Not much sense to it though."

"Well, this Griffon guy got through to me again soon after you had left and pulled a crazy line about monsoons being found in the Indian Ocean. What the heck does that mean?"

"He's right. That's where monsoon winds are found, aren't they?"

"But what the devil does that have to do with Lang and the smugglers?" pleaded Scott.

"You're the G-man in this act, not me. How should I know?"

"I don't think you're showing much interest in this thing, Keen. I'm telling you, I want that guy Lang back—right side up."

"Well, if you'd quit bothering me, maybe I could find some time to look for him. Now buzz off. I'm hungry and dinner is getting cold."

"Yeh? Well, maybe Lang is cold by now, too," moaned Scott.

"No such luck," replied Keen. "That guy'll be around to haunt me for years yet. Now let me alone. I have an idea, Scott."

"What is it?" cried the Secret Service man.

"A monsoon might be found in the Indian Ocean—if you wait long enough," smirked Keen, hanging up the receiver and leaving Scott to splutter at the other end.

"I DON'T like lugging a thing like that around in the air," Barney suddenly barked as they prepared the Black Bullet for her night adventure. "A bullet in the right spot and we'd go up like a soda fountain."

"I'll take vanilla," gagged Keen, stepping into his black coverall and adjusting a scarlet mask over his face.

"It ain't funny," argued Barney sniffing at the galvanized iron torpedo that hung in the torpedo crutch

(Continued on page 74)



If Reds and Nazis Clash

GRIPPING STORY BEHIND OUR COVER PAINTING

★ ★ ★

WAR in Europe! War that spreads across a continent, that draws everything into its grim maw, that seethes with nationalistic bitterness, and with the venom of political greed!

Outside of war-torn Spain there is at the present time an ominous lull in European strife—and it can only be eyed with suspicion. To those with the microphones of diplomacy and the craft of international intrigue, this lull is only the zephyr that ushers in the tornado of terror.

Wherever one looks in Europe, Fascism, Communism, and Capitalism are at odds. England, France, and Russia have been especially worried about Germany. Once it was Germany's "pocket battleships" that menaced the North Sea and the Baltic. Later on came the ominous reports of her secret air service. And now comes the undeniable news of her massive armies.

Hitler and his supporters want to see Germany holding a top-notch position in European politics. The grim defeat of 1918 is either completely forgotten or is used only as a steel-tipped prod to urge the youth of the land to greater sacrifices—a youth that could not know the bitterness of Verdun, Chateau Thierry, or the Somme; a youth vaccinated with a new courage to avenge the Treaty of Versailles and stage a new push to place Germany back on the pedestal as a world power.

Supposing, for argument's sake, that the Nazis would like to "start something." Well, Hitler and his staff know today that his "pocket battleship" navy cannot begin to think of engaging the British who bottled up von Tirpitz's fleet more than twenty years ago; the Maginot Line across north-eastern France is too much for his newly-formed armies; and his slim but highly publicised air service is not yet ready to slash its way across Belgium to the Channel. But it can be considered quite ready to wipe out the hated Polish Corridor which separates the proud people of Prussia from Pomerania and militaristic Berlin.

The Polish Corridor, which includes the Free City of Danzig on the Gulf of Danzig and which is the key to the Baltic, is the one stumbling block in the Nazis path toward Soviet Russia. If this wedge be obliterated, Germany can establish a free artery of transportation from Berlin to Konigsburg and place her armies in a position to threaten Soviet Russia from the west. In addition, the capture of the port of Danzig would give the German navy a perfect base to harrass the Russian capital of Leningrad.

The Polish Corridor was awarded to Poland for her part in the Great War, but those who know Poland realize that she would not put up any particularly stiff opposition to a German invasion of the Corridor—if that invasion were staged simply to strike a blow at Russia.

Poland has not forgotten the grim battles Polish students of Lwow staged against the charges of Russian cavalry in those bitter years of 1919, 1920 and 1921, to maintain Polish freedom. Americans in the Kosciusko Squadron, remembering the battles their ancestors had fought more than 150 years before, hurled themselves into the fray around Czudnow, Kiev, and

Biala Cerkow and staged amazing aerial battles above the Dnieper River to maintain that freedom and drive back the Cossack hordes. The world may have forgotten, but Poland has not; and any move anyone may make to strike a delayed blow at their hardy Soviet neighbors would not be seriously hampered beyond the usual diplomatic objections.

MEANWHILE, let us picture the scene which may be staged any day at Danzig. Let us suppose, for instance, that Germany feels she is ready for a thrust at her arch, anti-Fascist rival. Let us accept the fact that some day not so far hence, Nazi Germany will challenge the Communistic ideals of Soviet Russia. Germany, besides being Russia's political enemy, wants to make a move to gain control of certain forest, mining and petroleum areas. Practically all that Germany desires can be found within a 400-mile circle around Konigsburg.

A likely incident during Germany's first move has been colorfully pictured on our cover by our artist, Mr. Schomburg. The painting shows a new military type Dornier flying boat similar to those being catapulted off the German Luft Hansa depot ships. This plane might be powered with the new Junkers Jumo 204 750-h.p. Diesel engines such as are now being used on some of the Luft Hansa Junkers landplanes which fly between Berlin and Croydon. These motors are most adaptable for all mountings and are particularly suitable for various forms of wing mountings. In addition, they are compression-ignition engines which require no form of electrical ignition and are thus reasonably free from fire hazard.



A NUMBER of these military flying boats might be catapulted from the German depot ships of the *Westfalen* class, the like of which have been seen in the South Atlantic air line trade and more recently in this country when Dornier flying boats put on a routine run from the Azores to the east coast of the United States. These flying boats are known to be in existence, for our artist worked from actual photographs.

The free port of Danzig could be taken by land from Neustadt or Neufabrer on the German-Corridor border. A nut-cracker movement might be employed, using troops and materials from the East Prussian side. But the main thrust could be made by Dornier flying boats suddenly hurled off depot ships to bomb the port defenses, cut off communications with inner fortresses, and break down contact with interior troop concentrations.

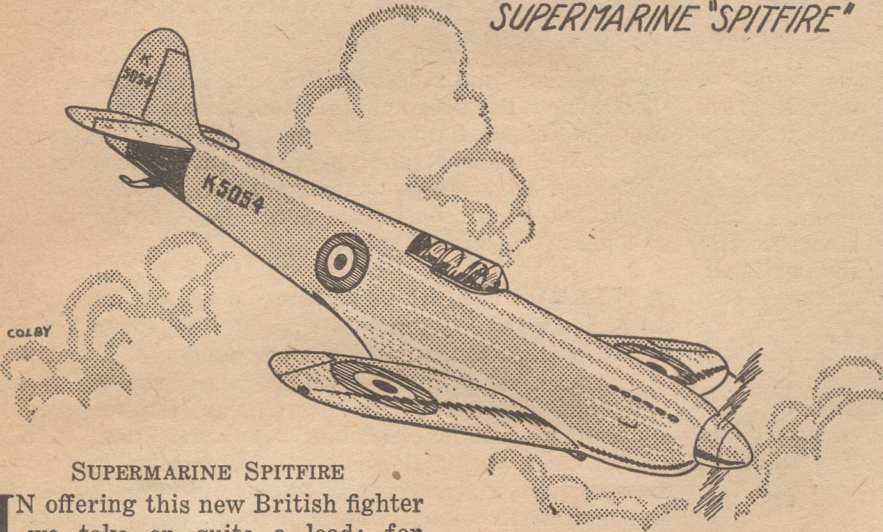
Fortunately for Germany, Danzig's population is out and out German (95.6 percent, according to the 1929 census). Of course, the city is presumably under the defense of the League of Nations, but after the futile working of that august body in the Ethiopian affair, it is easy to realize that this doesn't mean much.

In view of this state of affairs, Russia has always kept an eye on the Corridor. Should any German military plane appear in this area, it is reasonable to presume

(Continued on page 92)

Modern Planes Album

SUPERMARINE "SPITFIRE"



SUPERMARINE SPITFIRE

IN offering this new British fighter we take on quite a load; for nothing official is known about it beyond statements made by enthusiastic British writers. They tell us that it is the fastest fighter in the world, guardedly stating that it does "well over 300 miles an hour." How much over, however, has not been disclosed.

Actually, the machine is a low-wing monoplane fitted with the new Rolls Royce Merlin engine, which is also on the secret list as far as horse-

power is concerned. This power plant has been on display at various British shows, but its details are very much "hush-hush." It is a liquid cooled job and must hit in the neighborhood of 1,000 h.p. We must, of course, presume that it is an improvement on the tried and true Kestrel. It seems to have been designed for streamline fitting; for most certainly it closes-in well on the "Spitfire" (see drawing) and also

on the new Hawker "Hurricane." (The latter is the latest Hawker monoplane. "Hurricane" is its correct name, though several writers have incorrectly termed it the Hawker "Merlin.")

American readers will be surprised that the British get such good results with ordinary wooden props, but so far they are not completely sold on variable-pitch propellers, although they have bought manufacturing rights for our Hamilton-Standard controllable-pitch airscrew. Their attitude is that in small planes the greater efficiency of the variable pitch prop does not compensate for the extra weight and loss of speed. But they do admit that the "Spitfire" would do even better fitted with the variable-pitch propeller.

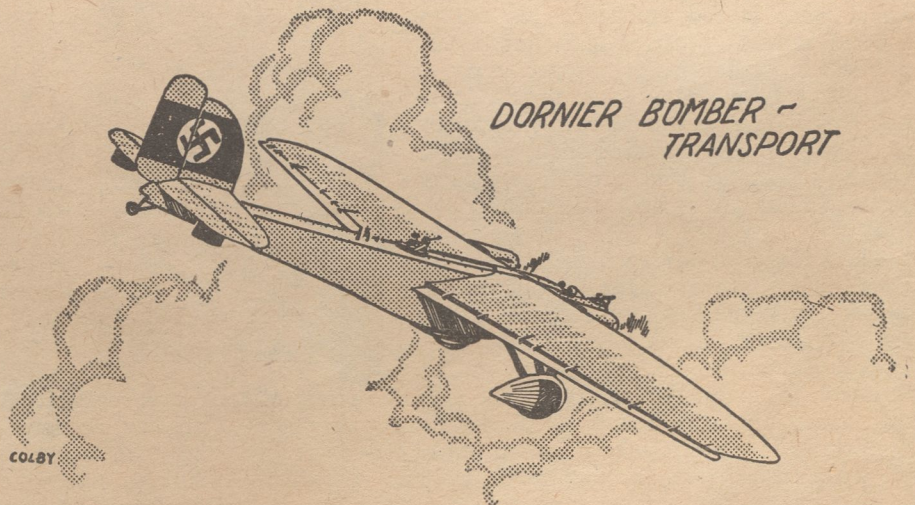
The "Spitfire," then, is a monoplane fighter, presumably designed for interceptor work and day fighting. This kind of work does not come up in American practice, and so nothing comparable to this machine has been built in this country. We must admit, however, that when the British finally went "monoplane" they certainly did go—with a bang. This seems to be one of the outstanding machines of its type in the world.

GERMANY'S DORNIER BOMBER

HERE'S something unusual in bombers—and it's another indication of the German trend, considering the fact that the Nazis do not appear to have gone very hard for single-seat fighters. At least the pursuit jobs they have shown have not been anything to get excited about.

This is the new Dornier bomber-transport, sometimes listed as the Do. 23. The accompanying drawing shows some of its interesting details. It is a semi-cantilever high-wing job with wings curved back along the leading edge and with auxiliary hinged surfaces just below the trailing edge to act both as ailerons and (with adjustment) as landing flaps.

The fuselage, which is monocoque and all-metal in construction, has three gun turrets and a pilot's cockpit. There is a gunner set in the nose with a flexible gun mounting, and behind him and just forward of the leading edge is the control cabin. Another gunner, who also handles the radio, is in the rear about in line with the trailing edge of the wing, and below his feet is a prone-gunner's position with a tunnel set



*DORNIER BOMBER -
TRANSPORT*

to allow firing under the tail. Very little beyond this is available as to the cabin accommodation.

This craft is powered with two 750 h.p. B.M.W. Vlu engines, which give it a top speed of 161 miles per hour. It cruises at 136 and lands at 54. It has a span of 84 feet, a length of 61 feet 7 inches, and a height of 17 feet 8 inches. The chord of the wing is 16 feet at its widest point.

The undercarriage is divided and

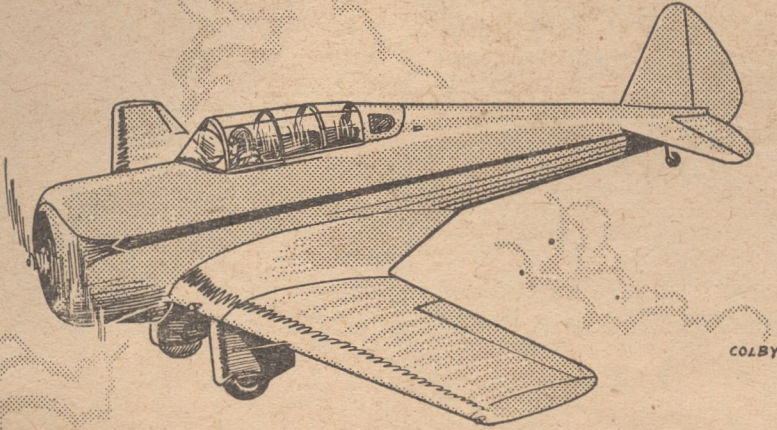
each unit consists of a shock-absorber strut, the upper end attached to the engine mounting and the lower hinged to the lower edge of the fuselage by a steel tube axle and radius rod. The wheels, which carry brakes, are enclosed in streamline fairings. An interesting feature of the ship is its four-bladed wooden airscrews.

The ship's disposable load amounts to 7,810 pounds, and her loaded weight is 20,240 lbs.

FOUR OF THE LATEST MILITARY JOBS

They're still busy turning out new ones—and here are a few that are outstanding: Britain's Supermarine "Spitfire," said to be the speediest yet; Germany's Dornier Bomber-Transport; and our own Curtiss-Wright 19-R and Vought V-143, two powerful cloud dashers newly groomed for the U. S. Air Service.

CURTISS-WRIGHT 19-R



CURTISS-WRIGHT 19-R

INTEENDED as a new basic trainer, this machine is manufactured by the Curtiss-Wright firm, presumably in competition with the Seversky ships. While primarily, it is a training plane with a Whirlwind engine, it is so stressed as to take higher horsepower motors and can be quickly converted into either a two-seat fighter or into an attack plane by adding two fixed machine guns in the wheel coverings.

Now they're getting the idea, if you get what we mean!

This machine is a low-wing monoplane using a cantilever stressed-skin wing. The fuselage is semi-monocoque and covered with Alclad metal. The cockpits are covered with sliding-cowl tops and the rear seat may be suitably arranged for an observer's cockpit fitted with a movable gun mounting.

The wing structure is multi-cellular and is built up on five shear

beams with ribs spaced along the span at twenty-inch intervals. The ailerons are dynamically and statically balanced. The wing is attached to the fuselage through a riveted channel on the fillet. The attachment of the wing panels is completed by a splice just outboard of the landing gear. The general dimensions are: wing-span 35 feet, overall length 25 feet, and height 7 feet 6 inches.

Armament includes one fixed machine gun fitted to fire through the prop. The ammunition case carries 500 rounds. The rear gun mounting retracts into the fuselage when not in use and the bombing racks carry two standard A-3 bombs.

The speed figures naturally change with the equipment used or the motor fitted. With the Wright Whirlwind R975-E2 and with full military load, it has a top speed of 203 m.p.h. As a straight trainer without armament she does 215. With the lighter power Whirlwind—the R760-E2—she has a top speed of 182 with full armament. No change of engine mounting is necessary for either motor, but a slight modification in the cowl is necessary in some models. Her tanks carry 70 gallons of fuel.

VOUGHT V-143 FIGHTER

THIS is a new low-wing monoplane fighter built by the Chance Vought Corporation of Hartford and developed from original designs from the Northrop factory. The thing that strikes us is that this may be a reproduction of the missing Northrop fighter which disappeared so dramatically on the west coast a few months ago. Most certainly it has many of the lines of that ship which went off on a secret test flight and was seen no more.

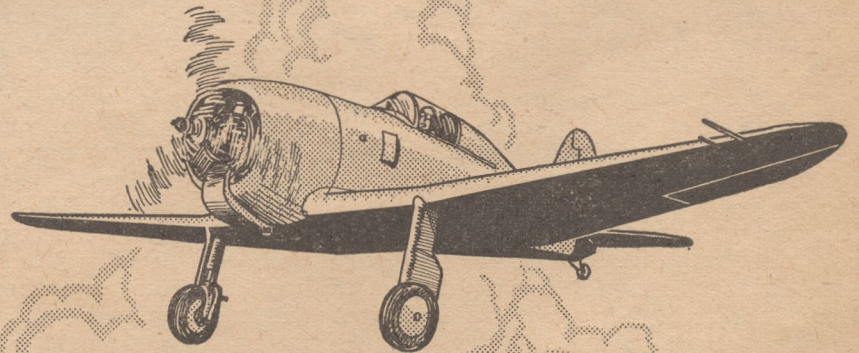
Anyway, this machine has been test flown at the factory and at this writing was being transferred to Rentschler Field for the Materials Division to work on. The original tests were made with the 750 Wasp, but the craft will also take the new Junior Wasp, which is a nine-cylinder job rated at 600 h.p.

This V-143 is an all-metal job throughout, with the exception of the control surfaces, which are covered with fabric. There seems to be no explanation for this, but apparently the load factors are sufficient to permit aerobatic maneuvers and terminal velocity dives whether it's

fitted as a pursuit ship or a fighter.

The speed figures given out by the Vought firm are as follows: Maximum speed at 8,000 feet, 250 m.p.h.; cruising speed at 8,000 feet with 75 per cent of power, 220 m.p.h.; cruising speed using 50 per cent of power, 220; landing speed, 60; rate of climb, 2,100 feet per minute; service ceiling, 28,000 feet; and cruising range, 770 miles.

VOUGHT V-143

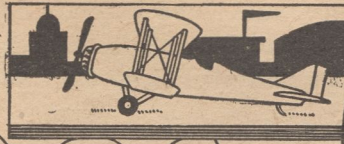


Her performance is aided by a retractable landing gear and wing flaps. Cowl flaps are used to control engine cooling, and regulation equipment includes a Hamilton-Standard controllable-pitch prop.

Armament consists of two .30 caliber guns mounted in the fuselage and firing through the airscrew with 500 rounds of ammo for each. External racks carry 300 lbs. of bombs.

HAPPY LANDINGS

BY ARCH WHITEHOUSE



Bomber-Fighters Threaten the Single-Seaters

What is to be the fate of the single-seater pilot? The editor invites you fans to sit in here and listen while a couple of war-time air vets argue it out. And he also invites any present-day sky fighters who read this to hammer right back with their slant on the question.

★ ★ ★

WE have read the accounts of the recent Nazi war games and have attempted to digest the findings of the foreign military experts who were fortunate enough to witness the extraordinary events that took place. The "war" was not conducted in the World War manner at all. There were no trenches, no dug-outs, no communication lines—and few single-seater planes.

The new German military strategists showed a puzzled gallery how they believe the next war will be staged. The battlefield was deserted of all forms of static military movement or groups. Instead, observers saw a series of quick thrust movements, carried out by specially trained troops moving at high speed and advancing in forays protected by whatever topographical cover was available.

This form of warfare, of course, demands a complete change in the accepted forms of supply systems. No longer will the service corps be able to rush supplies to temporary dumps for the infantryman to crawl back to. It appears that the armored car divisions will have to accept much of the supply column work in order to assure servicing of the advance lines.

We must presume that aircraft will also have to take part in this supply business, dropping food, ammunition and supplies to the many small groups that make up the attacking force.

All this brings us back to that old argument concerning the single seater. Every month we get a stack of letters asking us to give our opinion on the matter. Most of them virtually plead with us to come out and say that there will always be single-seat fighters and that the next war in the air will be won by the pursuit pilot.

Unfortunately, we can't make any such statement. In the first place we don't claim that *any* war can be won in the air—and we say this still believing that we are as loyal to the old air services as any man who ever saw an airplane.

Most certainly the World War was not won in the air. It was the infantryman who won that scrap, assisted materially by the air services and the artillery. Nothing, as far as we can see, has yet replaced the common soldier—the old gravel-crusher and his bayonet. Perhaps

the tank corps men will ultimately replace him, but after all they are only glorified infantrymen moving in mobile fortifications.

But to get back to this old argument concerning the single-seater, we have been in touch with many ex-scout pilots who are still actively interested in military aviation, and so far we have not found one who has any desire to get into a single seater in a war of today and attempt to tackle a modern bomber-fighter.

"What chance would you have?" one asked me the other day. "Those flying forts appear to have as good speed as the single-seat fighters, and on top of that they are gorged with guns. As far as I can make out, they have no blind spots of any sort."

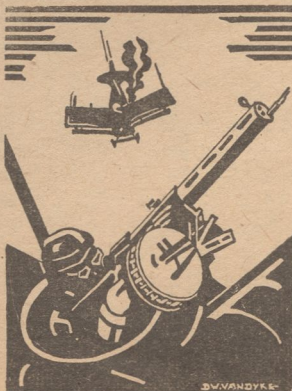
I was trying to get deeper into it and said: "But don't you think the modern single-seater is more maneuverable?"

"You know they're not," he replied. "Nothing traveling at 250 m.p.h. can be considered maneuverable. Did you ever hear of any of these foreign stunt stars using a high speed ship? In a single-seater, you get one shot at the enemy bomber; then if you miss, or only get one pilot or one gunner, your plane overshoots. Anyhow, by the time you can turn back, you're in the next state."

"Moreover," he went on, "I have seen most of the leading single-seat machines both here and abroad, and frankly I do not believe any of them is much better from a fighting standpoint than my old Sopwith Camel. The new jobs have more speed, yes—but that doesn't count any more because today the single-seater pilots have too much to worry about. There's the business of raising and lowering the landing gear. Then there's

more work with oil-cooling radiators and retractable water radiators. They have two-way radio sets that work, and most of the time, they fly tight formations listening to orders from some guy up front, or they have to watch for visual signals, most of which would keep the most intelligent signalman busy for weeks. They have too much to do to compete with the bomber fighter birds."

"BUT they're smart and well trained. Better trained than we were during the World War," I argued, mainly to get more of this sort of thing.



"Now you've hit it," he said grinning. "Now you've hit it. Do you know, they can't really train a modern single-seater pilot today in less than eighteen months. Where are they going to get replacements after the first month of warfare?"

"Well," I said, "when I joined up with the British early in the War they told me they couldn't make a machine gunner in less than three years in peace time—but they sent me out with only two weeks of training!"

"And how good were you?"

"Well, I lived through the Big Show," I parried.

"All right. You came back. But think now and figure out how many in the same group that took that two-weeks gun course actually came back."

"Sorry," I said. "I'd rather not go into that."

"So. And now how long do you think it would take to make a good machine gunner?"

"At least twelve months."

"And how long do you think it would take to teach a man to fly a Boeing P-26, a Hawker Hurricane, or a French

Morane fighter?" he asked quickly.

"Properly? Well, at least a year to give him everything from guns to radio. Yes, at least twelve months."

"Okay. There's your answer to the single-seat fighter proposition. The single-seat sky fighters who are fully trained today might stand a fighting chance against the modern high-speed bomber, but the men who would be trained in war-times most certainly wouldn't."

"Will it be any easier to train bomber pilots?" I asked.

"Certainly. All the second-pilots, bomber officers, and even the N.C.O. gunners are potential bomber pilots. They have been in the air and have gained their 'air sense.' They could be trained in about one-fifth the time it would take to train a civilian."

"Still, would it be any easier?" I went on trying to get to the bottom of his mind.

"Well," he came back, "a pilot aboard a bomber-fighter would not have to go through as many types to get to his bomber-fighter as the single-seat fighter pilot does to reach his high speed ship.

He will be expected to learn only how to fly and how to do long-distance shows. He will not be worried about learning radio, guns and gears, bombs and detonators. He will be a pilot, pure and simple."

"But today bomber-fighter pilots take all those courses," I argued.

"Of course. They do a lot of silly things in peace time that would be dropped in war times. And look at all the transport pilots that could be picked up with no trouble at all. But put one of those transport pilots in a Boeing and see what happens. Do you get me?"

"I'm beginning to," I answered. "I'm only trying to get you to justify many of my own impressions. I, too, think the single-seat, except in rare instances, is on the way out."

"Name one instance," he demanded.

"As a straight interceptor," I said. "They're beginning to build dirigibles again."

"You're right there," he agreed. "And say, would you like to fly an interceptor if you got the chance?"

(Continued on page 91)

The Airmail Pals

* * *

AGAIN this month your old friend, the R.H.P.D., is knee deep in pen pal letters! As we gaze out of our window here, old Broadway is electrically ablaze and there are lots of fine shows and pictures going on down there. But we've decided to be true to you pen pushers and stick to this job 'til finished.

We're particularly happy this trip because a number of you have written us a few lines. Really, we have gotten awfully blue in times past reading all those fine letters written to others. But that's all past history now. It's great, too, the way you scribbler-esses co-operated when a short while ago we mentioned a shortage of girl pen pals. *Femmes* from North, South, East and West came to our rescue. Even so, we still need more. So come on girls!

Glenn Myers, Monroeville, Ind., has written us a note representative of many received daily by the Right Honorable Pal Distributor. Says Glenn:

"Through your courteous help I received the finest pal I ever wrote to. I have received interesting letters, magazines, and other useful information."

Well, Glenn, we're mighty glad things worked out so swell for you. And any of you other F.A. readers who haven't yet taken a "shot" at our Airmail Pal offer will find full dope on how to do it in the accompanying box. There are many fine pals waiting for you, too.

And say, scribes, we're again going to ask you to take pity on us. You'll recall that sometime ago we said it was impossible for us to fill requests calling, for instance, for a "pal exactly 6 ft. 4½" tall, living in Altoona, Penna., who saves the tops of corn flake boxes and bats left handed," or for "a fellow with a short mustache, a Model T Ford, and a B-flat Bazooka who lives in Squeamish, Idaho."

But still such tough requests pile onto our desk. Here's one asking for "a girl whose birthday is July 4th," and yet another from a fellow who wants to correspond with "a member of English aristocracy." Now

we ask you—what's a poor R.H.P.D. to do? We aim to please, pen pushers, but Judas Priest and little em-pennages, "please" refrain from giving us riddles like that to figure out.

Just as we're about finishing this job, who should walk into the office but Joe Archibald. Joe offers to loan us Phineas to help sort the next batch of pen pal letters, but we think we're wise in declining—for if Carbuncle got going here, you fellows and girls could be darn sure of getting the kind of pals you *didn't* want.

Well, ink slingers, we've finished the job and we're off for home. *Au revoir* for this time. We'll be seen' ya right here on the pen pal tarmac a month hence.

—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.

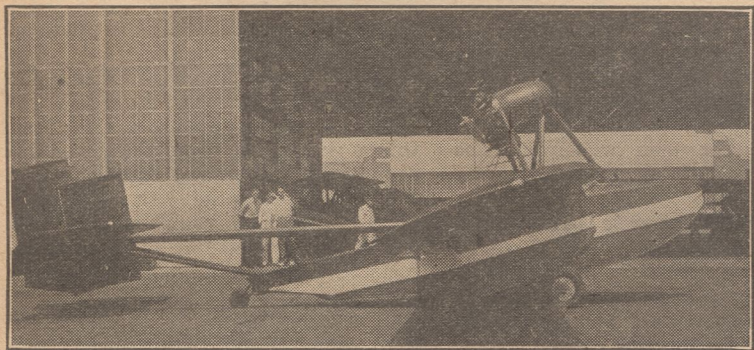
REGARDING FOREIGN PEN PALS

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.

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.

Take a peek at this new Privateer offered by Amphibians, Inc., of Garden City, L. I., N. Y. You'll note that the hull has been re-designed and that the tail assembly is now supported by tubular dural booms. For duck hunting or fishing, you can't beat this land-and-water job. We understand she'll take either a Continental, a Jacobs, or a Whirlwind.



What's Happened to Gliding?

We See Soaring
Cabin or Cockpit?

A Few Shorts

On the Light Plane Tarmac

WHAT'S HAPPENED TO GLIDING?

WE only realized how far down the scale of interest the sailplane business had gone when we recently attempted to collect some information for a few fans who were considering building a glider during the winter. They wrote in asking where gliders and glider supplies could be bought—and when we went to look it up, we came up against a blank wall.

We searched all the best air magazines. But there was not one mention of anything connected with gliding.

Several of the magazines that have sought features on gliding have completely run out of the German material. Moreover, the Cape Cod school has closed up.

America's one bright spot has been the national glider meet held every year at Elmira, N. Y. With good weather conditions, they seem to do something there—enough to get a one-column headline in the morning papers. A lot of glider records are held here by Richard C. DuPont, and we hear that Hawley Bowlus is considering the manufacture of an all-metal glider. But outside of this, what has happened to the glider business?

A few years ago we had visions of glider clubs all over the country, but nothing came of it. Good crowds will turn out to look on, but very few seem interested enough to take a crack at the game.

Of course, gliding itself has much to answer for. We saw the mad era where everything and everyone was being yanked off the ground with anything from a shock cord to a 250 m.p.h. airplane. They looped, spun, and crashed all over the place, and in no time drove the sane ones away.

We were personally interested in a club a few years back when a number of young business men chipped in a few hundred dollars to build or buy a glider. We obtained a suitable field and an old build-

ing and were content to move slowly and have a lot of fun.

Then someone came along and started the old high-pressure game. Salesmen deluged us with mad plans for special hangars, launching devices, and modernistic soarers. Then before we knew where we were we had sped past gliding and they were actually flying powered planes and selling joy rides on our gliding field. They raised more money, bought crates of every description, and provided a system of sales and service. We poor glider merchants stood around and watched for a few days, then went sadly home.

You know the rest. The club went bad and in no time our glider field was a shambles of crashes and financial ruin. Everything in the world but gliders.

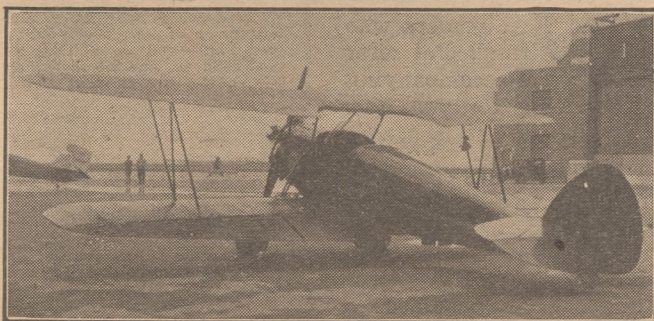
That seems to be the typical story wherever we go. A lot of people want to get into the gliding game, but few seem able to keep their heads and stick to it.

If any of you fans have any good, workable ideas on this subject, let's hear 'em. We'll guarantee to hand the ideas along to the fellows who are more than keen to give the glider game a whirl. Gliding is the first sane move toward the light plane game and the flying club idea, and the sooner this point is considered, the better for all concerned. It's a beautiful sport, and it's comparatively inexpensive. It creates a form of friendly cooperation that nothing else quite equals. Where

you find a group of men working together to get a "bird" into the air, it is natural that a sincere quality of comradeship must result. Take it from us, there's a big kick in sky-sailing without the roar of motors, the smell of gasoline, and the wail of propellers.

WE SEE SOARING

SINCE writing the above, a group of FLYING ACES editors and staff writers has visited the Ellenville, N. Y., gliding



Top: Soaring! That's one swell sport, as amply evidenced by this "shot" snapped by an F.A. staff man at Ellenville, N. Y. Note that the graceful motorless bird has gained considerable altitude over its mountain take-off point shown in the lower right of the picture. Below: Out at Lincoln, Nebraska, the Arrow Aircraft and Motor Corp. is now turning out this neat side-by-side open cockpit biplane. How do you like those tapered wings and N-struts? Quite a different job from the two-seater low-wing the Arrow people used to make.

and soaring site. And we received a very encouraging jolt!

We saw youngsters barely eighteen zipped off a hill 2,300 feet above the town in advanced soarers. We watched them stay in the air for periods up to three hours. We saw them lug their frail but beautiful craft up a hill that would make the average Army tank sit down and throw away its creepers. And we saw them land in fields five miles away—right on the minute of a pre-arranged schedule—and dismantle them for another trip back up the hill.

All this was done with little or no publicity, fuss, or excitement. They arrived there on Saturday, had their ships all ready on the take-off field the next morning, and were soon in the air hanging up glider time with as much personal enthusiasm as the greatest power-pilot ever put in for his transport ticket. Take a look at the accompanying photograph we took of one.

We're convinced that this is a great sport for the masses embodying the true club idea at its fullest. There were no accidents, no crazy attempts at the spectacular, but plenty of skillful work handling the thermals and "looking for air," as these youngsters put it.

If you have never seen real soaring, you have the greatest treat in store for you. Personally, we'd sooner have an Ellenville glider than Vanderbilt's America Cup yacht!

Someone has got to do something about this gliding and soaring business.

CABIN OR COCKPIT?

FOR those interested in light planes, a new problem has cropped up—as if there are not enough already.

This time, they're arguing whether a beginner should purchase a cabin plane or an open cockpit job. The cabin plane is more comfortable in all weather, but the open cockpit craft gives a dash of open air adventure—which Aunt Nellie (who may have been induced to pour a few shekels into the venture) may not appreciate.

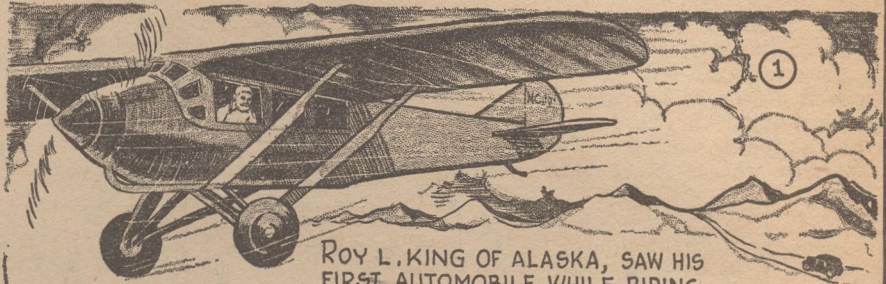
But now, after all these years, someone who perhaps lost a few dollars in an open cockpit venture, brings out the fact that under certain drizzle or light rain conditions, the cabin plane is none too safe to fly. By this he means, of course, that if the wind-screen has been a little dusty, a light rain will give the glass an opaque quality and in attempting to peer through there is a great possibility that the pilot may make a bad landing.

There are some who will at once bellow about wind-shield wipers. They'll point out that few Transport pilots ever use them, but instead are content to take a chunk of howling gale and a slight drenching during the last few minutes of flight to make certain that they get their wheels, and not their prop, down first. It indicates, of course, that what is really necessary is some form of hinged section with a curved bow in front which will loop the air stream over the small opening and thus give the cabin pilot a clear view through the rain under these trying conditions.

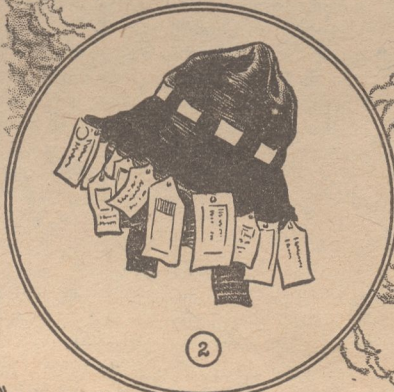
The idea is free. We simply won't

PILOTOPICS

By ROY HUMPHRIES



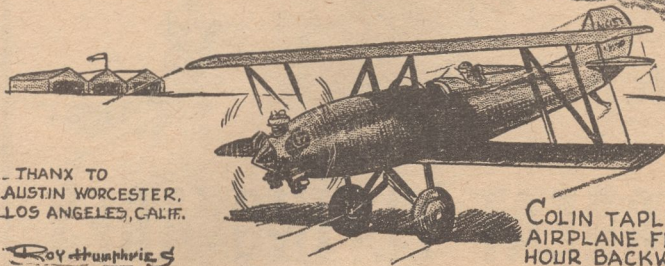
ROY L. KING OF ALASKA, SAW HIS FIRST AUTOMOBILE WHILE RIDING IN AN AIRPLANE...



"WICKEY," FAMOUS GLOBE-TROTTERING HAT BRINGS GOOD LUCK TO PLANES IN FLIGHTS ALL OVER THE WORLD...



JOE CRANE, MADE A PARACHUTE JUMP AT 2 A.M. AND LANDED AN HOUR EARLIER...



...THANK TO AUSTIN WORCESTER, LOS ANGELES, CALIF.

Roy Humphries

COLIN TAPLEY, LANDED AN AIRPLANE FLYING 15 MILES PER HOUR BACKWARD !!!

Stories Back of the Above Pictures

1—THERE are few automobiles, even today, in the arctic regions near Wiseman, Alaska. Thus, it was only recently that Roy L. King, an old prospector in that territory, got his first glimpse of a motor car. And he saw it from an airplane!

Time marches—backward!

2—A RETIRED St. Louis freight-handler, Albert E. Wickey, always wanted to travel, preferably by airplane. But never being able to afford it, Mr. Wickey finally did what he considered was the next best thing. He sent his hat traveling aloft over the airways, and to date the air-minded headpiece not only has been flown all over the United States but also to Central and South America, Europe, Africa, Alaska, and the Far East.

It was air travel by the brim full.

3—WHEN the clocks at Roosevelt Field, N. Y., were set back an hour this fall, denoting the end of that community's summer Daylight Saving Time, parachute jumper Joe Crane was on hand to make a unique "backward" sky plunge. He bailed out of a plane over the airport a few seconds before 2 a.m. when the hour hands were officially returned to Standard Time. And thus when he landed it was only 1 o'clock.

And at the International Date Line, you could bail out Monday and land Wednesday.

4—COLIN TAPLEY, British World War flyer, also pulled off a "backward" stunt a few years ago when he set down his plane in the teeth of a gale. His ship's landing speed was 40 m.p.h., but the wind was hitting 55—so Tapley came in 15 m.p.h. backwards! His tail skid stopped him.

Lucky he wasn't in a Flying Flea.

take a single red cent for it.

A FEW SHORTS

THERE'S hope for the light plane game in the news that of the 664 airplanes manufactured for civilian use during the first six months of 1936, 28.91 per cent were the products of the Taylor Aircraft Company, manufacturers of the Taylor Cub. We haven't the time to figure out just what 28.91 per cent of 664 is, but maybe you get the idea. What they're actually trying to say at the Aeronautical Chamber of Commerce where these figures were

compiled, is that a great number of so-called air-flivvers are being manufactured and sold.

D. E. Anderson who designed the Cadillac V-8 and later on assisted in the development of the Ford V-8 has joined the Arrow Aircraft Corporation as a consulting engineer. Now you can sit back, boys, and see what an automotive engineer can do for the light plane game. We hope he clicks and sweeps out all that bunk to the effect that nothing out of the automobile game can do aviation any good and that you can't

turn an auto engine into a plane power plant.

Go to it, Andy!

You birds who live down in the sunny south in the winter should not miss the ninth annual Miami All-American Air Manuevers which will be held at Miami on December 10, 11, and 12. The municipal airport has been put into swell shape for the show. A number of Latin-American customers are expected, and that's why it's an All-American affair. But they're going to keep that French guy and his Caudron out of the thing!

The Story of Dive Bombing

(Continued from page 19)

chosen for the task of constructing this craft—the XT5M-1. Thus, the first true U. S. Navy dive-bomber came from the Martin plant early in 1929, just as the first torpedo-plane came from the Martin factory early in 1919. As can be seen in the photo accompanying this article, the plane still bore the "three-purpose" destination in contradiction to its primary function of dive-bombing.

Later in the same year there followed the XT6M-1. This was little more than an XT5M-1 designed specifically for torpedo dropping; but unlike previous types, it was designed to accommodate a 1,000 pound torpedo and was correspondingly more compactly built than its predecessors.

A comparison of the Martin XT5M-1 dive-bomber and the Martin T4M-1 torpedo-plane (three-purpose) which it superseded, is interesting. The facts are as follows, the first figure given being that of the dive-bomber, the second that of the three-purpose plane: Motor—575 h.p. "Hornet"; same. Wing span—41' 0"; 53' 0". Length overall—28' 5½"; 35' 2". Height—11' 6¼"; 12' 7¼". Useful load—1,460 lbs.; 2,000 lbs. Speed with full load—140 m.p.h.; 122 m.p.h. Climb in 10 minutes—7,600 feet fully loaded; 5,000 feet fully loaded. Service ceiling—16,500 feet; 12,000 feet.

In the year 1931, the following airplanes were contracted for: Twelve Martin BM-1's (the XT5M-1 under its new classification); sixteen Martin

BM-2's (formerly XT6M-1); one Consolidated XBY-1; and thirty-two Detroit TE-1's. In the case of the BM-2, it will be noted that although it is a torpedo-plane this craft carried the dive-bomber designation.

IN the year 1932, the Martin company finally completed its production order for aircraft of the dive-bomber and torpedo types. The final total numbered sixteen BM-1's and sixteen BM-2's. In addition to these, delivery was also completed on thirty-two Great Lakes TG-2 three-purpose planes.

During the same year an effort to consolidate the attacking force of aircraft into a single unit consisting of the fighter escort and dive-bombers was made. In other words, the protective fighter convoy was to be considered an integral cog in the attack, allocated permanently to the dive-bomber or torpedo-plane force. Its duty was to open the attack with light bombs and machine-guns, harassing and demoralizing the target, in this way literally smoothing the path for the dive-bombers that followed.

You see, prior to 1933, fighter convoy planes merely cruised above the scene of bombing operations with the single duty of dispelling an attack from above. The craft particularly designed for this function was the Berliner-Joyce XF3J-1. It was a dihedral-winged, single-bay biplane powered by the Twin Wasp Jr. of 700 horsepower which had just made its appearance. The model was ultimately turned over to the Navy early in 1933. This type was further unique in that it was the first airplane to use the latest development of the N. A. C. A. cowl. This new cowl incorporated a series of adjustable flaps at its trailing edge governing the passage of air past the cylinders and also acting as a thermal control. The cockpit was fully enclosed by a glass wind-screen.

In direct contradiction to the 1931 belief that the Naval Air Service had washed its hands of the multi-purpose planes, two models, one a TB and another an SB type, were tested late in 1932. As the designation implies, the TB was designed for torpedo and bombing functions, the SB for scouting and

(Continued on page 91)

Watch for the



NEXT GREAT FLYING ACES

FICTION—"Buzz Benson" in another smashing, action-packed Pacific war novel.

"Phineas" back again in "P.D.Q.-Boat," a pip of a story and a tidal wave of laughs.

Plus a bang-up modern novelette.

FACT—A dramatic article about sky fighting in the movies. More about modern machine guns—another David Martin special.

And "What of the Rocket Plane?"—a sensational story about the sky ships of tomorrow.

MODEL BUILDING—Plans for a striking flying model of the sleek Davis D1-W.

Solid model plans for the Grumman F2F-1.

Full layouts for the Fokker F-36.

And a great feature on gas job contest rules by Phil Zecchitella.

**IN THE
FEBRUARY FLYING ACES**

**ON SALE
DECEMBER 25th**

JOIN THE FLYING ACES CLUB

Honorary Members

President and Mrs. Franklin D. Roosevelt	Rear-Admiral Byrd
Vice Pres. John Nance Garner	Capt. Edward Rickenbacker
Casey Jones	Colonel W. A. Bishop
Wallace Beery	Major G. A. Vaughn, Jr.
Al Williams	Willy Coppins
Col. Scaroni	General Balbo
Major von Schleich	Amelia Earhart Putnam
Lieut.-Col. Pinsard	Frankie Thomas
G. M. Bellanca	Josef Veltjens
Capt. Boris Sergievsky	Tom Campbell Black
Colonel Roscoe Turner	Eric Kingsford-Smith
Charles W. A. Scott	Capt. Edwin C. Musick
Richard C. DuPont	Clarence D. Chamberlin
Capt. A. W. Stevens	Mrs. Charles S. Baylies
Capt. O. A. Anderson	Lieut.-Col. Theodore Roosevelt
Major Fred Lord	

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. 50

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 postpaid anywhere in the U. S. and possessions for only 50c. (A STERLING SILVER ring, of similar design, may be had for \$1.00)

January 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 WINGS
of the Flying Aces Club

COUPON
No. 47



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

Happy Landings on the F.A.C. Tarmac, fellows! A pack of swell letters have poured into GHQ since last month, and we're all set to share 'em with you. Line up, everyone, and get set for a barrage of top-notch news.

CHEERIO, F.A.C.'s, this is your old friend, Doug Allen, once more "broadcasting" the club news—and what a batch we have this month! New and old friends alike have swarmed to the tarmac, so just taxi over and join.

The first letter we note is from our old friend, Rita Goodger, of Christchurch, N. Z. Since copies of our mag reach far off New Zealand a great deal later than you buzzards get 'em in this country, Rita has just been afforded the opportunity of looking over the victims in the ward of the Mt. Blooley hospital and she expresses her sincerest sympathy. Thanks a lot, Rita, and we're glad to say that everybody has fully recovered. Incidentally, we've got a new F.A.C. Transport now. Three-view plans for it will be found on the opposite page.

In reading further we note that Rita has some interesting information to convey, and believing it will be of interest to all members of the Club we quote her letter in part:

"... I must also tell you that at the annual Winter Exhibition, which is held in every town in New Zealand, there was a model aeroplane stall—or booth, as you people say—and the builders were showing the public how models are constructed. The most interesting part was the prominence of FLYING ACES magazines. They were on hand everywhere."

That surely is good news, and we're mighty glad indeed to know that old F.A. is becoming more and more popular abroad.

Most of you will remember that in our October num-



Meet Bill Bartlett, F.A.C. member in far-off Johannesburg, South Africa. That's a copy of good old F.A. he's got in his hand. On the back of the photo Bill wrote: "Don't think this is a prehistoric animal—it's supposed to be me." Tut, tut, Bill! You're too modest about your Clark Gablean features.

ber we announced appointment of W. D. Davis as G-2 commander of the Dallas, Texas, district. Now we're sorry to tell you that due to the fact that friend Davis has moved to Perryton, Texas, his resignation from the Dallas job has become necessary. "W.D." has done a fine job in Dallas, and through his work FLYING ACES has gone to high altitudes there. In leaving, however, Davis has appointed Cliff Thompson to take his place, and we certainly have every confidence in "Cliff."

From far off Johannesburg, South Africa, comes a fine letter from our old friend, H. G. Baker, who calls himself "The Hawk." Friend Baker enclosed with his letter a copy of a poster advertising FLYING ACES which he has managed to get on display in 18 stores in Johannesburg.

That's fine work, "H.G.," and we of GHQ are mighty proud of you!

And now here's something written for the special attention of G-2 members. Most of you will recall the note appearing at the bottom of page 83 in our December issue telling of the disappearance of "Doodie" Mofchum, 341 Dahill Rd., Brooklyn, N. Y. "Doodie," we understand, is an ardent reader of FLYING ACES and since he is a member of the F.A.C., we would like to be instrumental in locating him if it's humanly possible. This is a fine chance for you "G-2rs" to go to work on a real case, so let's everybody hop to it. The missing boy is 16 years old, is five feet eight inches tall and has dark brown hair. Please be sure to make all reports to Doug Allen.

From Rochester, N. Y., comes a letter from our old radio friend, Hank Carter, operating W8JOT. Hank assures us that when talking with "hams" on the air he at all times advocates that they join the F.A.C. That's the stuff Hank and here's hoping that all other members of the F.A.C. R.C.C. boost the Club likewise—if they are not already doing so.

The above reminds us that many of you radio "hams" must be wondering whatever became of the radio contest conducted a few months ago. Well, as a majority of our members know your old friend Doug was taken seriously sick shortly after the contest got under way and was unable to contact Captain Berig, at Boston, who was really conducting the game. As this issue goes to press we are ironing out same and trust to be able to announce the winners in our next issue. So be patient, buzzards, be patient.

APPARENTLY, Bruce Deutsch, R.R. No. 3, Box No. 51-A, South Bend, Ind., has been pretty hot under the collar. In a recent letter he says, in part:

"... boy, O boy, am I mad! If I don't

<p>THE "STAR" REFRESHMENT ROOMS</p> <p>OPP. NEPEAN THEATRE</p> <p>Choice Fruit and Lollies</p> <p>Try Our Milk Bar</p> <p>MRS. TIPPING</p> <p>HIGH STREET, PENRITH</p>	<p>Buy the "Flying Aces Club Magazine"</p> <p>OFFICIAL ORGAN OF FLYING ACES CLUB</p> <p>ORDER NOW AT FITCH'S</p>	<p>S. J. HAINES</p> <p>HAIRDRESSER & TOBACCONIST</p> <p>For a Good Shave and Haircut</p>
<p>Join Our EXCHANGE LIBRARY NOW</p> <p>Good Selection of Books</p> <p>A. B. JENKINS</p> <p>NEWSAGENT</p> <p>HIGH STREET, PENRITH</p>	<p>Flying Aces Club, No. 2 Squadron</p> <p>Sports Meeting</p> <p>AT CRANE BROOK</p> <p>— ON —</p> <p>SATURDAY, 13th JUNE, 1936</p> <p>AT 2 P.M.</p> <p>SPORTS ASSISTED BY CRANE BROOK F. AND C. ASSOCIATION</p>	<p>OPP. MEMORY PARK</p> <p>HIGH STREET, PENRITH</p>
<p>A. FREW, TAILOR</p> <p>Smart Tailoring for Smart Men</p> <p>All Materials of Highest Quality</p> <p>HIGH STREET, PENRITH</p>	<p>Main Events</p> <p>Woodchopping</p> <p>Cycle Races, Junior and Senior</p> <p>Foot Races Novelty Races</p> <p>Yo-Yo Competition Other Events</p>	<p>MOHAN AND CATO, LTD.</p> <p>HIGH STREET, PENRITH</p>
<p>THE PARK GARAGE</p> <p>(Opp. Memory Park)</p> <p>J. N. PEEK</p> <p>Hudson Terraplane, Willys "T"</p> <p>First-Class Repairs at Popular Prices</p> <p>Handy to Know, Phone 130</p>	<p>Inter-Squadron Events</p> <p>Cycle Races Foot Races</p> <p>Prizes for all Events</p>	<p>All Goods of Highest Quality</p> <p>Phone 216</p> <p>Fayrefield HATS</p> <p>They called</p> <p>Your Next Hat</p> <p>NEALE BROS. PENRITH</p>
<p>We Never Crumble at whatever hour you require our assistance, we are ready and willing to assist you. This Pharmacy will serve you at all hours. You only need to try us once to prove this!</p> <p>E. E. BURKE, M.P.S., F.L.C.</p> <p>CHEMIST & DRUGGIST, PENRITH</p> <p>Phone Penrith 24</p>	<p>Admission: Adults 6d, Children 3d</p> <p>"Hesper Times" Print, Penrith</p>	<p>BAKTER'S SUNSHINE CAFE</p> <p>Dinners Served 12 to 2 p.m.</p> <p>Orills and Refreshments Any Hour</p> <p>Fruit, Confectionery, Milk Drinks</p> <p>NEXT JUDGES' PHARMACY</p> <p>HIGH STREET, PENRITH</p>
		<p>WHITE WAY BUTCHERY</p> <p>HIGH STREET, PENRITH</p> <p>Only the Best Quality Beef & Mutton</p> <p>Mail Orders Specially Attended To</p> <p>Phone 16</p>

Here's a half-size reproduction of the "Sports Meeting" folder put out by F.A.C. Squadron No. 2, Cranebrook, Australia. As you can see, the boys staged a real show, charging admission to see the fun. Note the advertisements on either side of their announcements. They paid for the printing.

hear from you pretty soon I'm going to fly to New York and blow up 44th street from Riverside Drive to 1st Avenue. You better do something quick to calm me down or I'll start biting people!"

No doubt many of you fellows have also felt this way; for quite a few letters went unanswered during your old pal's absence. But most of the "old" correspondence has been taken care of by this time; and if any of you fellows are holding any bombs, we trust you'll put 'em back where you got 'em from. Bruce, incidentally, is trying to form a local F.A.C. unit so if any of you fellows in the Notre Dame area are interested be sure to call on him. Have no fear—he's not as dangerous as he sounds!

And here's a letter from S. Eber Wilson, Ft. Wayne, Indiana, which contains food for thought. Although not a G-2 member (because he doesn't have the proper time to devote to the work) Eber has just advised us that he succeeded in getting the Central Branch of the YMCA'S Magazine Department, plus two local drug stores, to handle FLYING ACES. To those Club members who would really like to do something for the F.A.C., but who do not have time for full-fledged G-2 work, this should come as a helpful suggestion. However, when you fellows and gals who are not in G-2 do "land" new accounts, please let us know about it so that we can properly credit you through these columns. Moreover, if you get enough new dealers we'll see that you get some kind of a prize. Fair enough?

Word has just come to us announcing the fact that Col. Robert A. McGinnis, F.A.C. Commander of the Buffalo, N. Y., District, is the proud father of a little girl. Bob tells us that she is a little darling—looks just like her dad. Naturally we of GHQ extend our congratulations, and since Bob is a pretty good looking bird himself we feel that the little girl will someday prove a second Norma Shearer or Marlene Dietrich. And while on the subject of Buffalo, we're proud to announce that both Bob and his brother Edwin have been awarded the D.S.M. in consideration of the extraordinarily fine work they have done for the F.A.C. in Buffalo.

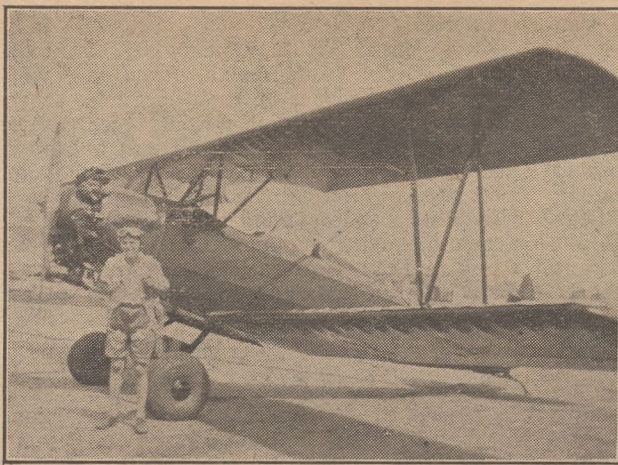
Now for the latest honorary members—

John Lyczkowski, Detroit, Mich., has induced Richard Aldworth, Supt. of the Newark, N. J., Airport to join the Club. John, we're mighty glad indeed to have such honorary members. And Dick, we bid you a most cordial welcome to the F.A.C. tarmac.

Col. Paul R. Guerrero, our old stand-by at Tacoma, Wash., has three-pointed onto our tarmac none other than Henry L. Stimson, along with Mrs. Stimson. As we all know, Mr. Stimson was Secretary of State under President Hoover. Also, he has secured Percy Warner Tinan, Publisher of *Philippine Motor Road & Tourist Guide*, Baguio, P. I. Fine work, Paul.

From far off Sydney, Australia, comes a letter from J. L. Maiden, enclosing a communication from John S. Dunne, Studio Manager of Radio Station 2SM, accepting honorary membership in the F.A.C. Thanks a lot for this membership, "J.L." We understand that Mr. Dunne is an ardent air enthusiast.

We have Dave Wheeler, Morrisville, Vermont, to thank for the honorary membership of Bernarr Macfadden



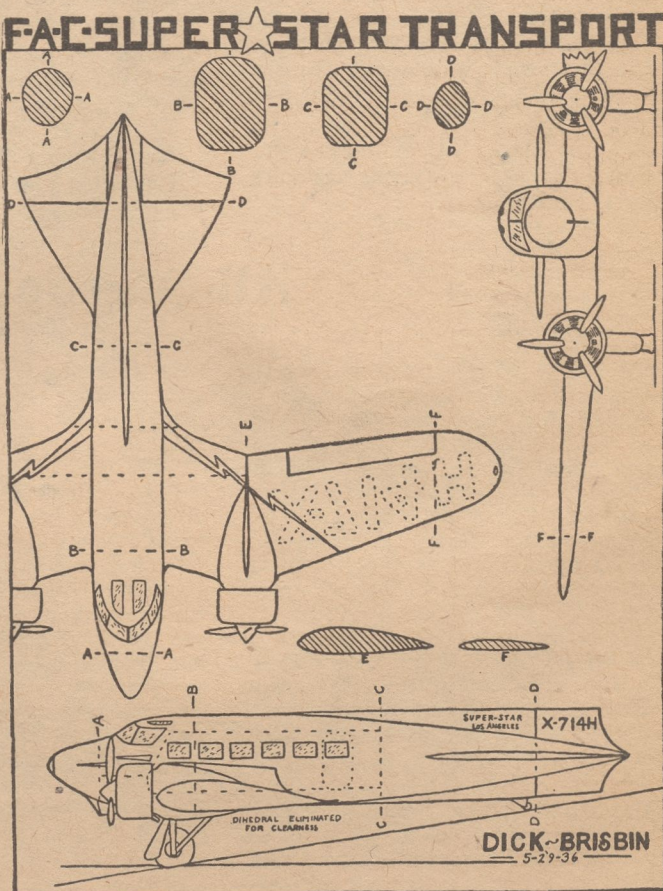
Albert Emanuel, Brookville, Long Island, F.A.C., turned to real planes at about the same age that most fellows begin model building. Young though he is, Al has been piloting a plane for four years, and now he's taking up instrument flying. You'll be envious to know that the plane is his—lock, stock, and empenage!

of the famous Macfadden Publications. As many of you know, Mr. Macfadden is a plane owner himself and has long been interested in aviation.

FOR some time we've pointed out that gas models have been becoming more and more popular, and now we are forming a Gas Model Corps to be known as the F.A.C. G.M.C. Already the following members have signed up: Harry Martin, Brooklyn, N. Y.; Don Marshall, Springfield, Mass.; Joseph Daley, Merchantville, N. J.; Frank Bullock, Devon, Conn.; and James Treber. The last named

failed to give us his address. Let's have it, Jimmie, so that we may complete our records. And while we're about it, there's a swell article in our Model Section this issue all about how to form a gas model club. A word to the wise is sufficient—we know you won't miss it. In the meantime, how about some more of you gas jobbers registering with the F.A.C. G.M.C.?

We're just in receipt of a letter from Emmet Marshall, Jr., Dayton, Ohio, enclosing a card from Laura Ingalls, accepting honorary membership in the F.A.C. We hate to disappoint you, Emmet, old boy, by calling attention to the fact that Laura is already an honorary member



Yep, this is Dick Brisbin's own three-view of his contest-winning F.A.C. "Super-Star" Transport. From these plans, you solid model fans can make an official Club sky-hurler of your own. You'll find a photo of the finished plane on page 31 of your October F.A. Joe, Arch, Herb, and your old friend, Doug, will be "flying" this fine job in the Club News one of these months—and to avoid any more crack-ups, we'll chain Robby, the robot pilot, to the strongest longeron aboard.

of the Club—but you should have great satisfaction in the fact that she sent you that fine photograph of her Lockheed Orion.

Benny Holdsworth, Leeds, Yorkshire, England, has just written us to the effect that he likes the Club News "dished out" by the F.A.C. transport method. He says it makes the reading more fascinating and colorful. Let's hear from more of you on this subject. I'm sure that if enough of you want the news in that form it will not be difficult to get Joe, Arch, and Herb to agree to hop about in the F.A.C. Transport Dick Brisbin designed for us. Benny also tells us that one of his friends heard that we were conducting a transport contest and was quite far advanced with the construction of his model when he got hold of a magazine and learned all about Joe and the Robot pilot. He immediately threw his plane out the window since he knew then that he did not stand a Chinaman's chance of winning—he actually had three robot

pilots in the blamed thing! (Joe please take note!)

Capt. Victor Weber, Commander of F.A.C. Flight "A," Harlan, Iowa, in submitting a report of their meeting, mentions that among other things each member must promise to do his best to get at least one new member by the next regular meeting. Also, each promises to make at least one model airplane a month, buying supplies from advertisers in FLYING ACES. We trust that many other Flights and Squadrons are doing likewise, for you can always depend on materials bought through our pages.

James Royle, Jr., 403 Graham Ave., Paterson, N. J., advises that he is forming an F.A.C. unit in Paterson and would like recruits. Our file of active units in Paterson is certainly nothing to write home about, so we sincerely hope that Jimmie will be successful in his efforts. Let us know how you make out, Jimmie.

Time and again we have mentioned

Willetta Crawford of Hanford, Calif., in these columns, and now we're proud to announce that this young lady intends to enter the Ryan Aero School as soon as possible. We're mighty pleased to learn of this, Willetta. And by the way, girls, we'd like to have more of you follow Willetta's example and tell us of your aero experiences. Come on! Let's have 'em.

From across the Canadian border comes word that Joe Laberge, 215 St. Charles, Sudbury, Ontario, is progressing nicely with his F.A.C. unit. From all accounts, Joe is getting a nice bunch of fellows together, and if you live in the vicinity and are interested in aviation and model building we'd suggest you get in touch with Joe.

Well, F.A.C.'s, from the looks of this "copy" our space is about used up for this time, so we'll sign off now and meet you all on the Club tarmac this time next month. In the meanwhile—keep your club props revving!

—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:

Budd Schulz	David Bartelt
John Huguelet	Mildred Brady
Lewis Wylie	Alfred Perry
Jimmie Hunter	Walter Cockerille

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:

Chester X. Mroz	E. W. Putney, Jr.
Emanuel Taylor	William Kaempfer
Albert Caltune	

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:

George Davis, Jr.	Chester Graden
Benjamin Surdi	

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:

K. A. Smith, Jr.	Walter Thomas
Frank Wickersham	Edward Hanson
Charles McBee	Stewart Booth

The following member of G-2, of the Flying Aces Club, has been awarded a pocket knife for exceptional services to

the Club:

Geraldine Pyl

The following member of G-2, of the Flying Aces Club, has been awarded Aviator's Identification Bracelets for additional services to the Club:

John S. McArdle

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:

Warren Hyten	George Pelland
Lionel Racine	Jacob Cooper
Greydon Kay	Fred Parphyrius
Delmont Starks	

All Questions Answered

(Continued from page 17)

shaft. It was fed in by pressure from the tank through a fine-adjustment valve to a carburetor fitted to the end of the hollow main crankshaft. The gasoline mixed with the air, passed along the crankshaft into the crankcase, continued through nine holes set in the thrust box casing, and was sucked up through induction pipes bolted to the thrust-box casing into the cylinders through an ordinary inlet valve.

William Cramsie, New York City:—We have no record of the trip to Bermuda you inquire about. Why not write to the Navy Department for such information?

Roy Moss, Mount Vernon, N.Y.:—Thanks for your long letter. I do not believe the Army autogiro has been seriously considered as a fighting ship, and the points you bring out are obviously true. The rear gunner would have a very small arc of fire, but it would be enough to protect himself if necessary. We be-

lieve the autogiro will be used as a spotter under certain conditions where it will be well protected by fighter outfits.

R. Holt, Sheffield, England:—We were all happy to hear you had passed your examination to enter the Air Force and we shall be looking for more letters from you telling all about your wonderful experiences. We would be glad to get that data on S.E.5 squadron markings you mention, but the other clippings (cuttings to you) are old to us, since we get those British magazines and see them almost as soon as you. Thanks, just the same, though. Props here rotate the same as they do in Britain, anti-clockwise, facing the engine.

Melvin Carro, Revere, Mass.:—The speeds and motors of the following transport planes, as you requested are: Lockheed Electra, 230 top speed on two 440 h.p. Wasp-Juniors; Stinson Tri-

motor (Model A Airliner) three 260 h.p. Lycomings, top speed not announced, cruising speed, 162 m.p.h.; Boeing 247-D, top speed 202 with two 550 h.p. Wasp motors.

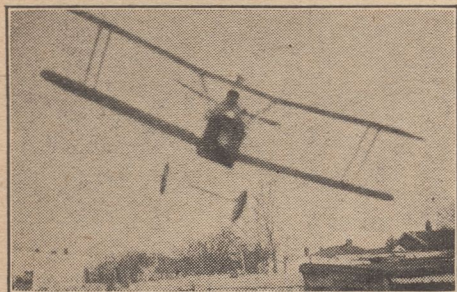
Geoffrey Wick, Helston, Cornwall, England:—We do not know how you can get this magazine regularly—unless you subscribe for it. The stunt you outlined in your letter could be performed by most any acrobatic machine today. We do not know how you could get balsa into the country any cheaper, no matter where you purchased it.

H. Mapleton Telkwa, British Columbia:—The plane shown on the cover you mention is correct. We find that they have tried out many types of undercarriage, the type shown by our artist being one of them. The U. S. Air Service machines used on the Alaska trip were Martin bombers. So it's Queen Charlotte Islands—not Island. Well, you tell

(Continued on page 72)

With the Model Builders

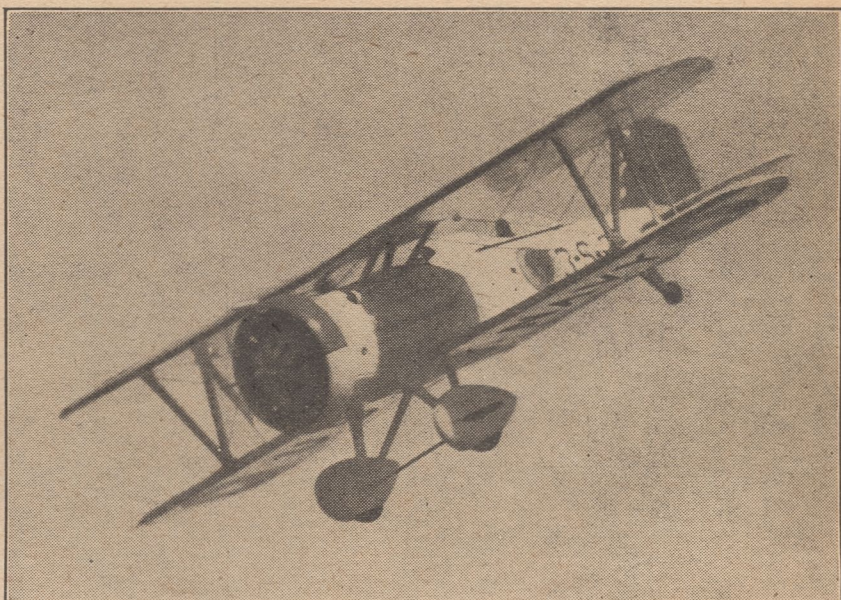
AND THIS MONTH, FANS, THEY'RE ALL IN THE AIR.



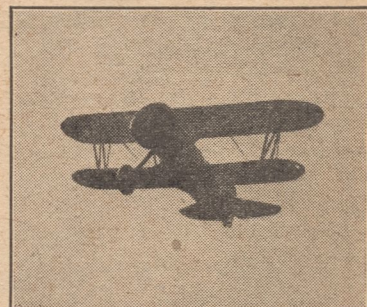
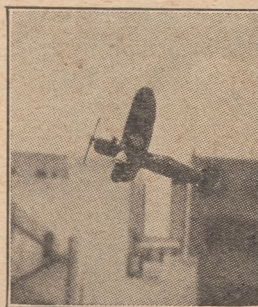
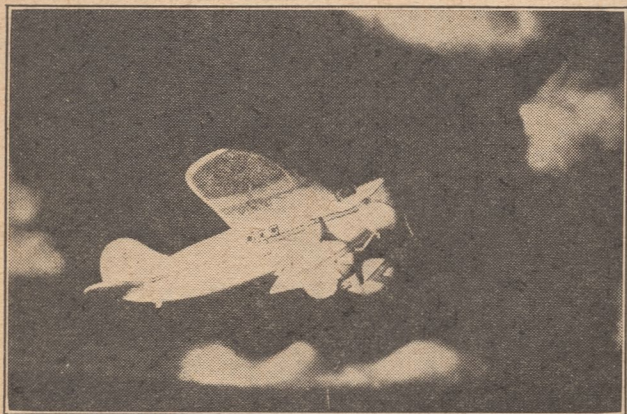
First off, how do you like this hurtling S.E.5? She was built by J. Bryan Crawford, of Christchurch, New Zealand, and we're right here to say she looks mighty dashing in the air. Zip-p-p-p!



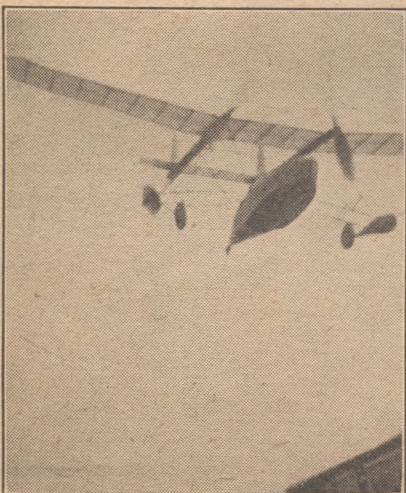
And here's another one from "'way down under"—a swell sky view of a Hawker Fury model. C. Kerr, of Queensland, Australia, was the builder and photographer. A truly sweet "shot"!



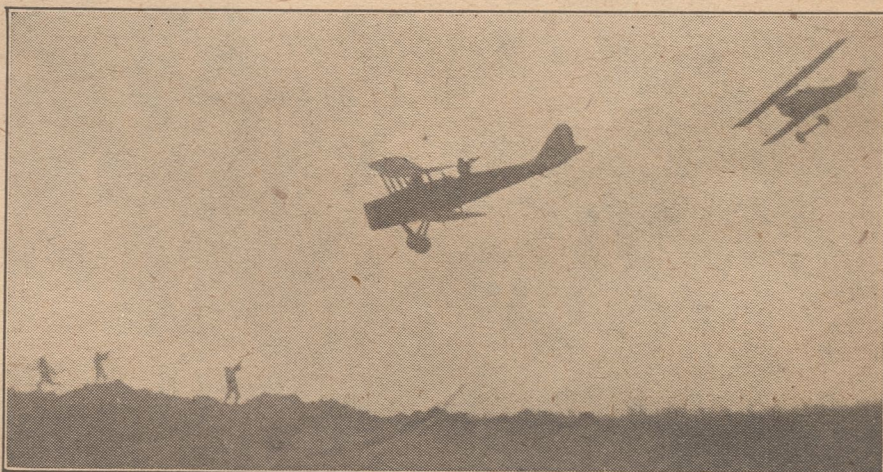
That talented Urquhart family up in Binghamton, N. Y., sent in this dramatic sky diving photo. The model is a striking Vought Corsair built by Jimmy U., and the fine camera work is to be credited to Papa U. There's speed, action, and keen detail aplenty here. We rate this the tip-top "shot" of the month.



Left: Still another from across the Pacific—Wiley Post's Lockheed Vega "Winnie Mae" turned out by Roy V. Symonds, of Hastings, New Zealand. Those realistic cloud effects were "engineered" by spotting bits of cotton on a black velvet back-drop. Left above: Pipe the Consolidated Fleetster in action! All the way from South Africa, too. Ralph Carroll, of Johannesburg turned 'er out. Grand work, Ralph, old boy! Right above: And here's a majestic view of a model Boeing F4B-4 flown by R. B. Ritter, Jr., of Milwaukee. Ritter tells us this speeding job is complete in every detail. He's also got a Dewoitine in his hangar that we hope to show you fans sometime.



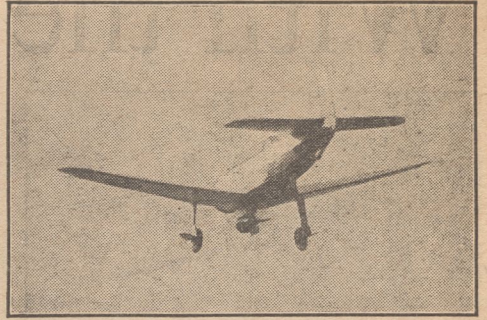
Ba-bee! Isn't this a darby! Yes sir, a real flying amphibian model right off the tarmac of Bill McLean, of West Ashville, N. C. Note the outrigger pontoon-and-wheel carriage he's fitted to the ship. We like this one a lot!



And now for a top-notch scenic action layout. Yep, you guessed it—our old friend, Peter Bowers, of Los Angeles, was responsible for this excellent setting and photography. It shows you what Western Front scrapping looked like. A darting Fokker D-7 is chasing a D.H.4, and Jerry infantrymen below are taking some pot shots to make matters even more exciting for the Allied airmen. You certainly know your stuff, Peter!

SWISH! You can just hear her tearing by as the camera clicks! We expected to catch a front view, but before we could snap the shutter she showed us her tail.

Clear your benches for action, fellows! For here comes another A-1, sky-hurting military model—the Army's great Vultee Attack-Bomber. Its prototype is one of the sweetest ships in the Service—and you'll find that in like fashion this trim balsa job won't take any craft's prop wash on the model tarmac, either. She's one of Bill Winter's neatest products. Go to it, fans—and good luck!



Make the Vultee Attack

THE new military Vultee Attack Bomber embodies the

high speed and maneuverability of the attack ship, with the range and load carrying ability of the bomber. As an attack job the gross weight is 8,500 lbs., and as a bomber 10,800. The high speeds of the attack and bomber respectively (at 11,000 ft.) are 230 and 209 m.p.h. The attack has a maximum ceiling of 26,000 ft. and a range of 900 miles. The bomber can climb to 21,600 ft. and can cruise for 2,200 miles.

Our model is closely patterned after the original—and it inherits much of its speed. Because of its striking appearance and flying capabilities, this little ship is well worth the time expended in its construction.

The method of construction utilized calls for four master stringers cut to shape from sheet balsa. Thus even the beginner may easily build an accurate model.

By William Winter

sheet the enclosure formers. Trace the top, side and bottom outlines of

the fuselage on 1/16" sheet balsa and cut the master stringers, allowing the required depths at the various stations.

Cement the two side master stringers in place on the widest bulkheads and after allowing time for the cement to set locate the remaining smaller bulkheads to the rear. Cement the enclosure formers in position and complete the superstructure. The one piece bottom master stringer and the small top master stringer are then slid into place in the notches provided for the purpose. The auxiliary stringers are glued in place in the notches required for them and previously marked, being cut as the work progresses. The stub ribs are cut to the shape shown from 1/16" sheet and are integral with the fuselage structure.

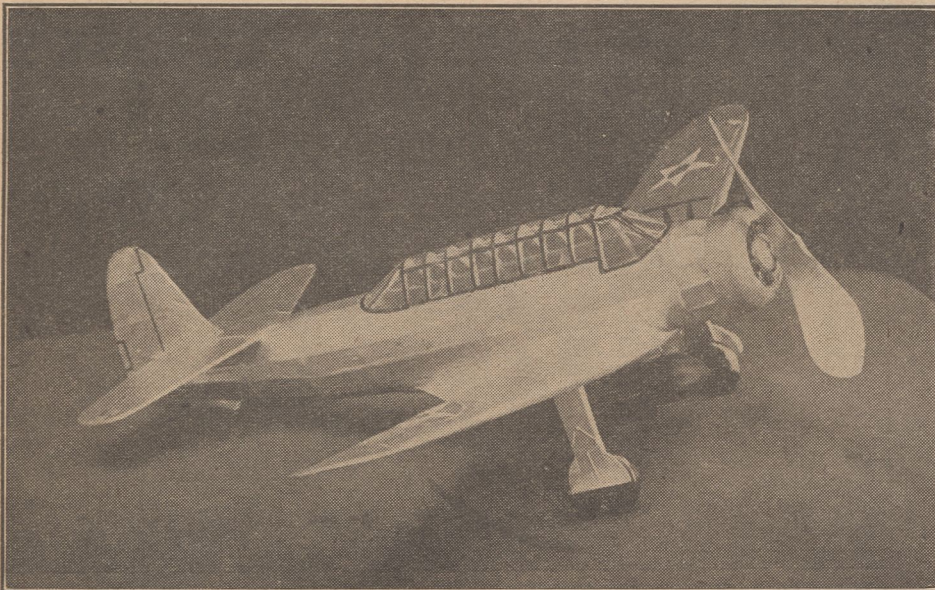
Block "A," shown in detail as well as on both top and side views, is cut to the required shape from a block 2 1/8" sq. by 11/16". Block "B," also given in detail, measures 1 5/8" by 3/4" by 1 15/16". Note that this block is cut out to form the front shape of the enclosure. A lip or raised edge is noticeable on the various views as

well as in the detail. The thickness of the walls after hollowing should not exceed 1/8". Block "C" is saddle-shaped so that it fits entirely around the bottom of the fuselage to form the wing fillet on both sides. This block when carved is slid upward between the stub ribs until it fits in position. A sheet of 1/32" is next bent around this portion of the fuselage as seen on the side view so that a close fit of this block may be made. The required block size is 2 15/16" by 11/16" by 7/8".

The stabilizer fillet block is shaped in accordance with the three cross sections given. It is fitted in the same manner as Block "C" and the wing fillet block were fitted. Stabilizer stub ribs are cut to the required shape and are built into the fuselage. The stabilizer

FUSELAGE

USING the patterns given, cut all the bulkheads to shape from 1/16" sheet balsa, cutting only the notches for the master stringers. Accurately mark the positions of the auxiliary stringers. Also cut from 1/32"



Detail—and plenty of it! That's what makes the Vultee a top-notch for display as well as for flying. Note the gun-sight mounted on the cowl and the realistic bomb slung on the rack beneath the fuselage. "She's got everything!" you say. "Boy, you said it!" say we.

fillet block should measure $1\frac{11}{16}$ " by $1\frac{1}{2}$ " by $\frac{13}{16}$ " before carving.

It is necessary to bend $\frac{1}{32}$ " sheet balsa around that section of the fuselage directly forward of No. 6 bulkhead and to cut it out to form the outline of the rear portion of the enclosure as seen on both top and side views.

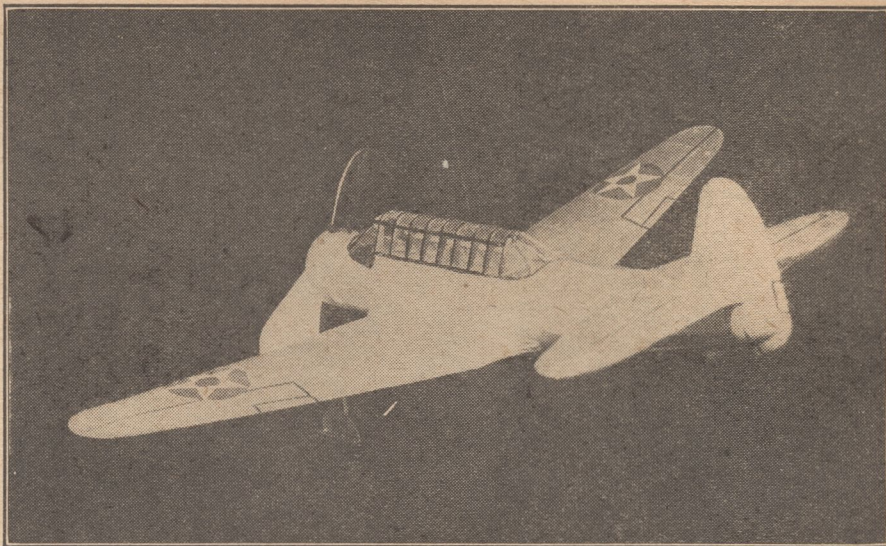
To cover use narrow strips of superfine tissue running longitudinally. Their widths depend on your judgment of the particular section to be covered. The structure is strong enough to permit a taut tightening by spraying. Complete the covering with a smooth coat of clear dope.

The tail wheel housing is cut to shape, as shown on the side view, from $\frac{1}{4}$ " sheet. The front portion is left wide enough to accommodate the $\frac{7}{16}$ " tail wheel. The whole tail plug assembly, shown on the side view, is also given in detail. The cone piece proper is shaped from a block $\frac{15}{16}$ " sq. by $\frac{15}{16}$ ". Its front face is a piece of $\frac{1}{8}$ " sheet. The upper and lower appended structural pieces form part of the rudder surface. They are shaped to the profile shown from $\frac{1}{4}$ " sheet and tapered as shown in the tail plug detail. A square piece of $\frac{1}{8}$ " sheet is cemented to the face of the otherwise completed plug so that the unit will remain in place at all times. The rear hook is bent to shape from .028 wire and is forced through the plug and embedded in it to permit the use of a winder. A scale bomb and sight are to be found on the plan.

TAIL SURFACES

THE main spars of the tail and all the crosspieces, with the exception of those that form the contact with the fuselage, are $\frac{1}{32}$ " by $\frac{3}{16}$ ". They can be stripped from $\frac{1}{32}$ " sheet if the size specified is unavailable. The exception noted calls for $\frac{1}{16}$ " by $\frac{3}{16}$ " stock. The tips are preferably scant $\frac{1}{16}$ " sq. bamboo bent to the desired shapes around a candle flame. As the rudder and stabilizer surfaces are tapered, their front views have been included on the plans.

Cover each side of both stabilizer halves and rudder with one piece of tissue. If it is desired to spray the finished surfaces, do so lightly. Finish the surface with a coat of clear dope. Cement the stabilizer halves to the stub ribs with thickened cement and hold in position until the cement has set. Glue the rudder in position in the same manner. Be sure not to cement the rear lower portion of the rudder to the tail plug. Finally, cement the $\frac{1}{32}$ " sheet rear stabilizer edge fillets in place.



There's certainly lots of dash in this striking model. That's quickly seen in this excellent rear-quarter "shot" which brings out the fine sweep of the wings. The interesting construction of the tail is also shown to advantage in this view.

WINGS

OUR wings are built in two pieces, one left and one right. They are to be attached to their respective stub ribs after they have been finished complete with the built-in landing gear. All the ribs shown, with the exception of the first, are of $\frac{1}{32}$ " sheet. The excepted ribs are $\frac{1}{16}$ " sheet. The spars are cut from $\frac{1}{16}$ " sheet to agree with the pattern shown in black on the front view of the wing. The leading edges are $\frac{3}{32}$ " half-round and are fitted into the leading edge notches provided for the purpose.

The trailing edge is a pointed section shaped and sanded from $\frac{1}{8}$ " by $\frac{3}{16}$ " stock. The wing tips are formed by bending $\frac{1}{16}$ " sq. bamboo to form around a candle flame. Small pieces of $\frac{1}{16}$ " sq. are cemented in place between the first two ribs of either wing panel on both upper and lower surfaces.

It is of the greatest importance that the first rib be slanted as shown for dihedral and that the amount of slant be not less than called for. A reasonable amount of extra dihedral will be more of an aid than a detriment to the flying qualities.

Two sectional ribs of $\frac{1}{16}$ " sheet marked "Z" are provided to form the attachment facilities for the landing gear. The lower portion of the wing between the second and third ribs is covered on either side of the pieces designated "Z" with $\frac{1}{16}$ " sheet so that the whole cannot be twisted out of place under landing or crash impacts. The landing gear strut will later be slid between these two rib pieces to its proper position.

Use one piece of tissue for each surface of both wing panels. Spray lightly and dope evenly. Attach each

(Continued on page 95)

BILL OF MATERIALS

STRIP Balsa

Five pieces $\frac{1}{16}$ " sq. by 36";
Two pieces $\frac{1}{32}$ " by $\frac{3}{16}$ " by 24";
One piece 6" by $\frac{1}{16}$ " by $\frac{3}{16}$ ";
One piece $\frac{3}{32}$ " sq. by 24";
One piece $\frac{1}{8}$ " by $\frac{3}{16}$ " by 24";
One piece $\frac{1}{4}$ " sq. by 2".

SHEET Balsa

One piece $\frac{1}{16}$ " by 2" by 36";
One piece $\frac{1}{32}$ " by 2" by 24";
One piece $\frac{1}{4}$ " by 3" by 12";
One piece $\frac{3}{32}$ " by 2" by 3";

One piece $\frac{1}{8}$ " by 2" sq.

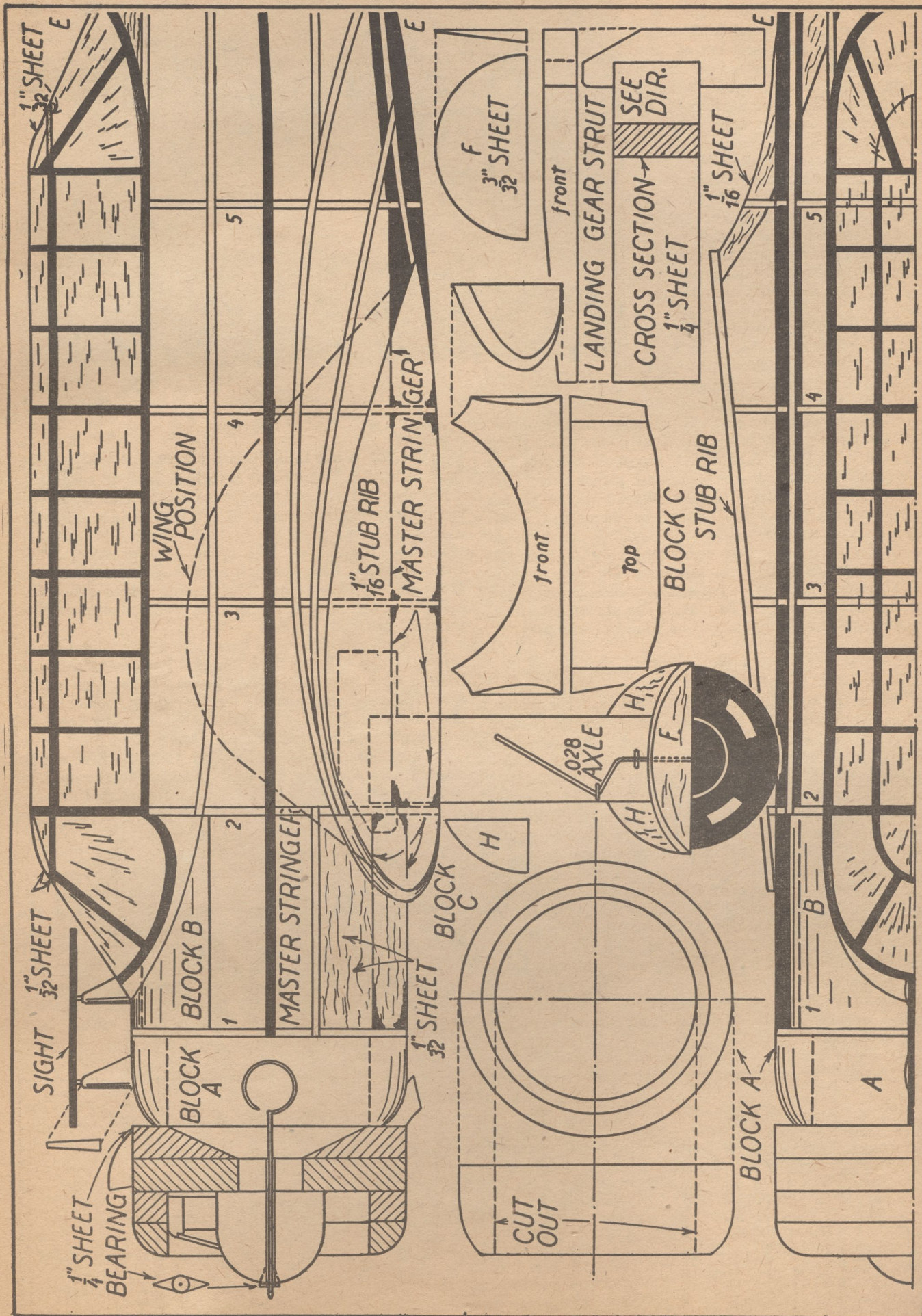
BLOCK Balsa

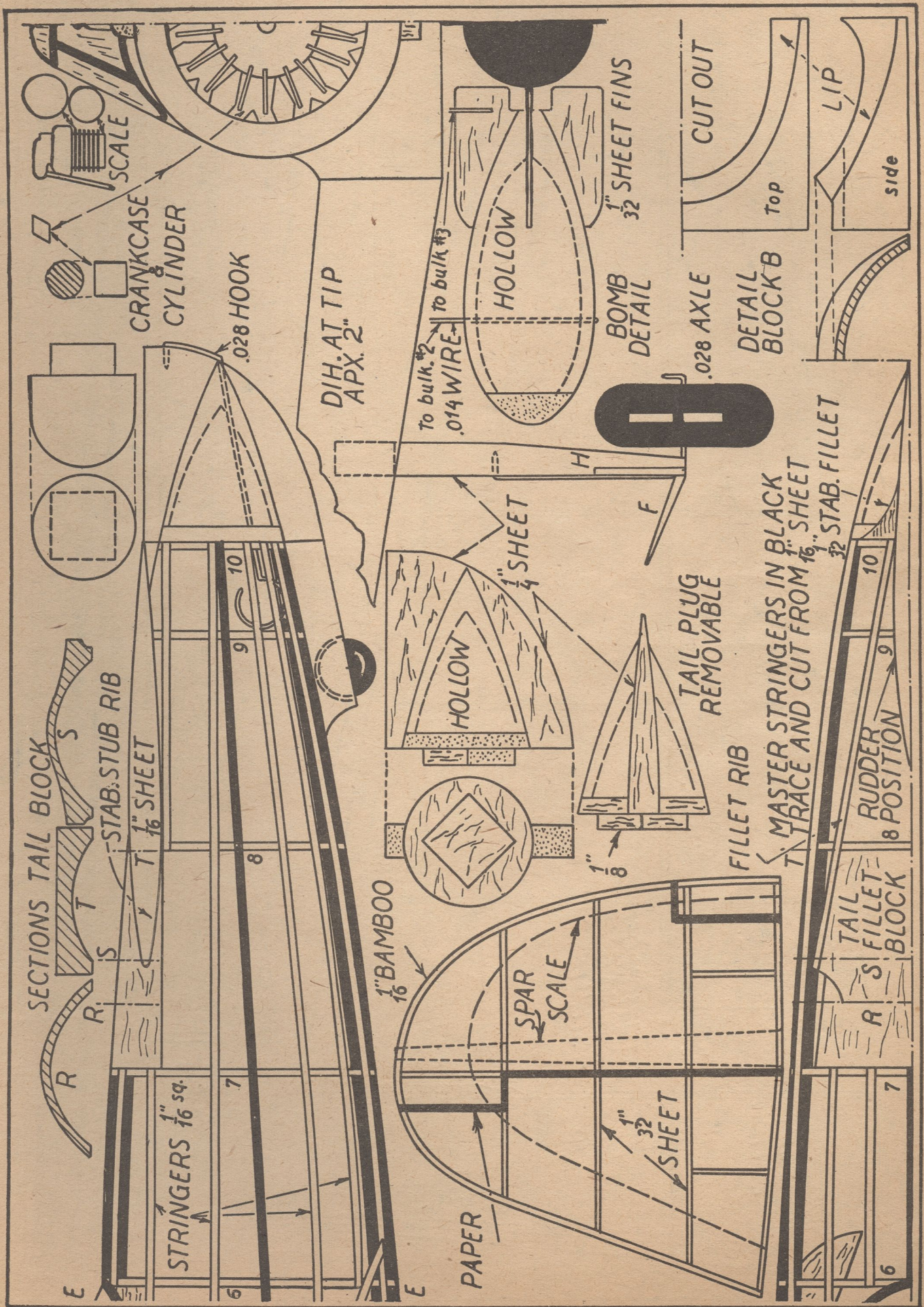
One piece $\frac{15}{16}$ " by $\frac{15}{16}$ " sq.;
One piece $2\frac{1}{8}$ " sq. by $\frac{11}{16}$ ";
One piece $1\frac{5}{8}$ " by $\frac{3}{4}$ " by $1\frac{15}{16}$ ";
One piece $2\frac{5}{16}$ " by $\frac{7}{8}$ " by $\frac{11}{16}$ ";
One piece $1\frac{11}{16}$ " by $1\frac{1}{2}$ " by $\frac{13}{16}$ ";
One piece $2\frac{1}{2}$ " by 1" sq.;
One piece $\frac{13}{16}$ " sq. by $1\frac{11}{16}$ ".

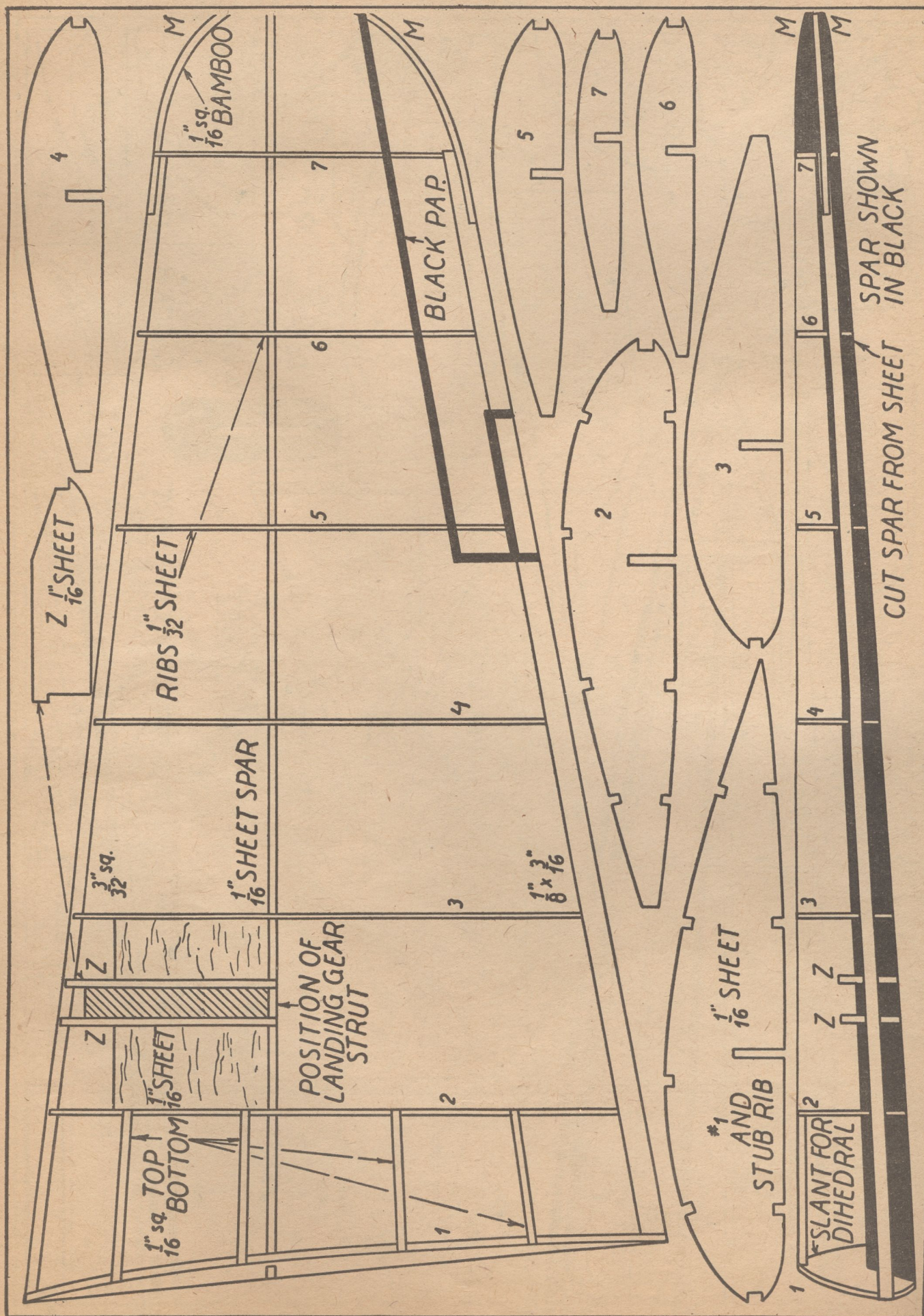
MISCELLANEOUS

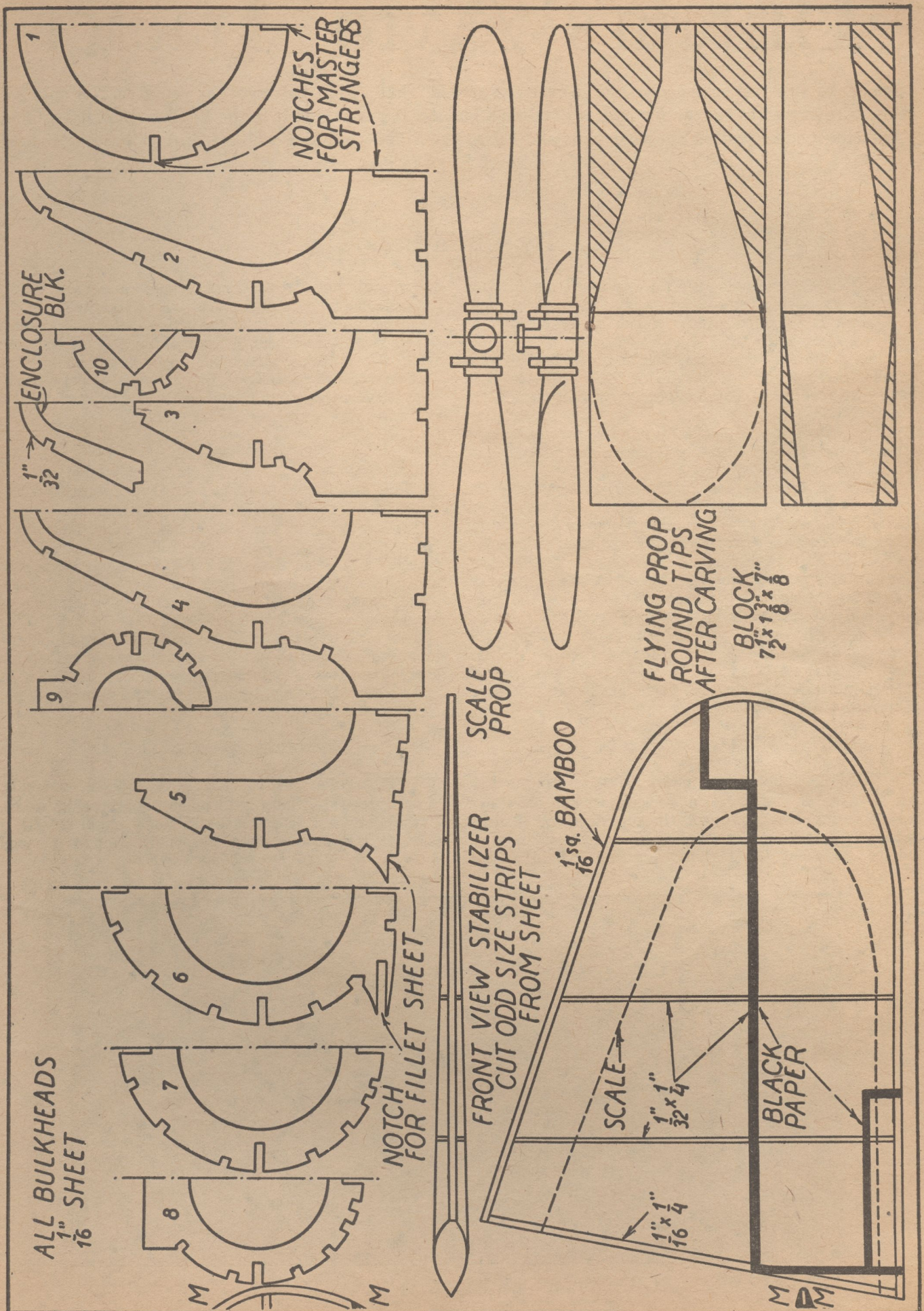
One ounce of cement;
Two ounces of clear dope;

One sheet superfine white tissue;
One pair $1\frac{3}{8}$ " wheels;
One tail wheel (approx. $1\frac{1}{2}$ ");
Cellophane;
One foot of .028 wire;
Two feet of .014 wire;
One piece $\frac{1}{16}$ " by $\frac{1}{4}$ " bamboo;
Six feet $\frac{1}{8}$ " flat rubber;
Bronzing liquid and silver bronzing powder;
Silver paper, or silver or aluminum paint.









Britain's Avro Trainer

One of the sweetest solid-scalers we've ever run across! That's what we've got for you here. Not only has this Avro proved to be tops for military training, but it's also won laurels in the English sport flying field. And once you've trotted out your tools and balsa, you'll find that she can't be beat in the model field, either! So go to it—

By Chris Lessy

WITH war clouds over Europe, and Great Britain increasing her air force, some of you may have asked the question: "What kind of ships do British flyers train in?"

One of the answers is the British Avro Trainer presented herewith. It's a wonderful little ship—in fact, many of them have been bought by private owners for sport flying.

The Trainer is equipped with wing slots, which make it virtually stall-proof and also enable the pilot to land in a limited area.

The dual controls and instruments are exactly the same in both pits, so if a student tries the other "office" he won't have to hunt all over the cockpit for compass, switch, and the like, in an emergency.

Steel tubing construction is employed in the fuselage in a very novel way; for three different diameters of tubing are used. The largest diameter is at the front end and extends back to the second cockpit; the next in size continues from there to a point halfway back to the tail; and the smaller tubing brings up the tail end. These three "sections" telescope into each other at the joints where they are welded. All joints are reinforced with finger-plates.

FUSELAGE AND WINGS

NOW, let's build our model. First, trace the side view of the body on a block of soft balsa and carve it out. Next, trace on the top view and likewise carve it out. Your fuselage will now have a "square" shape; so, using the sections A-A and B-B as guides,

round out your work. Sand smooth and then paint.

While the body is drying, cut out the wings from $\frac{1}{8}$ " sheet balsa and sand to wing section C-C. With a sharp pencil point, mark out a groove for the aileron and wing slot outlines. Crack the top-wing at the center section for dihedral. Give the wings a smooth finish with sand paper; paint, and set away to dry. Follow the same procedure for the tail surfaces.

LANDING GEAR

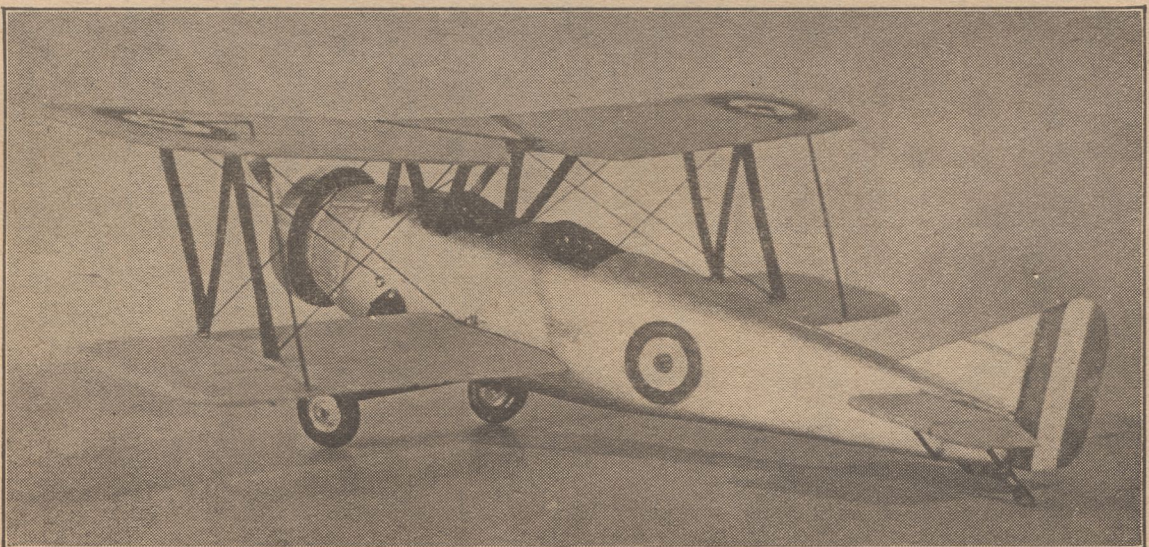
NEXT make the landing gear from pieces of scrap balsa. First construct the shock-absorber strut. If you are going to make wheel pants, carve them from two pieces of $\frac{1}{8}$ " sheet balsa. Hollow out, attach the wheels to it—and there you are. Cement to fuselage and pin in place to dry, then add the other undercarriage struts. The tail skid can either be bent from bamboo or carved from hard balsa.

The wing struts should be no trouble at all. Make them from balsa and sand to streamline shape. Be sure that all parts are painted first and then assemble in this order: Landing gear, tail surfaces, lower wing, wing struts, top wing.

WINDSHIELDS, BRACES, AND PROP

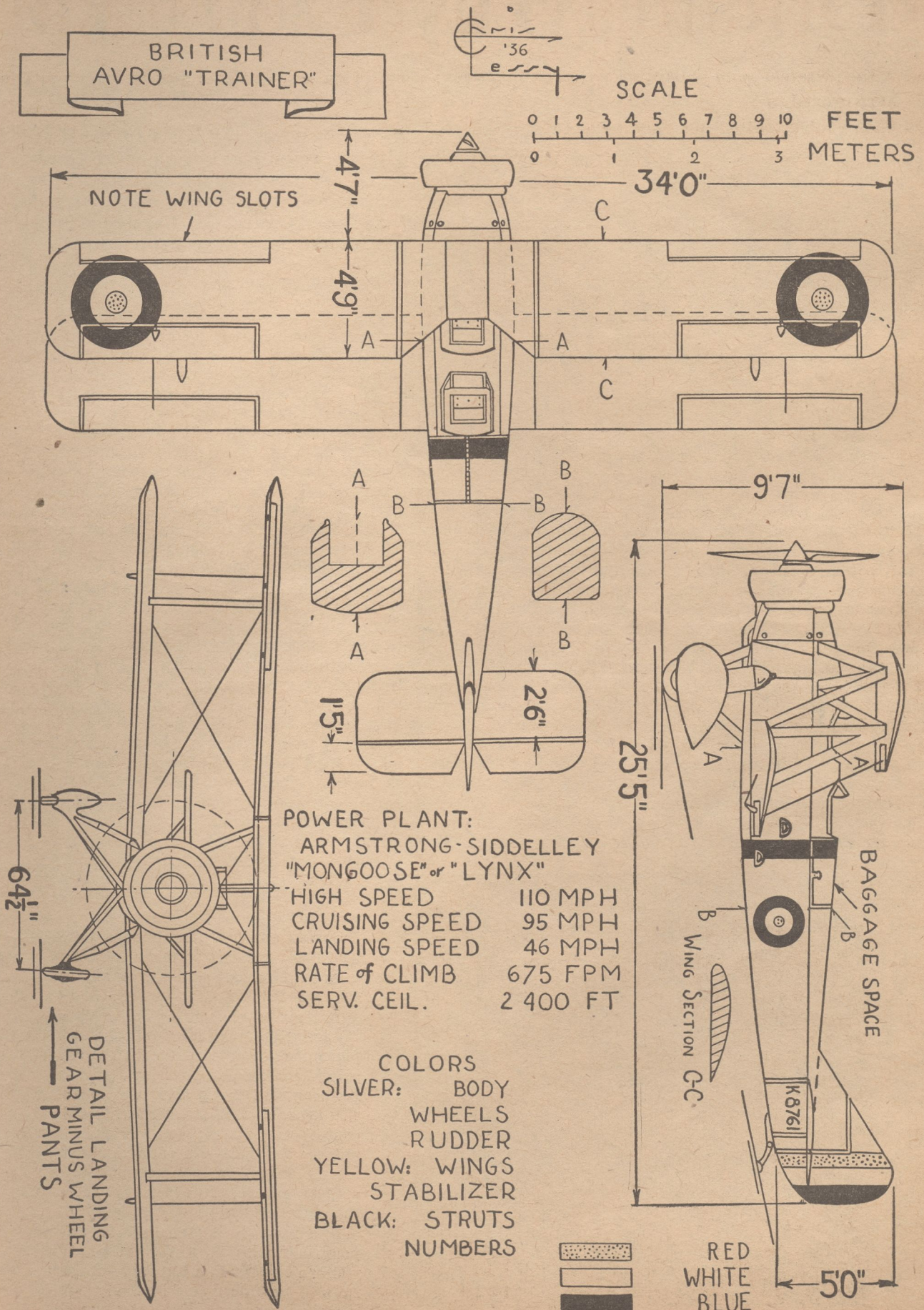
USE celluloid or cellophane for the windshields. Shredded bamboo will make your bracing wires. Carve a wooden prop for the ship and equip it with a boss. In ink, outline metal-tips on it. Paint a natural

(Continued on page 95)



All of you fans will agree that this Avro Trainer model is an ace-high job—the kind of ship that rates the blue ribbon on any man's tarmac. The full details of this keen little craft are shown in this excellent photo. So keep it handy for checking purposes when you construct your own Trainer.

PLANS FOR BRITAIN'S AVRO TRAINER





Introducing the author. He was so interested in our idea of putting over the gas club idea, that he hopped a United Air Lines Boeing and flew east to talk it over with us. Here he is alighting at Newark Airport.

Why Don't You

IT'S A GREAT IDEA—AND HERE'S HOW!

Are you fellows looking for some real thrills? If so, you'll find the gas job game packed with 'em. To get the most out of this fascinating sport, you should "join up" with other motor modelers. So to give you the full "dope" on starting a high-revving outfit, we called on Pat Sweeney, head of the famed Central Gas Modelplane Society of Chicago. Here's his story and it's got everything!

By Pat Sweeney

President of the Central Gas Modelplane Society

YES sir, motor job fans. Why don't you start your own gas model group? You know as well as I that the most fun you ever had was when you joined forces with the other fellows and had that fun together. Of course, you could continue to fly your model alone, and she might perform swell, too. But the other fellow hasn't seen it. And when you tell him how it flew, he says, "Phooey," with a capital "F," and you—oh, well, you say to yourself, "There ain't no justice!"

The point is that all the fun in the model game is more than doubled when you can "go it" with the bunch. You soon find that you don't have to win the club contests to have fun, either. You get the other fellow's slant on building, and he gets yours. You help him, and he helps you. And together you all have a swell time in one of the grandest hobbies that ever was.

I can well imagine that you have a lot of questions to ask about starting a club. "What should I do?" you say.

"And whom should I see about forming an outfit?"

Well, to begin with, let's talk about the "makin's" of a club. We'd say that there are three things you must decide, (1)—The number of officers the group will have; (2)—The rules and regulations by which the club shall be governed; and (3)—The purpose for which the organization is founded. When you have done this, should you need any advice from anyone, you might call upon your school athletic director, your scoutmaster, your pastor, or any man in town interested in sports and hobbies. Such men will be only too glad to aid you. They all understand what teamwork means as well as loyalty and sportsmanship. Now, get all your information on getting started and put your organization down on paper. Go over it again and again so that you obtain a complete understanding of what you are doing.

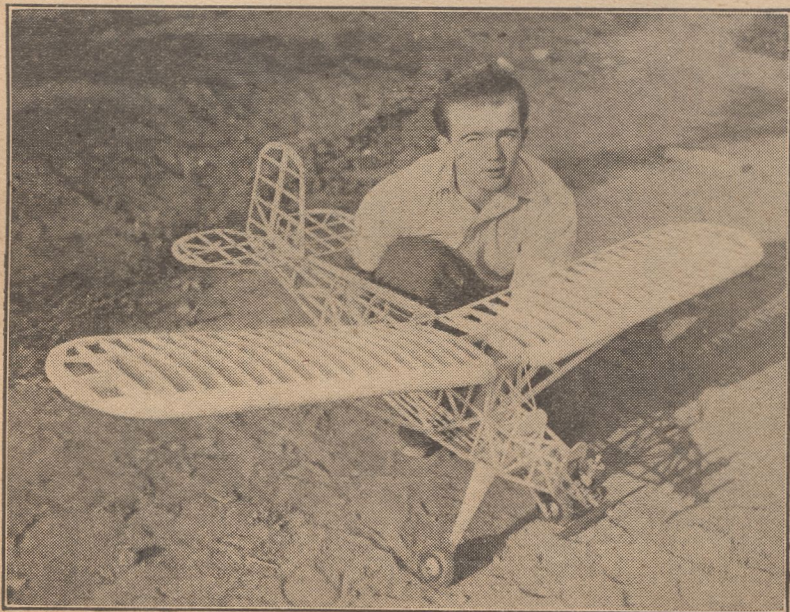
When you have completed the written set-up, decide upon a central meeting place and post this chart on the wall. Bring all the fellows that are willing to join and let them read it so that they will understand just what they are getting into. Explain the whole layout to them so they won't "squawk" about rules and regulations which don't suit them after they're in.

With the club under way, be sure to have regular elections of officers—and make certain that you elect persons strictly on their ability to perform their duties. Emphatically, it is in the election of the proper officers that the success of your club will lie.

It is also evident that any going club must collect dues from its members. These dues need not be large—it all depends upon the size and purpose of the organization. The main point is to make the collections at regular intervals and above all, *keep them up to date.*

After the club is established, expansion of activities will no doubt necessitate appointment of special committees of clubsters selected according to their aptitude in performing the work assigned to them. You will probably find that you will need, (1)—A contest committee; (2)—A publicity committee; and (3)—An entertainment committee. In any event, your committeemen must cooperate closely in order that the affairs of the club be handled efficiently.

And now for a warning: In any and all your activities do not start anything that you can't finish in a big way—for one single failure, such as a contest being run off in a slipshod manner, will cost your club more prestige than you can imagine. Worse than that, it always requires several subsequent



This is Stanley Horn, one of the most active members of the C.G.M.S. "He's done plenty of 'blowing,'" Mr. Sweeney tells us, "since finishing that swell Rearwin Sportster." Well, Stan, we don't blame you a bit. That's one of the best jobs of model construction we've ever seen.

Form a Gas Model Club?

successes to restore that lost prestige. That is a big point to bear in mind, for many a club with a noble purpose has failed because of bungling on the part of the committees in charge of activities. So when you have a club, see that all the boys attend to the tasks assigned them, especially at contests.

OF course, when you're first appointed on a committee to arrange for the "gang" to go to the airport for a little model flying, you may think it's plenty tough. You are scared to death at first—then you kind of think it over, realize your responsibility, pull yourself together, and off you go to the airport manager. Perhaps you can get the "low-down" on the "bird" before you go to see him, and if you think that he's a tough nut to crack, have an older friend call him up before hand and tell him your coming out to see him.

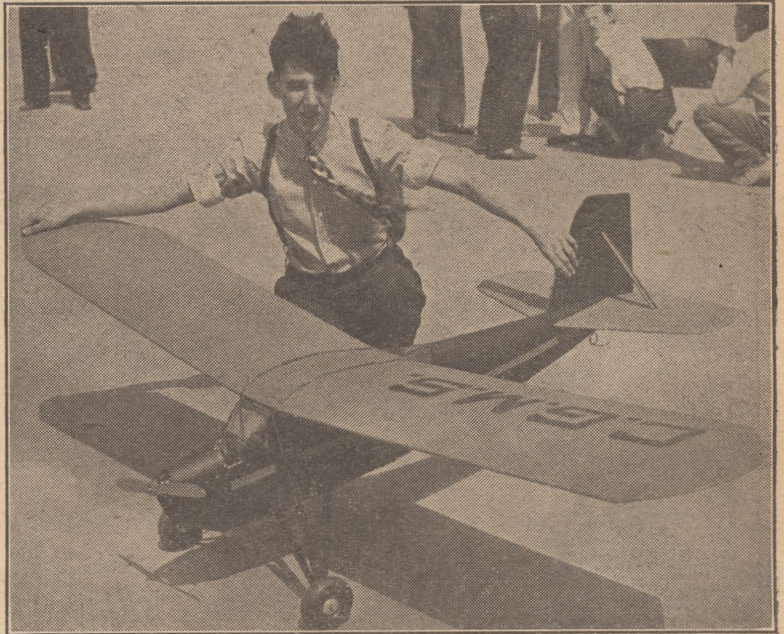
With everything set, you go up to the airport managers' office, get up your nerve, and march in.

"What can I do for you?" he'll probably say.

"Well . . . er . . . that is . . . gulp . . ." you may begin. But then you'll snap out of it and say: "Sir, I'm from the Thus-And-So Gas Model Club; and as a committeeman, I'm here to see if I can arrange for our members to visit your airport, see the hangars and planes, and perhaps have one of your men give us a little talk on what's what. And we'd also like you to give us permission to hold a gas model meet on your field."

Well, the manager will look you over, remember the time he was your age, and say, "That's swell." Then he no doubt will go on to tell you what day to come and the time.

You see, airports are more than glad to cooperate with any club or organization when they pay a visit to the airport. But the field manager wants an even "break," that is, he wants to talk it over with a representative from the club in order to make arrangements to care for the boys. When this procedure is followed, I am sure that your outfit will enjoy a thoroughly conducted tour of the airport and all its facilities—and no doubt something will be doped out in the way of



Here's James Kelly with his first model—and what a beauty it is! "He proved to us," says the author, "that with careful workmanship one's initial craft can be a real bell-ringer." This one flies like an Army pursuit. Keep your knee on it, Jimmie, or it'll get away from you.

field space for your contest. Then you'll be all set.

But if you suddenly decided to go out there in a group without any previous arrangements, don't be surprised if you're stopped at the gate, because airport people are generally pretty busy. Knowing nothing of your coming, they probably can't take time out to accommodate you. When you have made a previous arrangement, though, they will receive you, show you around, and even let you take pictures. Then you begin to feel like a real club. Later, after you have held a few successful contests, people will start to talk favorably about your outfit and invite you to participate in various public affairs where organizations display their hobbies and demonstrate what they can do. And when you have a booth in one of these places, believe me, the people gather around and ask plenty of questions. In answering them you are doing a lot to make the public more airminded.

As you progress you will find that people will be asking for displays of models for their store windows. I recall last year how one of the large Chicago theaters asked for a display in connection with an air movie. We all got together and made one up, a whiz of a one. The result was that the entire club went to the show as guests of the management. The same happens at county fairs, amusement parks, auto shows, and the like. Many stores, too, want nice models to "pretty up" their window displays. Of course, they'll allow you to tag on names of the builder and club.

After you have made use of this display medium several times, it will not be difficult for you to go out and get some person to donate prizes or trophies for your contests.



A scene at the Society's big contest held last May at Hines Hospital Airport west of Chicago. More than 15,000 enthusiastic spectators saw this meet—proving that the club's publicity committee knows its stuff. Note the public-address loud speakers on the scaffolding in the right background.



Thar she flies, boys! And there's power in every line of her. Al Thorwaldsen (right) is the owner. Jack Canary, another C.G.M.S. member, is playing the part of take-off assistant.

NOW in regards to a meeting place for your bunch, a number of halls or club rooms should be easily obtained. If, however, you find it difficult to secure the use of a club room immediately, your first few meetings can be held in the basement of one of the members home or perhaps in "Bill Smith's" barn.

Always insist upon one thing at your meetings—that is that you are meeting in the interests of model building, talking over your plans, getting the other fellow's views, and giving yours. In other words, don't start talking about the swell program you heard on the radio last night or about the movie you saw the other day, or about the funny sayings of "John Jones." Such things can wait.

As for membership cards and pins, a number of things may be done to get them. You may, after the club is well established, all chip in and get them; or better still, you can make your club a chapter of some well-known organization. That means you could call yourselves by their names, such as, the "Little Rock Eagles Chapter of the F.A.C."

In connection with drawing up your rules and by-laws you should be able to get excellent advice from your local Lions Club, Kiwanis, Rotary, Knights of Columbus, Masonic Lodge, American Legion Post or a host of others.

The main thing to do is go out and tell people what you want to do. Explain to them what your plans are. When they find out that you really mean business it will not be difficult to get cooperation from anybody.

When things are on a going basis, it is advisable to send photos and other information of your club to your favorite aviation magazine. This will tell other aero fans of your club and what you are doing. It will also bolster interest in your own group.

You need not worry about prizes for your first contest. The fellows who are interested in going ahead will be more interested in the success of the

club than in prizes. However, be sure to keep a record of the winners at all times.

Gasoline powered models, we know, are not so very old. But few hobbies have grown so fast as that of powered miniature craft—if you can call a six-foot span job a miniature. One little thing, we admit, makes it difficult for many boys to participate in this hobby—lack of cash. And that's where the club idea comes in. A number of you can band together to finance your first motored model. As time goes on, you can add more ships—and anyhow, prices on gas engines will no doubt come down as more people buy 'em. Mass production, you know.

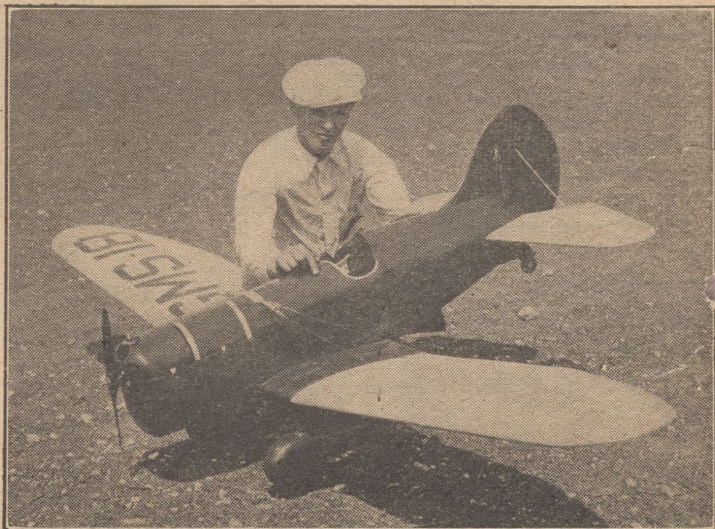
Always remember, too, that the model game is the top-notch way to learn about the aeronautics field. I don't know, of course, how many of you will pursue a career in aviation, but I can safely say that no matter what you do in later life, aviation in some way will directly concern you; for no business is growing bigger any faster. Figures prove that in dramatic fashion. In 1935, for example, an average of more than 1,000 persons and 12 tons of mail were being carried every second of the day on established U.S. airlines. Figure the total out for one year, and the passengers and tonnage carried will astound you.

The international record for miles flown is held by United Air Lines; for they've flown 100,000,000 miles in the last ten years, the equivalent of 4000 trips around the world or about 208 round trips to the moon. Boy, and if that's not covering mileage, then what is? I'll add here that on my recent trip to New York over United Air Lines, I was amazed at the speed set up by the Boeing. I left Chicago at 9:00 a.m. in the morning, and I was in New York headed for the office of FLYING ACES in just 3 hours and 55 minutes! It was a wonderful trip, to say nothing of the time it saved me. Air travel is by far the cheapest form of transportation when you consider the time element.

NOW I'm going to tell you about our Central Gas Modelplane Society—for there's no better way to explain the inside workings of a gas job club.

The Central Gas Modelplane Society, recognized throughout the world as one of the first and most successful gas model clubs, was originated in the Fall of 1935. It now operates under a state charter. And here's how the C.G.M.S. functions:

To begin with, the purpose of this club is to promote
(Continued on page 93)



John Vistarta was one member of the Society who had courage enough to build a low-wing job. He learned a big lesson from this classy Gee-Bee—that was, "Lay off low-wing ships!" Even so, it flew. And just think of all the solid model contests you could win with it!

TRY A SOLID MODEL OF THE PASPED SKYLARK

PASPED SKYLARK
WARNER SCARAB 125 H.P.

- PERFORMANCE -
MAX. SPEED... 139 M.P.H.
CRUIS. SPEED... 125 M.P.H.
LAND. SPEED... 35 M.P.H.
CLIMB 850 FT. MIN.
SERVICE CEIL... 19,000 FT.
RANGE ... 850 MILES

CENTER
SECTION
OF WING
IS DURAL
COVERED.
OUTER WING
PANELS ARE
FABRIC
COVERED.
ALL-METAL
FLAP UNDER
CENTER
SECTION

CROSS SECTIONS
OF TAIL SURFACES,
WING, & FUSELAGE.

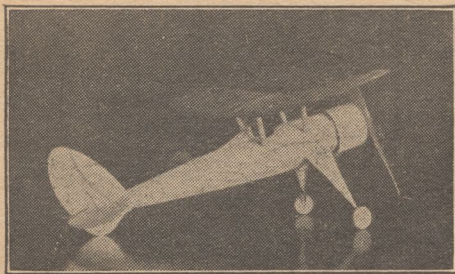
AA

TWO-PLACE
WIRE BRACED
MONOPLANE.

SCALE  1' 2' 3' 4' 5'

PAUL PLECAN "36"

From prop boss to rudder, our F.A. Fighter is one-hundred percent flyer—as this “shot” quickly proves. Note the novel tail-skid, realistic cowl, and neatly-sprung landing gear of this superb parasol job.



No speedier, zippier, or sassier flying model has ever come our way than this 20"-span jim dandy. It's from the workbench of Louis Garami—and as all of you fellows who've built Garami models know, that means the ship's an A-1 plus craft. Ye Editor, in fact, liked this skyster so much that he's hung the original F.A. Fighter right over his desk. And now he's worried to death for fear someone will steal it.

Build the F.A. Fighter

EVEN though it is not studded with machine guns, this trim little aircraft is a fighter in every sense of the word. Its good looks, excellent flying qualities, and several new features should work any modeler up to such a high pitch that it'll be hard to keep him from his balsa, cement, and razor blade.

The new all-balsa hexagon body incorporated in this top-notch ship has been tried out by a half a dozen different builders, and it has proved to be one of the simplest and strongest for its weight. Even beginners have had little difficulty in constructing it, so read the instructions carefully and let us start with the—

By Louis Garami

FUSELAGE

THE first step is to cut out the six sides of the body. A soft 1/16" sheet, 3" by 36", should be sufficient. As the sides are all the same, they should be pinned together and sandpapered to size. After this is done, mark the position of former D on both edges with a pencil. Place this former D on the line and cement all the sides on it securing each with pins. Check at the nose to see that everything is in line. The best way to make a sure check is to stand the side on end and see that it does not topple over.

The next step is to pull the nose together. First, pin the side pieces together, then fill the seams with cement. The same procedure is repeated on the rear of the body.

In about 20 minutes the pins can be taken out and the whole thing sandpapered smooth. Now cement former C up the front and start to work on the cowling. Get formers A and B fastened together with four 1/8" sq. balsa pieces of the required length. Now cover the outside with 1/32" sheet balsa. The front and rear can be trimmed after the glue has set. Proceed to cut ring K out of 1/8" balsa and cement to the cowl, sandpapering it to shape after it has dried.

The noseplug is made of a 1" by 5/8" balsa block. For the bearing we use large copper washers with small eyelets inserted in them. To complete the body, glue the finished cowl to the body and line it up from all directions.

Now the square opening can be cut for the rear

hook. On the opposite side a hole is drilled and a small eyelet inserted

outside. A large washer is cemented in place inside the body to receive the rear hook. The other opening required is the cockpit, which is cut with a sharp pointed razor blade. Next the headrest blank is made out of 1/32" balsa and the celluloid windshield is cemented in place.

Cut the landing gear struts out of 1/8" medium balsa. Sandpaper the edges and proceed to bend the piano wire for them. The side view shows how the wire fits the bottom apex of the body and then runs down on the inside of the struts forming the axles also. Thus we really have a wire landing gear with wooden struts cemented on in such a way that they can move freely to take up the shock from any direction. This means that the wooden struts are *not* glued to the body. The hardwood wheels used are 1 1/8" in diameter.

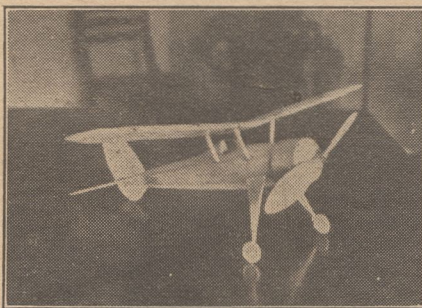
WING, PROP, TAIL

FOR the wing, first cut out the trailing edge and pin it down. Next cut all the ribs and cement them to their correct position. Now the leading edge is added and the whole thing is left to dry. In the meantime you can bend the wing tips. Do not try to bend two separate tips. Get a whole piece of bamboo (15" by 1/4" by 1/16") then bend it above the gas flame. Then let it cool off and you can slice four nice tips out of it with a sharp knife. The 1/16" by 1/8" spar runs to the last rib where it tapers away to meet the tip.

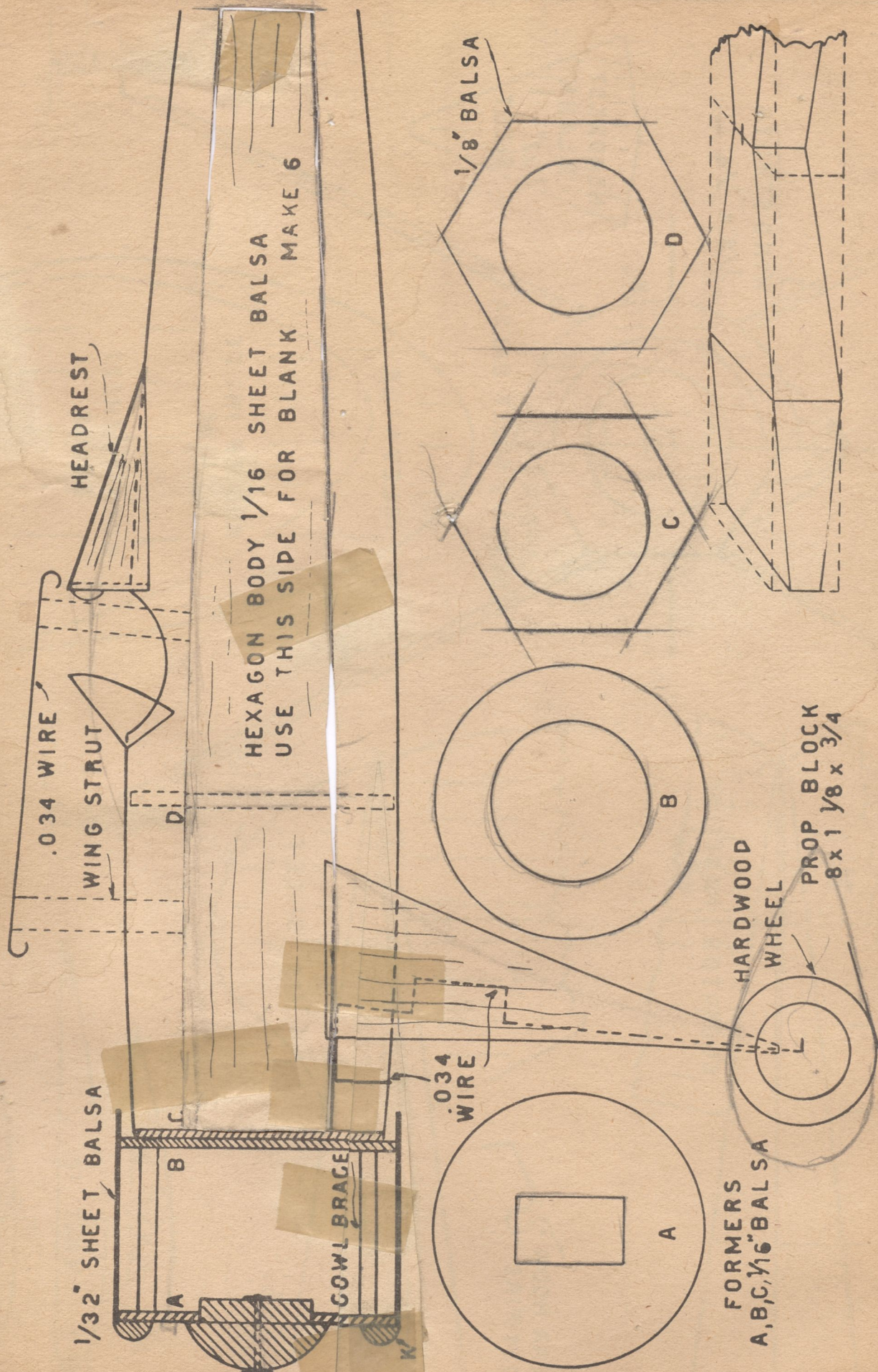
When the whole frame work is dry you can shape the leading and trailing edges and join the two halves together. The dihedral should be correct automatically, since the two center ribs are tilted.

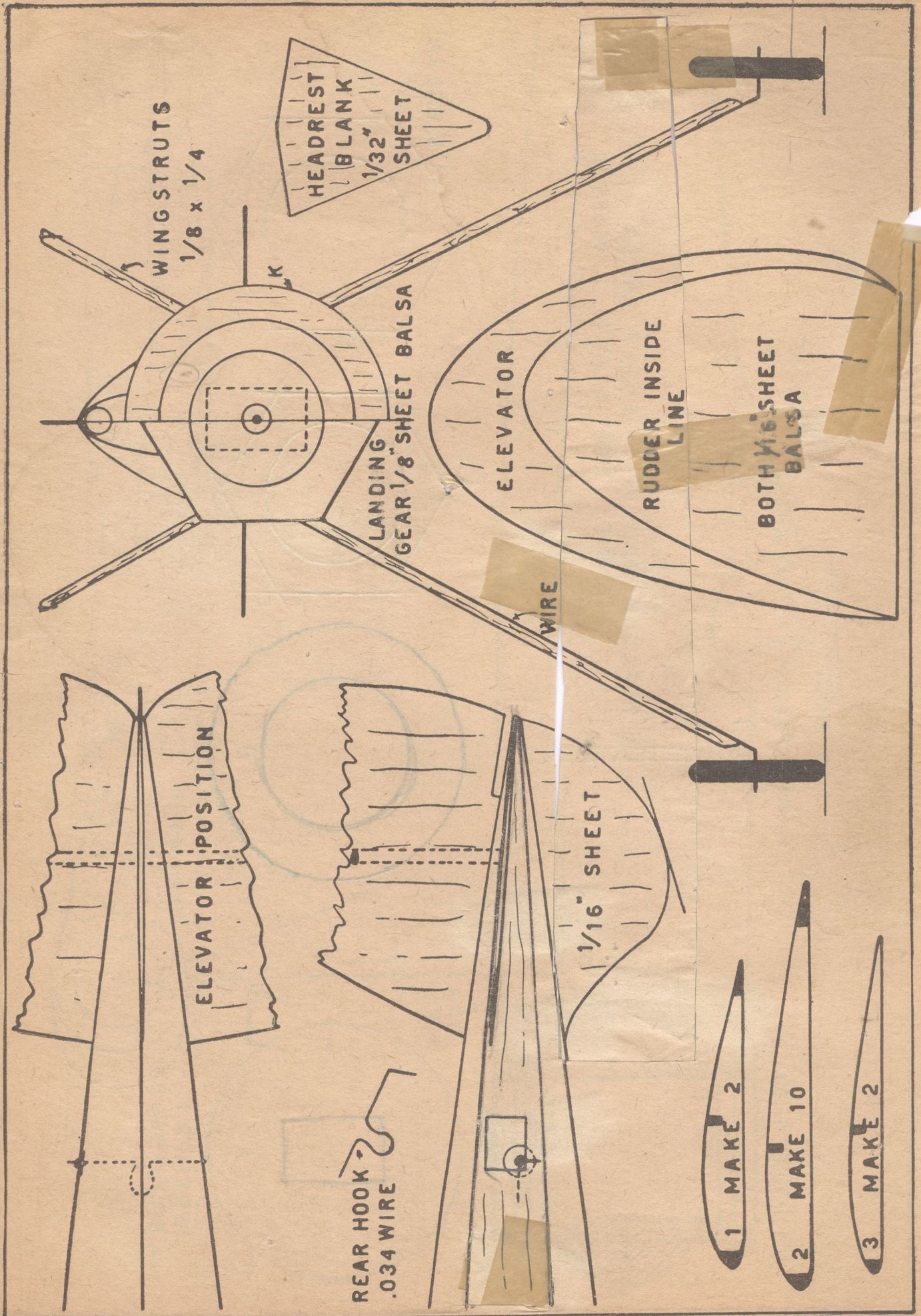
Covering is done the usual way, being sprayed with water and with one coat of banana oil brushed on to toughen it up. Soft 1/16" sheet balsa is used for the tail surfaces, which are sanded smooth and glued into their position on the body. There are two small struts going from the elevator to the rudder made out of 1/8" sq. balsa sandpapered streamlined. As you will notice, the rear part of the rudder is cut away a little and is not glued to the body. In this way it is easier to make adjust-

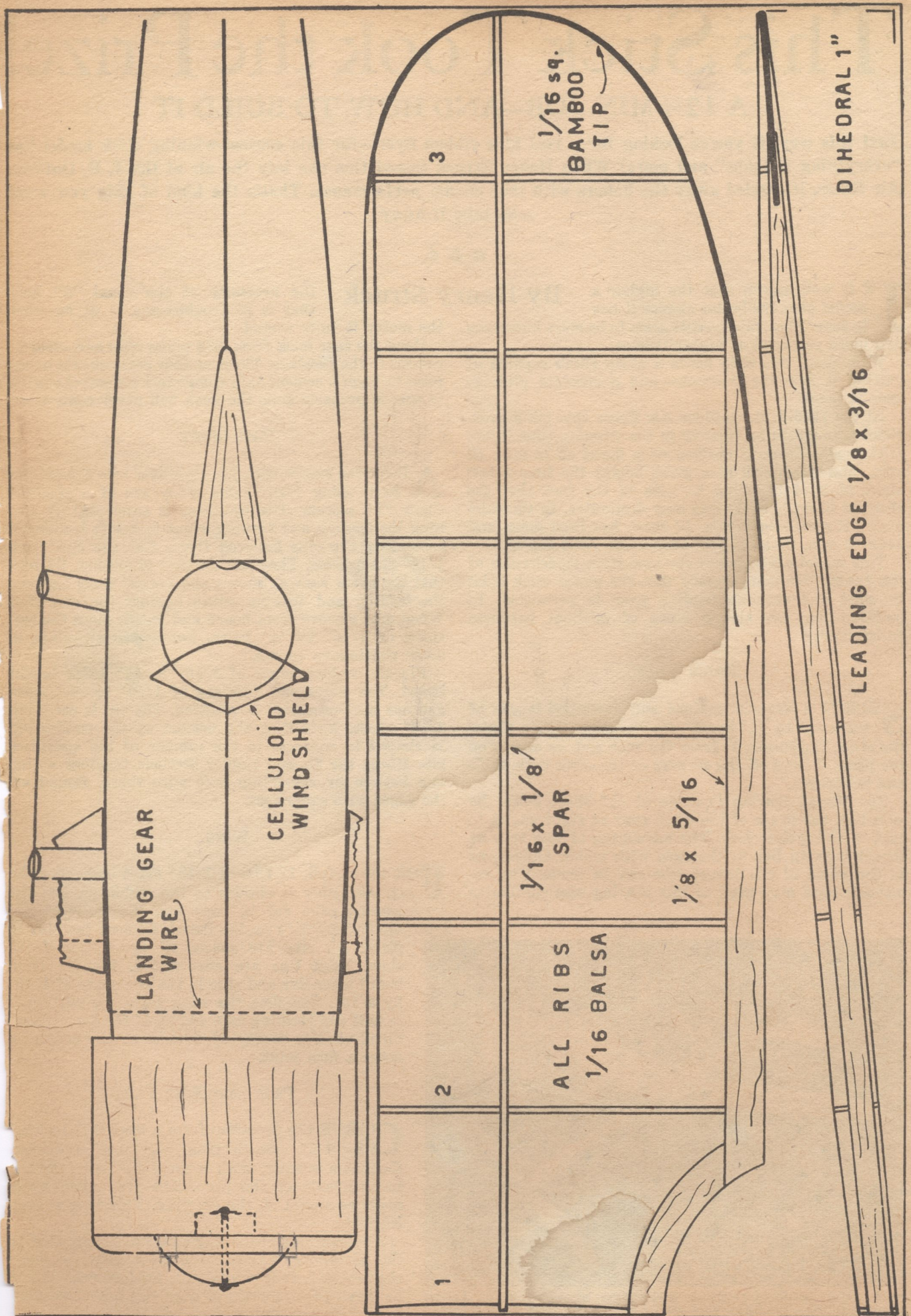
(Continued on page 82)



Here we get a good view of the wing-strut detail and nose assembly. It wouldn't take more than a couple of turns on that efficient little prop to lift the F.A. Fighter right off that table in an aerobatic zoom.







This Stick Took the Prize!

A 12½ MIN. JOB—AND HOW TO BUILD IT

Taxi this way, if you're looking for a real blue ribbon flyer—for this contest-winning stick model has "everything it takes" and more! When Henry Struck tossed this one into the air at the J. B. Outdoor Air Races, it carried away the honors with true champ performance. That's the kind of ship you want—so take it away!

IT is well known that the higher a model goes the better chance it has to soar. Thermal currents seem to be more numerous and more powerful at high altitudes.

Well, fans, this ship packs a steep climb capable of getting it into the thermals—and a splendid glide to keep it there!

At the 1936 J. B. Outdoor Air Races this job demonstrated its worth by turning in the winning time in the stick model event. It chalked up a flight of 12 min. 46 secs., and while still at a great height the timers lost sight of it. Interesting to note is the fact that the shortest flight it made was over 4 minutes. In the calm air of the evening 3 min. 10 secs., has been done, and about 2 min. 30 secs., has been made consistently.

This model conforms to the new stick model rules of the Junior Birdmen, namely that the motor stick must be solid and that no landing gear is permitted. In building her use strong balsa of medium hardness throughout.

MOTOR STICK

SELECT a straight grained and unwarped length of balsa ½" by ¾" by 30" for the motor stick. Taper the stick, beginning 8" from the rear end, as shown on the plans. Round off the corners of the stick with knife and sandpaper.

The thrust bearing is made of ⅛" sheet balsa. Be sure that the grain of the wood runs at right angles to that of the motor stick. The advantage of this type of thrust bearing lies in the ease with which alterations in the angle of the thrust line can be made. The removable nose plug used in this bearing also eliminates

By Henry Struck

the necessity of the usual "S" hook that is so troublesome to fit on when the motor is fully wound.

Bend the rear hook from .034 piano wire and securely cement to the fuselage. Three or four coats should be applied to form a cement skin completely around the stick. If this is properly done the hook will never come loose.

TAIL GROUP

AS for the empennage, the stabilizer ribs are cut out first, using 1/16" balsa. They are of a modified Clark "Y" section. The stabilizer is assembled by pinning the leading and trailing edges to a soft board, and cementing the ribs between them. Cut the tips from 1/16" sheet balsa. They are circular in outline. Be sure that the grain runs as shown and cement them between the leading and trailing edges against the end ribs. When dry, remove from board and put in place the two spars of 1/16" by ⅛" balsa. Sandpaper all edges to make continuous curves.

Pin the rudder edges of 1/16" by ¼" balsa to the board. The spars and ribs are of 1/16" by ⅛" balsa and are next cemented in position. The tip is cut from 1/16" sheet. Note that the bottom of the rudder rib is shaped to conform to the camber of the stabilizer rib. Hinge the fin and rudder sections together at top and bottom by cementing soft wire there. Round off the edges with sandpaper.

WING

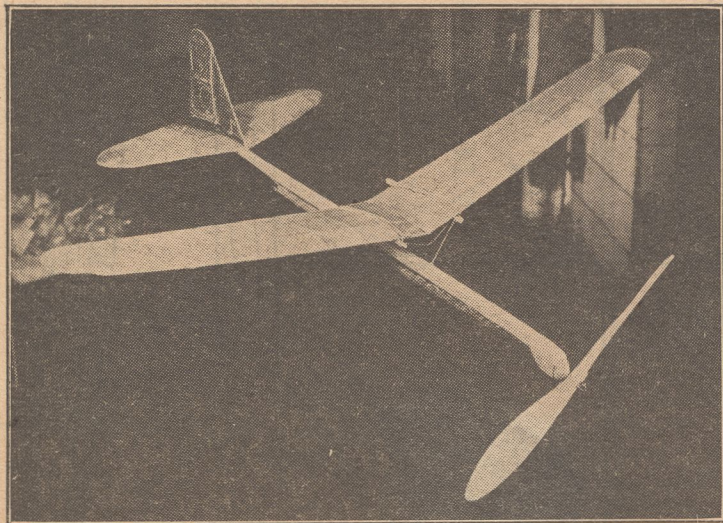
FOR the airfoil, 18 ribs of 1/16" sheet balsa must be cut. Assembly is similar to the stabilizer. Pin the leading edge (of ⅛" sq.) and the trailing edge (of ⅛" by ⅜") to the board. Cement the ribs in place. All ribs are spaced 2" apart. The 1/16" sheet balsa tips are next added. Remove from board when dry and glue in the two spars of 1/16" by 3/16". Complete the wing frame by cutting it in half and blocking each end up 4" for the required dihedral. Use plenty of cement at the center to make a firm joint.

PROP AND NOSE PLUG

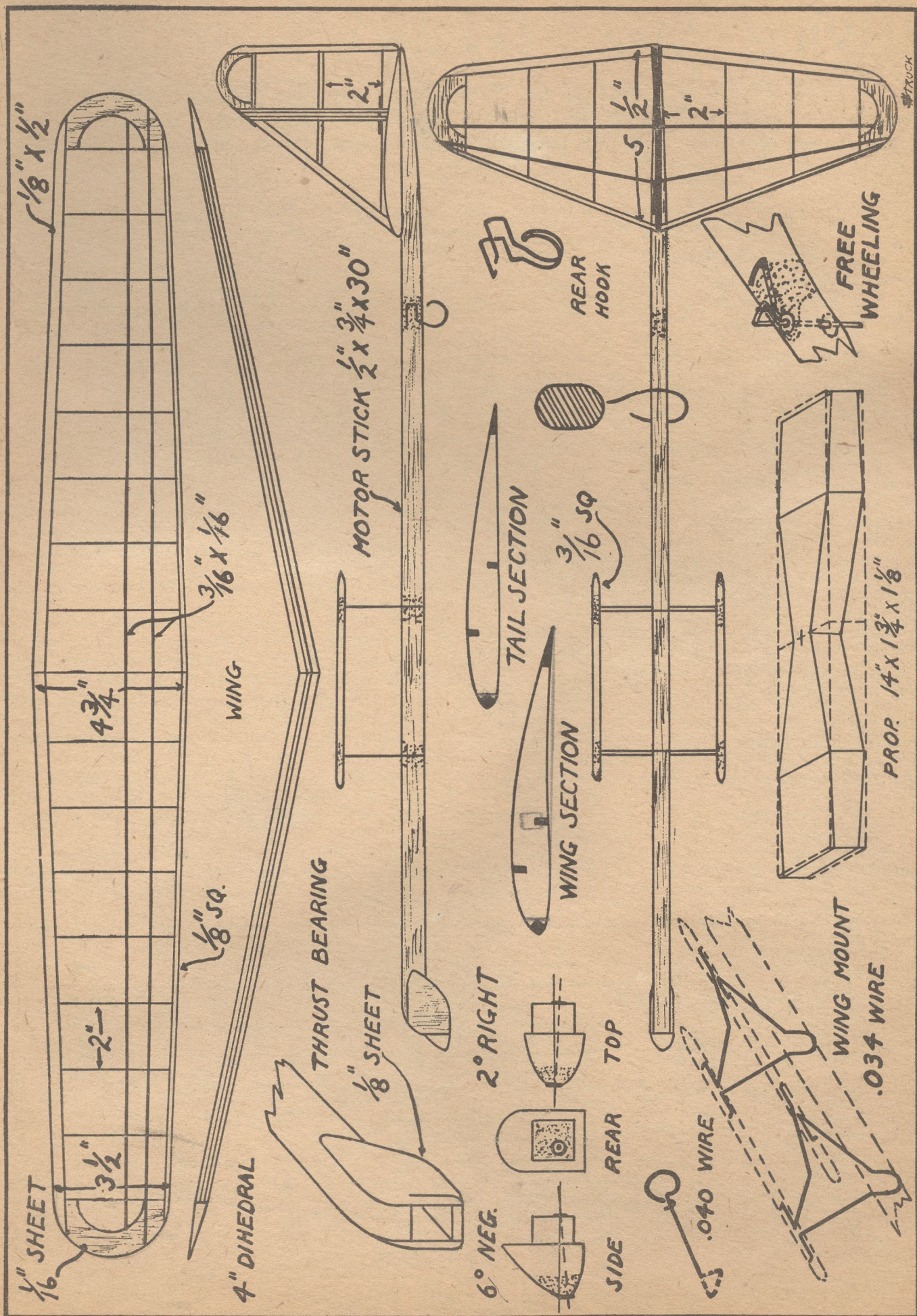
CARVE the propeller from a block 14" by 1¾" by 1½" smooth with very fine sandpaper. Cement a washer, with a small bushing inserted, to each side of the prop. The free wheeling is made as shown on the drawing. This type is very efficient.

At least four coats of glue should be applied to the aluminum tubing to hold it securely when the rubber is fully wound. The finished prop should be given several coats of dope—or one of cement

(Continued on page 91)



Sleek, rakish, powerful! That's the Struck Stick all over! Note its graceful parasol-type wing, its efficient prop, and its solid, durable motor stick. Following contest rules, the craft carries no landing gear.



Flying Aces Model Laboratory

THE HOWS AND WHYS OF AIRCRAFT PONTOONS

Step, dead rise, chine line, metacenter—do you know what these mean in aircraft pontoon design? If you're planning on building a flying model seaplane, you should know. So here we go to tell you all about it—

By Avrum Zier

Model Department Editor

QUITE frequently model builders are reluctant in building a replica model of a seaplane because of the difficulties encountered in the construction of the pontoons. Those of us who have built model seaplanes have found that construction of these pontoons often involves as much painstaking work as the fuselage; and into the bargain the added weight and extra bulk greatly decrease the performance of the flying model.

In a *replica* flying model the builder is greatly concerned with lightness of the floats. Yet to attempt to reduce their size, thereby reducing the resistance, only detracts from the authenticity of the ship. But in the case of other models, such as the contest R.O.W.s (rise off water), the matter of size is entirely at the discretion of the builder. On such types the pontoons necessary to support the model are of such small size that they are actually no heavier than wheels and offer very little added drag.

In this article we are going to discuss the designing of model pontoons and model flying boat hulls from both a technical and a practical standpoint.

In considering the technical qualities of hull and pontoons we shall refer to both as being a hull; for each is designed along the same lines—*i.e.*, for the purpose of landing on, and getting off, water. Their true difference lies in their practical application. A hull serves both as a fuselage and a landing gear while pontoons serve merely as the latter.

Most of us are familiar with the general appearance of a flying boat hull, but few persons, it seems, are acquainted with the names of the different parts which comprise this structure. In Figure 1 is shown a three view layout of a conventional hull with the various

parts named. It wouldn't be a bad idea if you studied this terminology, for we shall use it frequently throughout our discussion.

If you have ever watched a seaplane or flying boat take off, you may have observed that it requires considerable distance before it actually leaves the water—"breaks surface," as they say. This long run is made necessary by the natural tendency of the water to hold the hull to its surface. Technically, this condition is called *surface tension*.

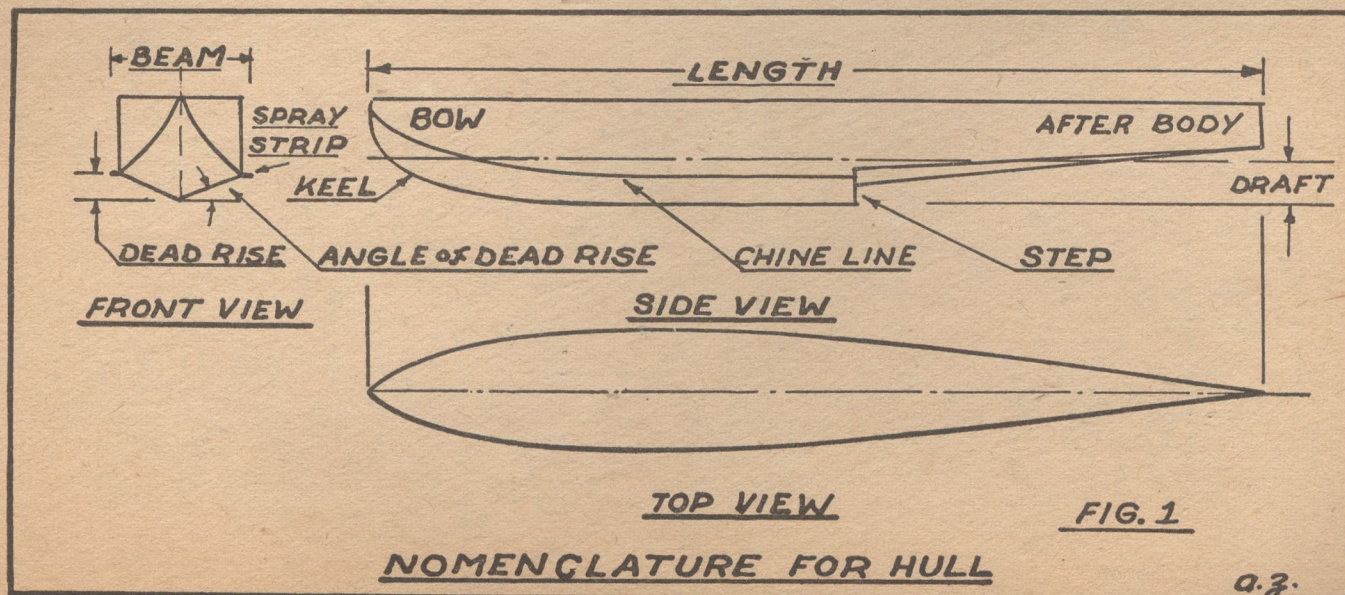
JUST how strong this tension is can be illustrated in any pan of water by placing a block of wood on its surface. You will notice that if you slowly lift the wood away, the water has a tendency to stick to the block and prevent you from breaking its surface. This condition is most predominant in the case of a smooth body of water. Under such conditions heavy airplanes have been known to spend considerable time in futile attempts to take off. When General Balbo visited this country with his air armada of 24 seaplanes he experienced this difficulty.

In the case of rough water the take off is easier, for the disturbed water allows the ship literally to bounce into the air. You see, the surface has already been agitated, facilitating breaking of the tension.

And so in hull design it was found that by incorporating a *step*, or a break in the bottom of the hull, a turbulent region on the water could be created to aid the ship in breaking surface.

Because the take off is the major concern, the engineer first calculates the step design. Without the step the ship might be only a beautiful motor boat with wings on it.

Hulls have definite aerodynamic characteristics just as do airfoils. These are determined by racing a model of the proposed hull through a towing tank and record-



ing the results. The model is tested under two conditions—the *fixed trim condition* and the *free to trim condition*. Fixed trim is where the model hull is fixed at a definite angle to the water line; free to trim is where the hull is merely held in place by a pivot and is free to assume any angle it desires. In the free to trim form it is quite obvious that the hull would assume an angle of least resistance. The hull is also tested for reaction at various submerged depths, for it is also obvious that the greater the volume displaced the greater will be the resistance of the hull (see Fig. 2).

After the tests are completed on the hull it is then possible to calculate whether or not the hull will break surface under the power available. If it is found that it will not, it means that the engineer must start all over again and try another hull.

When a water craft is taking off—especially one of the hull type—it is apt to list from one side to another. One way of returning the ship to normal condition would be by manipulation of the ailerons; however, the air forces acting on the ailerons, or for that matter on any other controlling surface, take effect only after a certain velocity is obtained. For this reason, it's necessary that the hull used is in itself a stable body. Stability of a hull depends upon two forces: The weight of the hull acting down through the center of gravity, and the water force on the bottom of the hull acting up through the center of buoyancy. A third factor which becomes important as far as locating the center of buoyancy at any angle of list is the *metacenter*. The metacenter is a theoretical point located on the center line in the same straight line as the center of buoyancy and center of gravity, Figure 3. Just how the metacenter is used will be illustrated shortly.

When a hull is in the normal upright position the center of gravity and center of buoyancy both lie in the same straight line. If, now, the hull should tilt to one side, as indicated in Figure 3, the weight no longer will act along the center line but at an angle to it. Since the position of the hull has changed, it is obvious that the portion now under water has likewise changed and that the center of buoyancy has moved to a different position. Observing now the location of our two forces it can be readily seen that if the weight is acting downward and the center of buoyancy upward, a *couple*, or twisting force, is set up in the opposite direction to the tilt which will tend to bring the hull back to normal position. Now the metacenter is the point made by the intersection of a line passing normally through the center of buoyancy and the center line of the hull. At

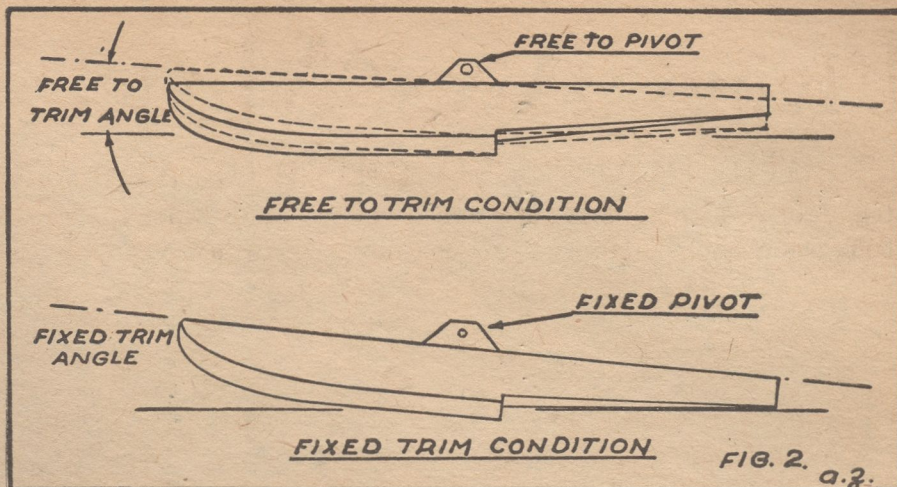


FIG. 2. a.g.

any angle of list the position of the center of buoyancy can be found by merely dropping a perpendicular through the metacenter.

The deciding factor whether or not our boat will be stable depends upon the location of the metacenter. If the metacenter is found to lie above the center of gravity, then obviously the center of buoyancy will always move to the side of the list, and coupled with the center of gravity a restoring force will be set up.

On the other hand, if the metacenter is found to be located below the center of gravity it can be seen that the restoring couple now set up will only aid in turning the hull over, rendering it unstable. The most stable condition that any hull can possibly have is when the center of gravity is below the center of buoyancy; however, this condition can never be hoped for in a seaplane or flying boat design as the distribution of weights always gives a high center of gravity.

ANOTHER factor which not only affects the stability qualities of the hull but also its take off, is the *angle of dead rise*. This angle, noted in Figure 1, is made by the bottom of the hull and the horizontal, as indicated. If this angle is large, our hull will be a steady rider. But because a greater angle here means deeper submerging than if the angle were less, the area of water tension would be greater, necessitating an increased run for a take off. On the other hand, a smaller angle may give a rougher ride, and thus the chances of breaking surface sooner will be better. About the best angle to use is a 20 degree dead rise.

Thus far, we have been considering the technical side of hull design without making any mention of actual means of model construction. But in our next article we'll give you the full "dope" on making these structures for your models. The various methods of construction which this department has found best will be fully explained and illustrated. So watch for our next issue, all you seagoing model flyers.

One of the methods which will be described calls for the employment of a special built-in jig which becomes part of the structure after the pontoon is completed. Another practical method which we will explain in full detail also calls for use of a jig, but in this case retention of the device in the finished pontoon is optional with the builder.

You will find that these construction systems will save you much time and labor. So be sure to be on hand here next month, fellows.

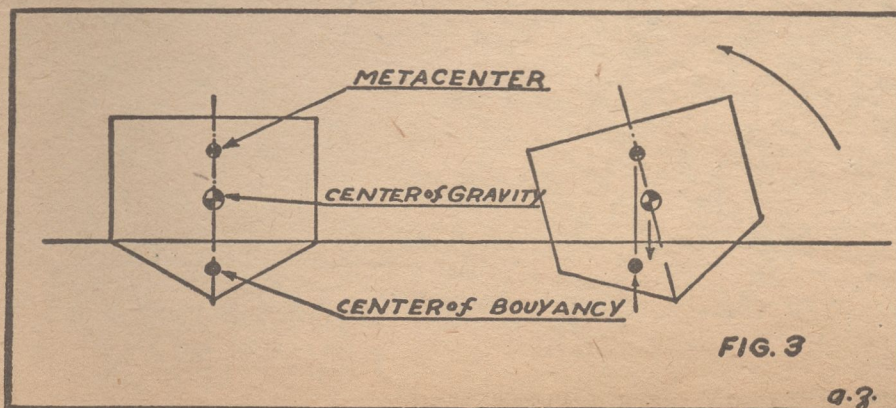
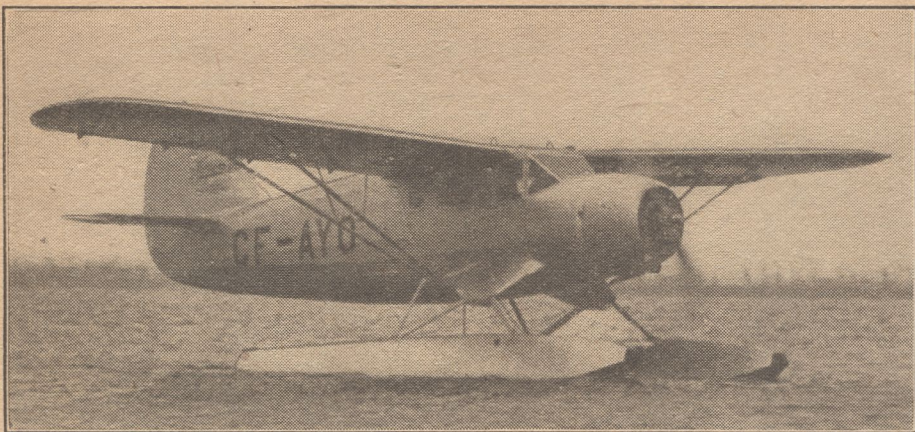


FIG. 3

a.g.

As a high latitude flyer the new Noorduyn fills the bill with plenty to spare. Here she is on floats, revving over sweetly and hankering for a journey into the wilds. Incidentally you'll find this photo handy for checking purposes when building your model. (A.S.N. Photo, Montreal)



"A darned good plane that'll stand the gaff!" That's what they had to have in the wilds of North Canada — and the Noorduyn Company saw that they got it. Their "Norseman" furnished the quick takeoff, low landing speed, steep climb, and good pay load that was needed. And here's the story behind it plus full instructions for turning out a darb of a solid scale model.

Construct the "Norseman"

By Jesse Davidson

FIRST off, before going into a detailed description of the "Norseman," we'll tell you about the stringent conditions which inspired the enterprising Noorduyn group to manufacture this striking plane—conditions demanding the utmost in airplane performance and efficiency.

In Northern Canada, the topography is rugged, the natural resources virgin, and the climate is often frigid. To exploit the wealth of such a region, the airplane has proved a godsend. But the men who turned to the sky quickly learned that their airplanes "had to be darned good to stand the gaff."

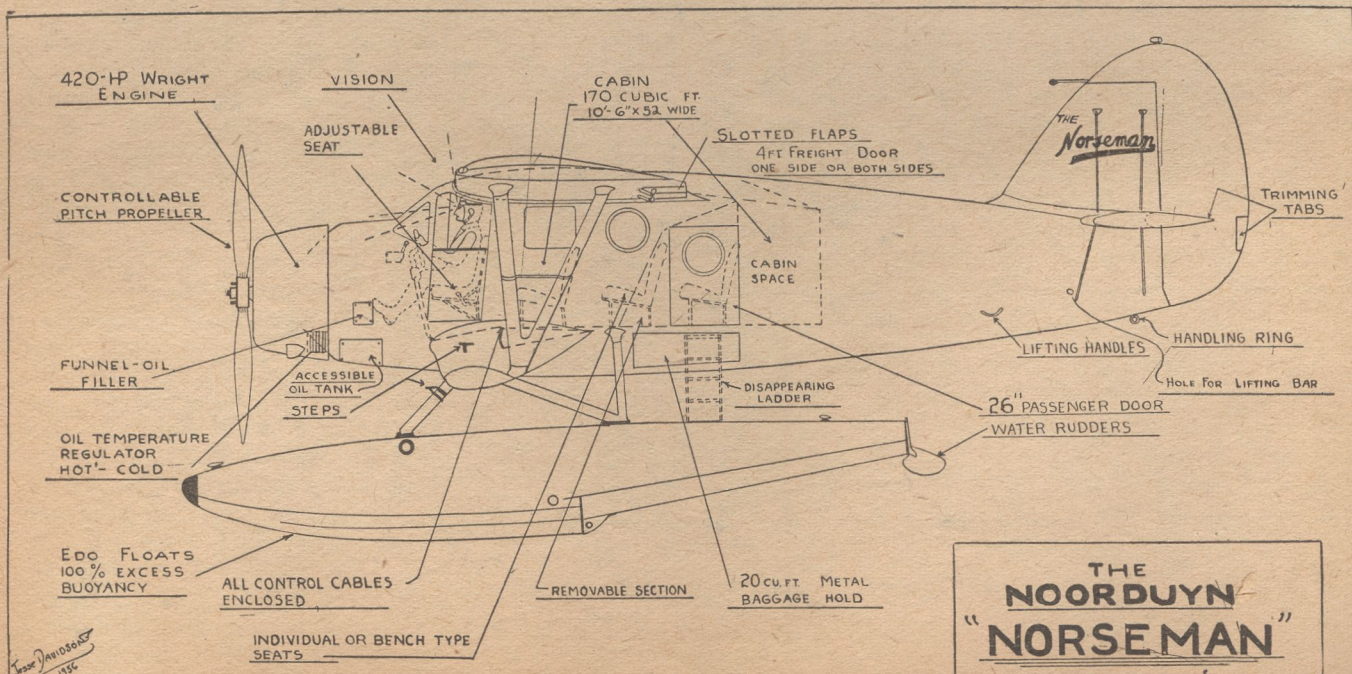
Flying in the North is at all times a more or less bumpy proposition and it is difficult to judge weather conditions at any distance from an operations base. Some of the territory is practically inaccessible on foot; and the rivers and lakes in many cases are small, while the mountain ranges are from 9,000 to 12,000 feet in height. Because Canada has so many lakes, airline op-

erators equip most of their planes with floats in order to have access to the many natural water "landing fields."

An airplane with a good payload, quick takeoff, steep angle of climb, and low landing speed was sought by several operators. The Noorduyn group undertook the job, and after collaboration with many of the pilots, whose suggestions proved invaluable, the "Norseman" was evolved to meet those requirements.

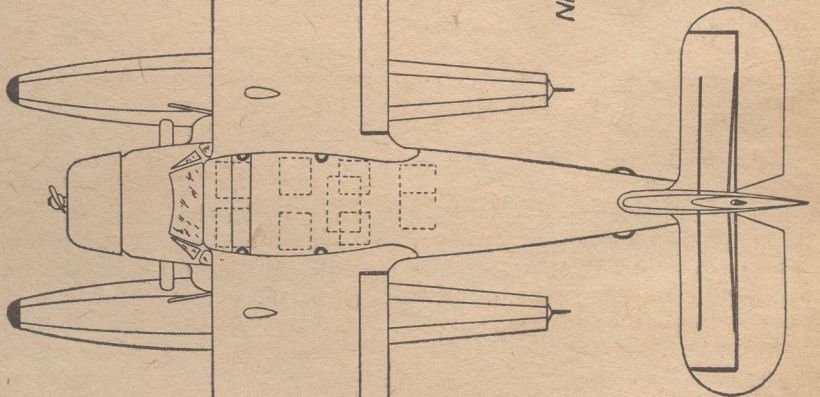
Not only did this ship fulfill every expectation of the designers, but it far exceeded them. Here was a rugged airplane for use in a rugged territory. Appropriately it was named the "Norseman."

Transportation of freight by air is common in Canada, especially to the mining districts. The planes accept anything for transportation—provided the cabin door can be shut. To stand on the dock at any one of the seaplane bases and view the piles of machinery and merchandise accumulated for transport by air impresses

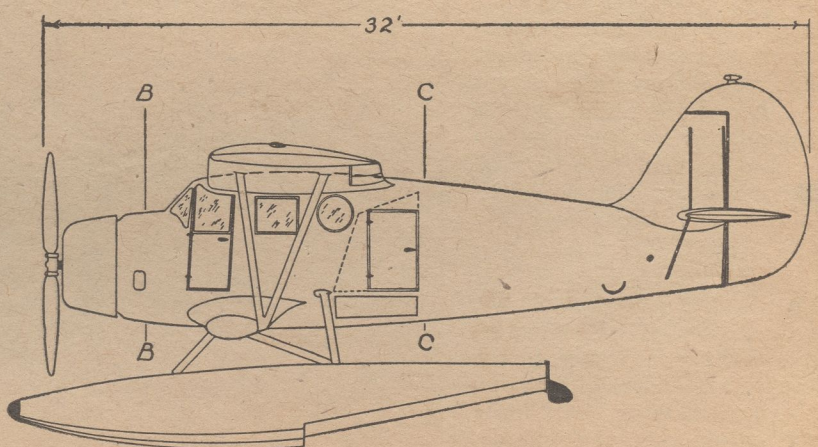


PLANS FOR THE "NORSEMAN"

PERFORMANCE - SEAPLANE
 HIGH SPEED - 146 M.P.H.
 CRUISING SPEED - 125 M.P.H.
 LANDING SPEED - 53 M.P.H.
 CLIMB - 820 FT PER MIN
 SERVICE CEILING - 15,200 FT



A



51' 6"

32'

POWER PLANT
 CANADIAN WRIGHT R-975-E3
 420 H.P. AT 2,150 R.P.M. AT SEA LEVEL
 450 H.P. FOR TAKE OFF

TAKE OFF WITH FULL LOAD
 21 SECONDS

THE
 NOORDUYN
 NORSEMAN
 SCALE $\frac{1}{8}$ " = 1'

Designed by
Noorduyn



This time, we see the "Norseman" fitted out with skis for work during the long northern winter. Note that the "snow staves" are fitted onto the same undercarriage stubs that take the wheels in the land plane version shown at the bottom of this page. (Royal Canadian Air Force Photo)

one with the fantastic thought that soon these objects will be hurtling through the air at better than one hundred miles an hour. Yes, the men of the north have "gone for" aviation in a big way. Indeed, it is not unusual for a plane to fly a party of gold prospectors or trappers outfitted with a six months' supply of food far into the interior, with arrangements made to pick them up at the termination of that period.

COUNTLESS times, too, airplanes operating in the North country are pressed into ambulance service. A glance over the pilot's log book wherein ambulance notes are listed will give you a good idea of the many mercy errands of these ships—

"Picked up man who chopped foot open with axe."

"Sick woman. Very serious. Stretcher case."

"Lunatic Indians with a Constable."

"Manager of Northern Traders, seriously ill and doubtful if will live until such time it takes to go to Edmonton. Flying under two thousand feet due to weakness of heart condition. Rain and fog."

"Emergency trip to Red Lake for acute appendicitis case. On arrival found patient had died after operation previous night. Brought out body also his wife and child. Could not land at Gold Pines on account of ice. All lakes and rivers between Gold Pines and Red Lake frozen over. Heavy sleet and snow. To Red Lake and return 232 miles."

"Man with arm badly injured by accidental discharge of shotgun. Arm had to be amputated."

In one case a pilot landed his plane on a pin-head size island to remove an ill lighthouse keeper who needed hospitalization immediately. On another occasion a pilot had to go to the assistance of another lighthouse keeper farther north, and after several unsuccessful attempts to put his ship down in a small body of water he landed it in a rough sea which was lashing the coastline, took his man aboard, got the ship off the water by some superhuman piloting, and delivered the man to a hospital where an operation was performed and the man's life was saved.

AND now reverting to the details of the "Norseman": With reference to the feature of convertibility from wheels to skis or floats, it is emphasized that the "Norseman" is not a land plane equipped with floats as an afterthought, but rather a

plane in which all these forms were studied as a part of the original design. On floats the balance and relative angles are so perfect that a takeoff is made easily with full load without touching the controls. The "Norseman" is suitably used as a freight carrier, ambulance transport, troop transport, and general passenger ship. It can also be fitted as a comfortable private owner's plane.

The Noorduyn job is a high wing cabin monoplane, convertible for floats, skis, or wheels; freighter or ten place. It is powered with a 420 h. p. Canadian Wright R-975-E3 engine hitting 2,150 r. p. m. at sea level and rated at 450 h. p. at takeoff. An Eclipse Direct Electric starter is provided, also an emergency hand-crank. The propeller is a Hamilton-Standard controllable pitch. The floats are the well known Edo type equipped with water rudders.

The wing span measures 51 ft. 6 ins. and the fuselage 32 ft. Wing area is 325 sq. ft.; fuselage width 5 ft.; fuel consumption at cruising speed, 19.5 gallons per hour; and oil, 6 gallons per hour. As a seaplane with a full tank it has a cruising range of 670 miles, as a landplane 750, and as a ski-plane 710. By use of all or part of the lower baggage compartment for extra tankage, a range up to 2000 miles can be obtained. The fuel is gravity fed from two aluminum wing tanks. All pipe lines and fitting are accessible. Gasoline capacity is 125 gallons.

The pilots seat is adjustable both in flight and on the ground. The cabin seats are the bench type for eight persons, instantly removable without tools and folding back. Life preserver cushions are provided.

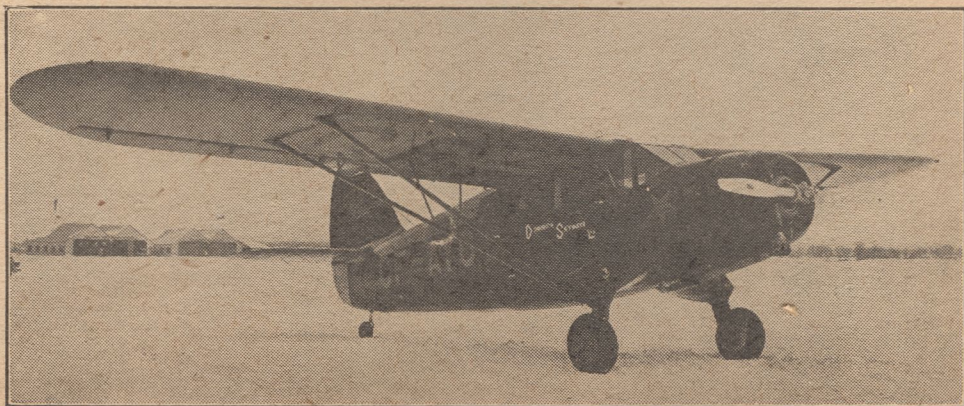
Speeds are as follows: Land plane—high speed 160, cruising 140; seaplane—high speed 146, cruising 125; and ski-plane—high speed 148, cruising 132.

And now here are instructions for making a solid scale model of this high-latitude ship—

HOW TO BUILD THE "NORSEMAN"

THE three-view drawing accompanying the article serves to give you the general outlines for your model. The smaller drawing on the first page shows the side view and the interior arrangements. It will be helpful to those who go into detail when building a cabin job.

Off hand, the "Norseman" strikes one as bearing a
(Continued on page 94)



Yes, the "Norseman" is a true triple-threat job—for with its varied undercarriage equipment, it's ready for either land, snow, or water. In the rugged regions of Canada, however, you don't often see the ship wheel-gearred as above; for skis and floats are what the flyers want when they head for the top of the world. (A.N.S. Photo, Montreal)

News of the Model Meets

METROPOLITAN LEAGUE GAS MODEL CONTEST

GAS MODEL AERONUT CLUB TOURNEY

UNDER the sponsorship of the Metropolitan Model League the first limited gas model meet was held at Hadley Airport, New Brunswick, N. J., on October 24. The requirement of the meet was that no model shall remain under power longer than 45 seconds. The contest was quite a success as no models were lost, as was the ease in many of the previous contests where no flight limit was set.

Many model builders preferred to use just the proper amount of fuel to last 45 seconds. Others employed similar devices to those described in the November issue of *FLYING ACES*.

The best time made was 2 minutes 34.4 seconds, by Ted Keiser, of Jackson Heights, Long Island, N. Y. Second place was won by Earl Doughty, of Brooklyn, N. Y. His time was 2 minutes and 23 seconds. Walter Dickinson, of Newark, won third place with a sustained flight of 2 minutes and 10

seconds. Fourth place was taken by Henry Bovin of Brooklyn, N. Y., his time being one minute and 50 seconds. Fifth and sixth place, respectively, were awarded to Alan Turner and Raymond Heit.

Credit is due to Mr. Roberts, manager of Hadley Field, for his kind cooperation in making possible the meet.

GAS MODEL AERONUT CLUB TOURNEY

ANOTHER interesting model meet was the Gasoline Powered Model Airplane Contest sponsored by the Gas Model Aeronut Club of Gage Park, near Chicago. The meet was held at the Curtiss-Reynolds Airport, Glenview, Ill., on October 11. Fully 1500 spectators turned out to see the 40 contestants compete for the prizes. Among those present were, Dr. C. F. Burgess, President of the Burgess Battery Company, who gave a free battery to each contestant; Walter Addems, chief test pilot of United Airlines, who entered his own gas model with a home made engine; and Vernon Boehle, 1935 International Moffett Trophy winner, who competed for Indianapolis. Five of the contestants were from Toledo, five from Indianapolis, six from Joliet, Ill., and the remainder from Chicago.

Bernard Johnson, of the Gas Model

Aeronut Club, won first place in the tourney with a sustained flight of 46 minutes and 4 seconds. This effort unofficially surpassed the World's open class record. His award was the Chicago Park District Championship Trophy. This trophy is given yearly for the best duration flight made by a Chicago District contestant. Along with that Johnson also received the B. J. Kestl Trophy and a G.H.Q. gas engine offered through the courtesy of Dr. C. F. Burgess.

Second place was won by Miles I. Stone, of the same club. His time was 12 minutes and 56.5 seconds. He was awarded the Aeronut Club Gold Trophy and a Megow Gas Model Kit with a set of M & M air wheels.

Bud Johnson was awarded third place with a flight of 8 minutes and 23.8 seconds. He was awarded the Pattiss Silver Trophy and a one year subscription to an aeronautical magazine. Melvin Yates, Charles Thornton, Hubert Bodinet, I. C. Goebel, R. L. Webber, Joe Konefes, George Huguelet, and Milton Huguelet took the remainder of the eleven places in the order named. All placers represented the Gas Model Aeronut Club with the exception of Charles Thornton, who is a member of the Central Gas Modelplane Society of Chicago.

From the Model Builder's Workbench

HINTS ON MODEL REBUILDING

NEARLY every model builder has some plane which is too old or too badly cracked-up to fly, yet seems too good to throw away. By careful rebuilding, such a plane may be restored to flying condition, as good as new.

One of the first parts of a plane to show the wear and tear of many flights is the covering. First, remove this covering. Now you can readily see what else remains to be done. Measure and record the dimensions of all struts, and if necessary make a note of the exact spot where they must be replaced. Now cut them loose, removing the wings, landing gear, and tail assembly. Next remove the old dope and paper cement with a bit of cotton moistened with acetone, or with a small piece of very fine sandpaper.

All the formers, bulkheads, and ribs in wings and tail surfaces must be checked to make sure that they are not broken or out of line. To repair a broken bulkhead, remove all splinters and put in a new piece and glue it, with overlap at each end of about an eighth of an inch. When the cement has dried, sand to the proper outline. Make a careful inspection of the upright and diagonal pieces in the fuselage; and if they are cracked, put in new pieces. Be sure the glue seals are not broken. If they are, reglue.

Prepare properly braced seats for

each strut. If the model has shown a tendency to wipe off the landing gear, extend the braces to both the upper and lower longerons. Now see that the wings and tail surfaces are not warped. If they are, steam over a tea kettle spout until pliable, then pin flat on a drawing board until dry and cool. They should then remain in line when removed from the board.

You are now ready to re-cover the model. This follows the usual practice, except that less banana oil may be used because the old wood is less porous than new wood. Oval fuselages should be cov-

ered with long strips of paper. Square or triangular fuselages should be covered with big rectangular pieces. Shrink the paper on the fuselage with water and allow to dry. Now attach the landing gear and wings and finally, the empennage. Brace each with the proper struts and thread "wires" and shrink the remaining covering. When whole ship is dry, go over all places where two pieces of paper join and apply another coat of paper cement.

If your model is to be doped, give the entire ship, including struts, a coat of banana oil. Follow with several very thin coats of dope. If dope is too thick, it will dry in uneven lines, making a mottled appearance. On modern planes, struts are usually finished in the trim color. On war-time planes, they are left natural.

The propeller of a plane takes a good many bumps and it is best to make a new one. See if the bearings are worn, and if too old, put on new ones. Needless to say, use new rubber, preferably brown rubber.

It is likely that you will have to make minor changes in balance, so that is the next step. If your plane is inclined to dive after a flight, bevel the nose-block so that the propeller pulls down about two degrees. This helps eliminate stalls.

Well blow me down, there she is, just like new, and to think you nearly heaved that sweet ship into the ash can!

—THOMAS MCGARRY

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.

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Hell Flies High

(Continued from page 8)

breathlessly. "General Brett wants to see you at Headquarters, sir, as fast as possible."

"Just a minute," returned Knight. "I'll have to look at this wing."

He inspected the bullet-holes, went to the small baggage compartment and unfastened the door. The driver, a timid-looking man with large tortoiseshell glasses, fidgeted uneasily.

"The General was in a terrible hurry, sir," he said.

"Does he want Mr. Doyle, too?" asked Knight, as he took his overcoat and hat from the compartment.

"Uh—yes, sir, I thought you understood that."

Knight carelessly lighted a cigarette, beckoned to Doyle, who had switched off the engine and climbed out. The driver missed the glance which passed between them. An officer and several mechanics were hurrying toward the Northrop from the Operations Office. Knight did not wait for them.

"It's Major Fuller—he'll understand," he said to Doyle.

The driver opened the rear door. Doyle climbed in, and Knight was about to follow when a phaeton with its top down skidded around the corner of the nearest hangar and swung toward the Northrop. At the wheel was General Brett, and beside him was Benita.

The driver, his timid face suddenly transformed, leaped back, clawing inside his coat for a gun. Knight's left hand shot out, twisting the man's arm. The impostor gave a howl of pain and went to his knees. With a snarl, he jerked out a small blue-snouted pistol. Knight's shoe cracked against his hand as the gun blazed, and the shot went into the ground.

Doyle plunged headlong out of the Army car. Before the assassin could snatch up his fallen pistol, the stocky ex-Marine was on him. Two thudding smacks from his fists, and the man collapsed limply.

"Good work, Larry," said Knight. "See what you can find on him."

He turned as Benita and the general ran toward him from the phaeton. Benita's dark eyes were wide with alarm.

"Ricardo!" she cried. "Are you hurt?" He smiled down into her upturned face.

"No, I'm all right, *querida*." Their eyes held for a moment longer, then he looked quickly at Brett. "This man evidently waylaid one of your drivers and took his uniform, as well as the car. He gave himself away, but we were going along with him to see what he was up to."

The gray-haired Intelligence Chief took a hasty glance at the Army tag number.

"Yes, it's Sergeant Johnson's machine. I sent him to pick you up—then I decided to meet you myself, to save time getting the details. Benita happened along at the Department just when I was leaving."

He wheeled as Major Fuller, the lanky C.O. of Bolling Field, reached the

scene with four men at his heels.

"What's happened now?" Fuller said, panting. "Oh—I didn't recognize you, General Brett."

There was a worried expression on Brett's kindly face.

"Send your men back out of earshot," he said in an undertone.

Fuller obeyed, and the mechanics drew to one side, staring at the captive. Doyle had searched the half-conscious man, and he now got to his feet with an assortment of objects.

"Gun, keys, watch, handkerchief and wallet," he enumerated the items. "No name in the wallet. Gun's a Colt .32 Special, and the watch is Swiss."

Knight examined the wallet, ripped open the lining. There was a card inside, with an odd seal and several numbers stamped on it. He looked from the figures to the key-ring. There were five keys. He scrutinized the middle one, looked at Brett and nodded.

"A-46031—the number's the same as the one on the identification card."

Major Fuller gazed down, puzzled, at the bruised face of the prisoner.

"I don't understand. Who is he?"

Knight's usual expression of whimsical indolence had vanished, and his dark-blue eyes were hard.

"He's an agent of the OGPU, the Russian Secret Police," he answered tersely.

The major started.

"Then we'd better get him locked up!"

"He probably won't talk," interposed General Brett, "but take him away and see what you can do. Call me at Headquarters if you learn anything—and notify the F.B.I. that Sergeant Johnson has been kidnapped but to keep it out of the papers."

Fuller saluted. "Yes, sir. But what about the Douglas? The A-17 pilot just radioed that he followed orders but can't find the ship."

"It crashed," Brett told him. "Send the pilot word to land here."

The major looked curious, but asked nothing further. At his command, the mechanics picked up the captive and hustled him off. The man had recovered his senses, and as he was taken away he gave Knight a murderous glare. Benita shivered.

"Mus' it always be like thees, Ricardo—that some one try to kill you?"

General Brett spoke before Knight could reply.

"We can't think of that now, my child. We must get back to Headquarters."

He led the way to the War Department machine.

"We can talk better in a closed car. Doyle, will you take the wheel? Benita, I'll have one of Fuller's men bring your phaeton up later."

Knight hesitated a second, looking at Benita. She made a charming little pout.

"I know—it is that you have big, important things you not want me to hear, no?"

"Not that," said Knight. "They may

be watching for this machine. But at that, you'll be safer than in an open car."

Doyle took out his automatic, laid it beside him on the seat.

"We'd better keep our eyes peeled," he grunted.

CHAPTER III

THE GREEN CLOUD

AS Doyle sent the car rolling past the hangars, Brett turned a haggard face toward Knight.

"Now, tell me what happened."

Knight complied. Brett shook his head dazedly.

"It's a worse muddle than ever. If we only had the key to it—but I'd better start at the beginning. As you know, we keep an eye on certain embassies here. Two nights ago, we noticed a sudden activity at the Soviet Embassy. Cables in a new cipher began to fly between here and Moscow. At the same time our code men in Communications caught some peculiar messages from Rome to the Italian Embassy. Half an hour later, Germany chimed in, and within two hours France and England were flashing messages to their embassies by radio and cable. They were all in new codes—evidently reserved for emergencies—and we haven't been able to break them yet."

"No word from our own Intelligence in Europe?" Knight asked.

"Nothing that helps. Messages from Rome and Paris indicate that our men know something is going on, but they don't seem to know what it is."

"You don't think a European war's broken out?" queried Doyle.

"No," said Brett, "our agents have several ways of getting such information to us. Beside, there'd be no need of keeping that under cover. They're desperate about something—and that something is here in the United States."

Knight gave him a keen glance.

"What about the Douglas? From the way you took my report, I've an idea that the same thing has occurred elsewhere."

"You're right," said Brett with a grimace. "Whatever it is, that same death has struck down nine people beside those in the Douglas."

"Were the others in a plane?" inquired Knight.

"No, they were a farmer and his family, at a place down in Southern Maryland. A neighbor investigated this morning, after noticing no one had been seen for a day or so. The farmer's family, his hired-hands and all his live stock were dead. The nine people had turned green, but the effect wasn't so noticeable on the cattle."

"Why can't those bodies be examined, sir?" said Doyle.

"Because they're burned up," replied General Brett. "The neighbor called the State Police, and they broadcast orders for some of their men to go to the place. When they arrived, all the buildings

were in flames. They saw one of the bodies, but couldn't get it out before the house collapsed. The man who phoned the police said he heard an explosion just before the fire broke out, but didn't see any one near the place."

"No planes heard?" Knight queried.

"None. I asked particularly, because three ships were stolen last night and I thought an incendiary bomb might have been dropped on that farm."

"Were they Army ships?" asked Knight.

"One," said the general. "It was stolen from Wright Field—I've sent for the details. The others were Navy ships, stolen at Hampton Roads. A sentry and an officer were fatally wounded by the men who did it, but the officer lived long enough to say that one of their assailants was a Russian. Thus the Navy sent for you—because of the international espionage angle."

Doyle made the turn at the District pumping station, sent the car speeding toward Anacostia.

"What type of planes were they?" Knight asked suddenly.

Brett frowned.

"I don't know. The reports are on my desk, but everything has happened so fast I haven't all the details."

"Well, those ships have got to base somewhere," Doyle said practically. "Why not broadcast the theft story on a big hook-up? You're pretty sure to grab one of the birds soon. Then a little third-degree work—"

"I can grasp the idea from there," Brett said drily. "As a matter of fact, we're hoping for the opportunity very soon. A crash was reported two hours ago, somewhere in a woods between here and Annapolis. We're working with Commerce inspectors to locate it with the hope it was one of the stolen ships and that the pilot would be alive."

THERE was a brief silence, while the car rolled through the snowy street to Anacostia Bridge.

"I forgot to tell you," Knight said, "about one gruesome discovery we made. I mentioned that poor chap who had broken one of the Douglas windows. His blood had turned green."

Benita drew a sharp breath.

"Oh, Ricardo—how horrible!"

Even Brett looked shaken. "Then whatever it is," he said thickly, "must affect both the red and white corpuscles. That means a deadly poison."

Knight slowly nodded.

"And the battle over the Douglas proves something else," he said. "The pilots of those foreign ships obviously understand English and also our radio-beacon system. They caught my message to you and immediately dived to get on the beam, so they could bring down the transport. Either there were American pilots in those ships, or else foreign pilots secretly trained for possible action over here."

"That means spies, of course," Brett added harshly. "But why are they over here? What are they after?"

No one answered him, and a grim silence fell over the group. Doyle drove as rapidly as he could, taking the short way around the Navy Yard and along

the waterfront to Potomac Park. The snowfall was lessening, but it was nearing sundown and the sky was heavily gray. Knight looked at Benita and saw that his usually gay young face was clouded.

"I'm sorry, *mi querida*, you had to hear all this," he said to her in Spanish. "I know you must often wonder at this so-called civilization of ours."

She smiled with a trace of sadness.

"There is much I do not understand. Sometimes I think of those other days, back in Lost Valley. It was peaceful there, though we knew nothing of all this wonderful world. With so much to make them happy, it seems strange many people hate each other and wish to kill."

Despite their meaning, the soft Spanish words were like music. Knight listened, his eyes on her lovely, expressive lips. The Girl from Lost Valley . . . She was dressed in the latest fashion now—for in two months she had learned more of the art of smart dress than most women do in a lifetime. But he would always remember her as he first saw her, the girl from the past, in her quaint and colorful costume of olden Spain.

Her nearness, the faint fragrance of her hair, for a moment lessened the horror of what he had seen in the



Douglas. But an exclamation from Doyle brought him back with a jerk.

"Dick! We're being trailed!"

Instinctively, Knight pulled Benita away from the rear window.

"It's the tan coupe," Doyle tossed over his shoulder. "I've been watching it in the mirror, but there's only one bird in it—don't think he'll try anything."

Knight leaned forward to look in the mirror.

"Step on it, then stop suddenly," he directed. Drawing the .38 which he carried under his left arm, he motioned for Benita to keep back in the corner. Brett, a veteran of many battles, showed no trace of excitement. Doyle bore down on the throttle, raced for two hundred feet and then slammed on the brakes. Knight had rolled down the window. With his gun out of sight, he waited. The coupe swerved hastily when the driver saw he could not stop in time.

THE man bent over the wheel, his engine roaring, as he tried to speed on by. The rear wheels spun in the snow,

and for a moment Knight saw the driver's swarthy face. He heard Benita gasp something, then the coupe's wheels took hold and the machine shot around the next turn.

"Let him go," said Knight, as Doyle started in pursuit. "I've learned all we need. His name is Vornoff, and he's one of the attaches at the Soviet Embassy."

Benita caught at his arm excitedly.

"Thees is something most strange! One hour ago, I run into that man, and he act very peculiar."

"Where was this?" Knight exclaimed.

"Up on *la calle* Sixteen and the funny one I cannot pronounce—"

"Sixteenth and H?" said Knight. "What happened?"

"I bump his automobile. A man with him—a very wicked-looking man—stare back at me and send that one to talk."

"Wait," said Knight. His voice held a suppressed emotion. "Describe this other man. What made you call him wicked-looking?"

Benita wrinkled her pretty forehead.

"Because he—he look very much like the picture of the Devil," she said candidly. She smiled at General Brett. "You know, Uncle John—the one you show me last week."

"She means my painting of Mephistopheles and Faust," Brett explained.

"Could you see his eyes?" Knight swiftly asked Benita.

She looked startled.

"Si, but that was what I do not like the most! His eyebrows, they are so very black—his eyes, they not seem—"

"Were they by any chance a queer golden color?" Knight hastily broke in.

"Maybe it is that!" said Benita. "I think at first it is only the eyebrows, they make his eyes look that way."

Knight and the general stared at each other.

"Borzec!" muttered Brett. "If that fiend is here, the stakes must be tremendous."

"Then this man, you know him?" exclaimed Benita.

Knight slowly moved his head.

"The man you saw was Nikolai Borzec, chief of air intelligence for Russia—and probably the shrewdest spy on earth."

"And to think," Doyle said fiercely from in front, "that I once had the chance to drill him!"

"We've an old murder charge we could use against him," Brett said harshly, "but the problem is to catch him."

"He may be hiding in Washington," said Knight. "If we can get word to your spotters before Vornoff reaches the Embassy—"

"We have a direct wire to a house nearby, and two men are always on duty," Brett answered. "Swing up to Constitution Avenue, Doyle—and never mind the red lights!"

Siren blasting, Doyle sent the Army car speeding along the broad avenue on which the Munitions Building was located. Fortunately, traffic in that area was scant, as the Government workers had been dismissed for a half-holiday. The car shot across Seventeenth and raced on toward the Army

Headquarters. As they drew up at the main entrance, Knight saw two of the uniformed door-guards staring into the sky.

In the same moment, the roar of motors became audible. Knight's pulses leaped as he recognized the angry bellows of ships in a furious fight. Above the vibrant roaring came a sharper sound, the pound of high-speed guns.

"Dog-fight!" yelled Doyle. "Listen to that scrap!"

A plunging shape appeared vaguely through the snowy sky. It grew swiftly into the outlines of a Breda 64. Diving furiously after it came a Boeing P-26. The Italian ship zoomed crookedly as the pilot saw the buildings beneath. Guns blasting, the Boeing shot up after it. Both planes were momentarily swallowed up in the gloom, then the Breda reappeared, wobbling down on the verge of a spin. Wings swaying, the Italian fighter dipped toward a small park beyond the Naval Hospital.

"He's going to crash!" shouted Doyle. "Come on!"

All four of them had jumped from the car. Benita sprang back inside, as Brett motioned hurriedly to Knight.

"Go ahead!" said the general. "I'll rush that order about Borzec!"

Knight leaped to the running-board, and Doyle let out the clutch. The Breda was a hundred feet from the ground when its motor abruptly caught. The pilot pulled up, but before he had climbed sixty feet the Boeing pitched down like an avenging Fury. Glowing tracers streaked through the snow. The Breda twisted on its left wing, dropped like a rock. There was a grinding crash, muffled by the roar of the Boeing.

"Straight ahead," Knight flung at Doyle.

THEY raced to the river bank, swung left into the road which bordered the stream. A quarter of a mile away, near an old bridge to lower Georgetown, Knight saw the wrecked Breda. Other cars were swarming toward the scene. The Army machine was within a hundred yards of the crash when the Boeing dived across the road. Its guns clattered, and slugs dug a smoking path in front of the car. Doyle spun the wheel and the car turned almost completely around on the slick paving. Knight jumped to the ground.

"Keep going," he ordered Doyle. "Get Benita away from here."

"No, no—wait!" the girl cried, but Knight did not stop. The Boeing had zoomed again, and his way to the wreck was for the moment clear. The cars which had started for the crash had stopped as the Boeing unleashed its guns. A few pedestrians were running across the bridge, away from the wreck.

A limp arm was all that he could see when he reached the Breda. The rest of the pilot's body was hidden in the crumpled wreckage. He lifted the dangling hand to see if any sign of life remained. The pilot's glove came off, and the hand dropped back loosely. Light from one of the halted cars reflected from a ring on that too-limp hand.

Knight bent over hastily. Against a jet-black background, a tiny white skull was set like a crest.

"Good Lord—the *Arditi*!" he whispered.

The seal of Italy's famous Squadron of Death! It meant that the man crushed in the Breda's cockpit was one of the noted "Hundred"—those reckless ones who had offered to dive headlong with deadly loads of bombs into enemy vessels, if war came. And now, to find one of that fierce band here in the States . . .

He jumped to his feet as the rising roar of the Boeing's engine warned him of another dive. Scarlet dabs of flame played about the ship's guns as the pilot kicked around toward him. Knight flung himself down beside the battered wreck. There was a thudding of bullets into the crumpled plane, a sharp nip at his cheek as a piece of flying dural struck it, then the Boeing zoomed again. He sprang to his feet, braced himself for the attempt to lift the battered wing. The pilot was dead, but there might be some clue in the cockpit . . .

"Ricardo!" Benita's voice suddenly moaned from down the road. "Ricardo the green cloud!"

He whirled, then a cold hand seemed



to close about his heart. A hundred feet away, a cloud of weird green vapor was spreading swiftly toward him!

CHAPTER IV

RIDDLE OF THE THUNDER

WITH his heart pounding madly, Knight streaked down the river bank. Perspiration was running down his forehead when he reached the car. Benita and Doyle sprang to meet him.

"I'm all right," he said hoarsely. He looked back. The sinister cloud was already fading away.

"Where in Heaven's name did that come from?" he asked Doyle unsteadily. Doyle's homely face was white.

"It seemed to come right out of the ground. It was like—"

A chorus of screams broke in on his words. Knight spun around. Near the old bridge, another of the strange green clouds was springing up. A dozen men and women who had just left their cars to approach the wreck were fleeing desperately before that swift-spreading vapor. The greenish mass, bright under one car's headlights, swept out and engulfed all but two men in front. The cries were instantly choked off.

As through an emerald mist, Knight saw the trapped victims tumble to the ground. Benita gave a sob and turned her face away. He helped her into the car, spoke to Doyle in a low voice.

"No telling where it may strike next, and we can't help those poor wretches now."

Doyle hurriedly took the wheel. They were almost at the turn of the road when a deafening explosion shook the air. Knight stared backward. Flame geysers up from the center of the river just as he turned. It was followed by still a third blast, as fire spurted up from a point a block away. Doyle sent the car hurtling back toward the War Department building. As they stopped in front of the main entrance, the ex-Marine turned and looked, taut-faced, at Knight.

"What did it?" he rasped.

"I don't know," Knight muttered. "The explosions seemed to mushroom up from the earth—and the river. They weren't from bombs, for we'd have heard them falling."

"Those poor people!" Benita whispered as they went toward the center door. "Did you see, Ricardo? Some of them had Christmas gifts—maybe for their little ones—"

"I shouldn't have let you go with us," he said huskily.

"The damned butchers!" raged Doyle. "If we only knew how they were doing it!"

Knight's answer was cut off by the clamor of firetrucks rushing past. A police car followed, siren wailing. The inevitable crowd came in the wake of the firetrucks, some on foot, some in cars. The street-lights, flashing on, lit up the scene. Knight and the others hurried on past the excited door-guards and made for General Brett's office. They found him in the Communication Section, surrounded by a group of frantic officers. Buzzers were rasping, and three or four Intelligence men were vainly trying to answer the flood of calls. Brett seized Knight by the arm, led him to his private office.

"We've had a dozen wild reports. What happened?"

Knight told him. Brett looked stunned.

"If they weren't bombs, then the green clouds and the explosions must have been set off by somebody on the ground."

"No one was near enough," said Knight. He lighted a cigarette, stared soberly at Brett through the smoke. "I knew it would come sometime—and now it's here."

"What do you mean?" demanded the older man.

"A silent death weapon."

Brett ran his hands through his gray hair.

"We've got to find the answer—now—tonight! The Chief of Staff just called—the Secretary is on his way—the White House will be after us next."

"The pilot of that Breda was one of the *Aerie Arditi*," Knight said sternly. "The Italian Ambassador can be forced to explain."

"No, we've tried that," interrupted Brett helplessly. "State Department has called the Soviet, Italian and French embassies. They politely say we're crazy, that there aren't any of their ships or pilots over here."

"And we can't produce the proof,"

Knight said bitterly. "That Breda was nearly destroyed by the third explosion, and the fire will do the rest."

The general nodded dully.

"That crash near Annapolis had been destroyed, too—by dynamite. There wasn't any sign of the pilot, but the inspectors found tracks of a car on an old road near there and blood in the snow. Evidently the man was spirited away—dead or alive."

"Probably another *Arditi* pilot," muttered Knight, "or else one of the Reds. Both sides are certainly covering up their tracks. They must be using all the agents in Washington, to move that fast."

Brett was nervously pacing the floor. "They're working together to hide the truth—but it's evident they're fighting each other at the same time."

Knight gazed into space.

"I think the prize is the secret of the silent death weapon. Whatever causes the green clouds must also cause those explosions."

"I still think they were bombs!" Brett jerked out. "The sound of that Boeing kept you from hearing them fall. I'm going to call the listening-posts at Fort Myer and see if they heard any other planes."

He made the call, but before the answer came an orderly appeared from the anteroom.

"The Secretary wants to see you, General," he said.

Brett stood up, motioned to his phone.

"Take the call," he said to Knight. "And see if you can make anything out of those reports on the desk."

HE strode out, bracing himself like a man about to take an icy plunge. Knight looked after him compassionately, then took up the phone. In a few moments he had one of the listening-post sergeants on the wire.

"No, sir, we didn't hear nothin' but the two ships," the man said in answer to his query. "That is, nothin' except a little thunder."

"Thunder?" said Knight quickly.

"Yes, sir—we been hearin' it off an' on ever since Commerce asked us to try to pick up that Douglas. I thought it was kinda funny—thunder with a snowstorm—but th' lieutenant said he'd heard it plenty of times."

"Can you hear it now?" Knight rapped.

There was a pause.

"Yes, sir—it kinda comes an' goes, real deep. Must be lightnin' up above."

"Take a bearing on that sound!" Knight said swiftly.

"Take a bearin' on thunder, sir?" said the sergeant, incredulously.

"Yes," insisted Knight. "See if you can locate the center of it."

He heard mumbled voices at the other end of the line, then silence. He ran his eyes over the littered papers before him. The stolen Army ship had been a P-26 . . . it had been experimentally fitted for high-altitude combat . . . The Navy ships were both Seversky Demonstrators, with the same equipment.

"Hello?" he heard the sergeant exclaim.

"What did you find?" he snapped.

"That thunder's movin' around so fast we can't keep on it, sir! Seems to be everywhere. Can't spot any center at all."

"Keep trained on that sound as close as possible!" Knight interrupted crisply. "Call Fort Washington and have them do the same. Keep both stations plugged in to Communications, and have your bearings transmitted by radio every two minutes on 236 Kilocycles."

"Yes, sir!" said the sergeant. Knight put down the phone, a strange look in his eyes. What was it that Schroeder had said? . . . A deep, heavy rumble, like thunder rolling about the sky and echoing back at you . . .

He scribbled a note, made a hasty call to Bolling Field, and went out to the anteroom. Benita and Doyle were talking together, while distraught officers passed back and forth.

"What's up?" Doyle said anxiously.

A hurrying lieutenant stared at Knight. The free-lance agent brought a careless expression into his face.

"Nothing new. Let's go—the General said for us to take Benita home."

But out in the hall he steered them quickly toward the nearest stairway.

"Benita, I want you to take this note to the General. 'He's in the Secretary's office. Tell the Secretary's aide that 'Q' said it was vitally important.'"

She searched his face fearfully.

"You go—to risk your life, Ricardo?" she faltered.

"Do you remember the people who died in that green cloud?" he said.

She clung to him suddenly, her dark eyes pleading.

"But why mus' you be the one to go? There are so many others—"

Gently, he disengaged her hands.

"There's no time to explain to anyone else, *querida*. I'll be back—*manana*."

"*Manana*," she whispered, then tried to smile as he hurried after Doyle.

Outside, Knight took the wheel of the Army car. Doyle looked sidewise at him as the machine sped down the street.

"Where now?" he said resignedly.

"To a place where we've never been," said Knight, grimly. "And maybe we won't be back."

BACK in the semi-gloom of the old Munitions Building, Benita Navarre watched the tall figure of Richard Knight swing through the doorway.

"*Vaya con Dios, Ricardo*," she whispered, as he disappeared. "May God be with you."

She turned, went down the long corridor. There were but few lights, for most of the building was empty. Other halls, black with shadow, branched off at her left. She stopped, uncertain. This must be the wrong floor. She went back to the center stairway. As she reached the landing half-way to the next floor, a sallow-faced man came down. He was looking past her, and suddenly she heard a furtive step.

"*Teper!* Now!" a sibilant voice hissed.

She sprang aside as the man in front leaped at her. A hand was hastily clasped over her mouth from behind.

She kicked backward at her captor, and he swore in a foreign tongue. Her struggle threw him off balance, and he fell to his knees, dragging her down with him.

She caught at the staircase, tugging with her other hand at the paw held over her mouth. She was abruptly jerked to her feet. Her vanity bag went flying, and she saw the sallow man dash after it. Something moist, oddly pungent, was pressed against her nostrils. She made a last desperate fight to free herself, then her senses whirled and she seemed to fall gently into blackness.

When she recovered consciousness, she was in a big chair in the center of a dimly lighted room. Heavy red curtains covered the windows, and the room was hazy with the smoke of cigarettes. Her head ached dully.

A sour-visaged old woman stood near the door. The sallow man and the swarthy agent, Vornoff, were in front of the chair. Through the doorway, Benita glimpsed a man seated before a radio transmitting set. As she turned her head, Vornoff took a step closer.

"Where is the note?" he snarled.

Benita made no answer. The sallow man looked nervously toward the doorway.

"Not so loud," he said hoarsely. "If he doesn't know there was a note—"

The words choked in his throat as the sinister face of Nikolai Borzec appeared beyond the woman's shoulder. Borzec's strange golden eyes fixed themselves on the sallow man.

"Get out!" he said. "I'll attend to you later."

Cringing, the other man hurried past. Borzec looked from the old woman to Vornoff.

"Well?" he demanded.

Vornoff wet his lips with his tongue.

"I may have misunderstood about there being a note, *Kapeetahn*. Knight may have told her the message for the general. I was hiding back in a side corridor and I did not hear plainly."

He came to a mumbling stop under Borzec's sardonic gaze.

"So you let her trick you! A girl who never even knew of the modern world until two months ago—and you a trained agent!"

Vornoff groaned.

"It was not in her handbag, and Luza has searched her twice. I can't understand—"

Borzec silenced him with a contemptuous gesture and turned to Benita. The weird eyes under his black brows bored into her, but she returned the stare unflinchingly. At last he smiled, and made an ironic little bow.

"My compliments, *Senorita Navarre*. You are, it seems, one of the few beautiful women who think it necessary to exercise their brains."

To her surprise, he had spoken in Spanish. She regarded him with a cool scorn.

"You will learn nothing from me, *senor*. Even if I knew what you wish, I would not tell you."

The pupils of his eyes glittered. "We Russians, *senorita*, have ways of loosening reluctant tongues. I hope I shall not be forced—"

"Kapeetahn!" came a cry from the other room. The radio operator sprang to the doorway, head-set wires dangling. "The War Department is relaying messages to 'Q'—he is in a plane somewhere above Washington!"

Borzec whirled, snatched the paper the man held out. As he read the words, his Satanic face darkened with fury.

"Bungler!" he rasped at Vornoff. "Knight has guessed at least part of the truth—and you let him and that broken-nosed fool slip through your fingers!"

The swarthy agent backed away in panic. "But, Kapeetahn, how could he suspect—"

Borzec cursed him in Russian.

"He suspect enough that two listening-posts are relaying bearings to him!"

"But it is impossible to get accurate ranges! Beside that, with the Northrop there could be no danger."

The Kapeetahn laughed fiercely.

"And you call yourself an agent! I have been here less than five hours, and I know that the Northrop carries the very equipment which could ruin everything. It is a Government plane equipped for espionage purposes. It was recently rebuilt with a specially-braced cabin which can be sealed tight. It has three-stage compressors—" he wheeled to the staring operator. "Call Number 11. Warn him that Knight and Doyle have taken off and will probably be in the danger area within half an hour."

The operator ran back to his set. Borzec turned savagely to Vornoff.

"It is time we were leaving. Bring the girl—if she knows the secret it would be dangerous to leave her here."

"But, Kapeetahn," protested Vornoff, "what if she should try to give the alarm as we pass through the city?"

Borzec smiled down sardonically at Benita.

"Senorita Navarre has such a lovely throat. It would be a pity to have to cut it for her."

CHAPTER V

DEATH IN THE STRATOSPHERE

UNDER a frozen moon, the Northrop climbed steadily. Knight gazed out into the icy void, his eyes ceaselessly searching for some sign of movement. The altimeter hand stood at 42,500, and the Q-plane flew through an eerie sky. Below, there was only a sinister blackness, but above and about them the stars shone frigidly.

They had left the snow-clouds behind at 18,000 feet. The twin-banked Wasp was now on the second stage of the supercharger, as was the special compressor which supplied air at normal pressure to the tightly sealed cockpit. Knight peered back at Doyle. The cockpit lights were off, but the moon shone down through the transparent enclosure and he could see the other man looking out into space.

The Northrop jolted suddenly, shot up on a rising air-current. For the next minute Knight battled the controls, then the pitching ended as abruptly as it had begun.

"What the devil was that?" exclaimed Doyle.

"The tropopause layer," said Knight. "Listen!"

Through the sealed cockpit came a deep, majestic rumble, muffled somewhat by the thickness of the braced cabin. It seemed to come from all directions.

"It's the echo of our own engine," said Knight. "Doyle, we're in the stratosphere!"

The plane seemed to hang motionless in space, not the slightest quiver moving its wings. Doyle gazed out into the moon-lit void, listened for a moment to that slow, deep thunder.

"You were right!" he said in an awed voice. "The answer must be up here, after all."

"Keep watch to the left," Knight told him. "I'll watch on the right. At this speed we'd have little warning."

Doyle looked at the rear air-speed meter.

"We're still showing only 280."

Knight shook his head.

"We're making more than 500. Speed is almost doubled at this altitude."

Doyle swore under his breath.

"I don't like all this business," he muttered. "Closed up in here—it's like being locked in a coffin."

Knight inspected one of the luminous dials before him.

"Be thankful it is sealed tight. If it weren't—"

W-A-R to Q . . . W-A-R to Q . . .

The tiny loud-speaker under the cowl had broken in metalically.

. . . A second thunder-disturbance has just been picked up. Impossible to distinguish from first one now. General area about sixty-mile circle, shifting South of Washington. That is all.

"They've picked up the sound from our Northrop," said Knight.

"I still don't savvy why it sounds like thunder," returned Doyle.

"All air-motion is lateral in the stratosphere," explained Knight. "In this thin air, there's little resistance, and the sound spreads out over a wide area."

"Just about the way we'll be spread out," growled Doyle, "if anything goes wrong and this bus heads down at 500 per!"

Knight laughed, but it was a forced laugh. During the conversion of the Northrop for high-altitude flights he had conferred with stratosphere experts, and he knew their danger was far more than Doyle dreamed. The ship was now at nearly 48,000 feet, and the pressure outside was only about one-ninth of the normal air inside. If the sealed cockpit should burst from the internal pressure, Doyle and he would suffer a horrible death. In the sudden change, their hearts and lungs, built for sea-level pressure, would expand enormously and probably explode. So would most of their other organs.

He drove away the ugly thought, ran his eyes across the double row of instruments. The superchargers were now running at triple-stage, and he could feel the added power of the droning engine. The temperature outside was 69 below, but it was pleasantly warm

within the cabin. Compressing the rarefied air to normal pressure raised its temperature to a terrific degree. It was necessary to by-pass it through cooling fins outside to bring it down to a temperature they could stand. He had been forced to shut off the electrical heater at 22,000 feet.

W-A-R to Q . . .

The loud-speaker had again cut in on his thoughts. . . . There seems to be a third disturbance. Cannot get accurate bearing. General Brett requests that you re—

There was a sharp crack, and the voice ended.

"That sounded like a pistol shot!" yelled Doyle.

"Borzec's spies must have broken into the station," Knight said harshly. "We were getting too close to—"

He flung his head back, stared upward. It had been for only an instant, but something had seemed to flit across the face of the moon. He started to bank. That scudding shadow had appeared to be moving West . . .

"Dick! There's a ship!" Doyle shouted.

Knight jerked around. A small plane was racing in from their left quarter. As he spun around, faint tracer lines smoked through the icy sky. He instinctively shoved on the rudder.

The Northrop skidded dizzily—and the other plane vanished!

ASTOUNDED, Knight ruddered into a straight flight. Doyle was gaping up through the transparent top.

"Lord!" he said in a stunned voice. "If we'd even ticked wings . . ."

Something shone for an instant in the cold moonlight, then the other ship reappeared. Knight braced himself, gloved fingers taut on the stick. This was not fighting—this was stark madness! At these speeds—

"Look out!" howled Doyle. "There's another ship!"

Knight took one look and froze. There was a roar, a vast blur of light, and the hurtling giant was gone. The Northrop slewed crazily in the wake of the monster. In his frantic attempt to keep it out of a dive, he had no time to look for the other ships. His first warning was the heavy pound of Doyle's .50-guns.

"Turn right!" Doyle shouted wildly. "That devil's going to crash us!"

Knight barely moved the controls, for he knew now what to expect. His safety-belt gave a fierce pull as the two-seater swerved, and he heard Doyle thud against the side of the cockpit. The smaller plane streaked by, twisting around in a turn. As it cut in parallel he saw that it was a Seversky Demonstrator. Its guns blazed, and the pilot flicked the nose toward the racing Northrop. Knight snapped the throttle back, and the Seversky's pale tracers curved off into space. In a flash, the stolen Navy ship was half a mile away.

He opened the throttle hastily, for the Northrop was squashing down in the thin air. As the ship picked up speed again, Doyle spoke in a muffled voice.

"Hold her straight a second, Dick—"

"I've got to tighten my belt."

"Are you hurt?" Knight said anxiously.

"No—just banged my head—all set now."

The Seversky had slipped off in a turn, was climbing to regain its altitude. Knight tripped the Browning .30's outside the arc of the prop. He could barely see the tracers, for the lack of oxygen kept them from burning fully. But they were enough to guide him as he swung toward the climbing Seversky.

The other ship started to turn. He banked to follow, and for an instant they raced—two hundred yards apart—through the frigid sky. Knight dared not rudder closer. The slightest error, and the Northrop would crash sideways through the stolen plane.

He eased the throttle a hundredth of an inch to drop behind the Seversky. The stolen plane leaped five hundred feet ahead. He pressed the rudder pedals to rake it with his tracers. The gray phosphorous streaks bent sideways, missing the Navy ship by hardly a dozen feet. Before he could swing back, the other pilot zoomed.

It was like black magic—for the ship was there one second and had vanished in the next. Knight pulled up, straining his eyes to see that flitting shape. There came a sudden glow, and a magnesium torch bloomed with a sickly light. The Seversky pilot had released a parachute flare.

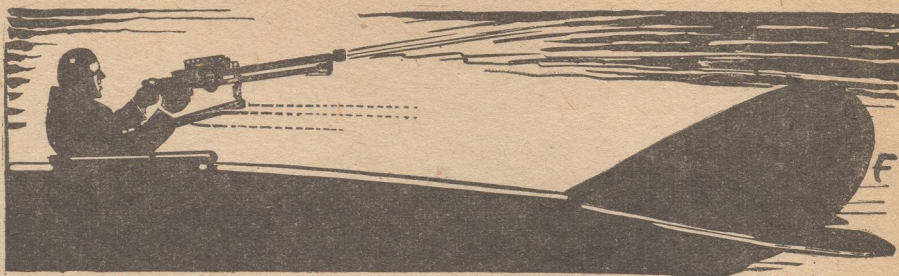
Knight hurriedly swerved, for to hit the flare at that speed would have meant disaster. The hasty maneuver almost took the blood from his brain. He shoved the stick forward, flew level for an instant. Then above the drone of the radial came a deeper, though muted, roar. Blind instinct made him climb as fast as he could. Something flashed by on his left, and a moment later he saw a monster ship curving back in a turn.

Like two fierce eyes, guns blazed from above its control cabin. With swift decision, he skidded to pass behind it. Doyle gave a shout of dismay, and just in time he saw the Seversky plunging back to attack. He was braced on the rudder pedals for a quick turn either way. There was only one possible move. Grimly, he pitched the Northrop between their two attackers.

The gunfire ceased at once, and for a tense moment he had a clear view of the giant. It was a huge amphibian, somewhat resembling a Clipper, but he knew it at once for an Italian Macchi.

Even so, it was larger than any Macchi he had ever seen, and he realized it must have been secretly built. Four engines juttied above its mighty wing, and he knew that there must be three or four-stage compressors geared with each of those motors.

In some of the window-ports, machine-guns were swiveled, with special connections to keep the huge ship airtight. The twin-guns above the pilots' compartment were controlled by some mechanism below, and as the Northrop shot alongside he saw the guns whirl toward him. A face glared out in baffled rage as the man controlling the guns saw the Seversky beyond.



IT was only a second that the three ships flew in that checkmate position. Then the Northrop vibrated under the recoil of Doyle's guns. The Seversky pilot pulled up frantically. Knight shot the Northrop up beside it to keep the Macchi gunners from blasting them from the sky. Doyle's tracers were bending behind the Seversky in a wide arc, but with an oath he struggled to bring his shots forward.

In a violent turn, the stolen Navy ship whipped away and was gone. Doyle swore fluently.

"Damn that wind! I was almost on, and I couldn't budge th' guns another inch!"

Knight had whirled back to the left. It was a desperate turn which almost blacked-out his senses, but the huge Macchi was plunging up behind them. Though his bank was fairly tight, the Northrop shot dizzily across the sky, leaving the Macchi more than a mile away.

More than a mile . . . and then they were hurtling together at frightful speed. The amphibian seemed to swell to gigantic proportions as it pitched toward them. Knight saw the flame of the swiveled twin-guns, saw the swiftly changed angle as the guns tilted up to catch them as they passed. With a shout of warning to Doyle, he back-sticked and booted the pedals.

The Northrop flung itself up and went into a shrieking skid for all of two hundred yards. The Macchi was trying to twist back before they could pick up speed. Knight nosed down, and the sealed two-seater roared down at the pivoting monster.

The Macchi's guns blazed frenziedly up at them. Knight held his breath, thinking of what would happen if the cockpit were even pierced. A bare pressure on the pedals, and the Northrop was two hundred feet clear of those pale, deadly tracers.

But in a flash the Macchi was again plunging in; and Doyle once more swung his guns and probed across at its cabin. Knight shifted the stick for a straight-on dive—and then the Seversky dropped from the heavens!

Wings glinting under the moon, it screamed in at the Northrop. Knight's hand was already pressing the gun-controls on the stick as the great Macchi slid beneath their left wing. With a shove at the rudder, he squeezed all four stick-buttons.

Four guns flamed from the wing of the Northrop. Their pallid lightning tore across the Seversky's wing and through the cockpit enclosure. The riddled wing broke off, and with a terrible roar the Seversky went to pieces, hurling the wretched pilot from the cockpit.

Fire whirled up in weird plumes as Knight dived madly toward the stricken ship.

For a hundredth of a second, it was like a plunge into a furnace. Blinded by the glare, he thought they were doomed. Then at terrific speed the Northrop shot underneath and they plunged on into the night.

It was hardly five seconds later when he pulled up into a turn. He could hardly believe his senses when he looked back. For that plummeting mass of fire which was the Seversky was thirty miles behind them!

Far across the sky he saw it as it fell, a thing so remote in that icy sky that it seemed impossible they could have been there to cause that holocaust. A strange thrill passed over him as they raced back in the glow of the moon. Speeds such as these stirred a man's very soul. They were almost beyond the power of the mind to realize.

"Good Lord!" he heard Doyle's awed exclamation. "We must be makin' six hundred miles an hour!"

Knight flicked a glance at the air-speed meter. It registered 344, their maximum speed at sea-level. Up here, with air particles thin and far apart, it did not show any increase, but he knew it must almost be doubled. The thought of the figures staggered him—688 miles an hour—more than nine hundred feet a second!

HE cautiously swung the Northrop in a wide circle above the falling Seversky. He thought they had lost the Macchi, then he saw it circling also, below and a mile away.

"There they are!" grated Doyle. "What are we waiting for?"

Knight stared down at the monster. "I'm going to wait and see what they're up to. We've only a hundred to one chance of getting them this way."

Doyle watched the wheeling Macchi through the side of the Northrop's enclosure.

"It's got me stumped," he muttered. "We've no scrap with Italy. What are they doing over here, anyway?"

"I've a hunch," said Knight, "that they're not Italians."

"You mean somebody grabbed off the ship?" demanded Doyle.

"It's the most likely answer," replied Knight. He watched the Macchi a minute longer, then reached down to the radio switches. "W-A-R must've been wrecked. General Brett might be calling from Bolling or some other station."

Doyle took the stick while he tried to pick up the Air Corps operator. There was no result. He tried other wavelengths, shook his head.

"The receiver's dead. Those violent turns probably pulled some connections or wrecked a tube."

"A fine mess," growled Doyle. "Now we don't even know where we are. The speed we're making we might be anywhere."

Knight gazed down at the huge Macchi, now barely visible below them.

"I wonder what they're waiting for."

"It can't be us," said Doyle, "or they'd be hopping up here pronto. I guess they think we lost 'em."

"They're straightening out," Knight said sharply. "I'll take over—I can see them better."

He maneuvered to keep the wings of the big foreign ship gleaming in the moonlight. The Macchi was now nosing down, and in a few moments he saw they were catching up with it. He reduced their speed, took a hasty glance at the compass.

"Due North—where can they be headed for?"

"Maybe the North Pole," said Doyle. "And if you've got any idea of chasing them, you can drop me off."

The Macchi glided North for fifteen minutes, then turned and swung straight South. Knight frowned at the altimeter. They were down to 28,000 feet. In a few minutes they would be in the snow-clouds again. But to his relief they came into broken clouds at 21,000, and there was no snow. It was harder to keep sight of the Macchi, but as they went farther South the clouds diminished until finally they were in clear air at nine thousand.

Below, stretched the lighted Washington-to-Memphis airway with its slowly rotating beacons. Almost directly beneath was one of the new intermediate fields, an L-shaped clearing in the midst of a woods. Its red, green and white lights twinkled up against the background of snow like lights on a tinsel Christmas tree.

The Macchi glided on. Knight kept behind it, but far enough not to be seen. They passed above an airway beacon, and then, beyond a second one, he saw the lights of another intermediate field. The big amphibian seemed to be heading straight for it. He hurriedly banked the Northrop, raced back toward the L-shaped field they had first seen.

"What's the idea?" erupted Doyle.

"Have to use teletype or phone to warn Brett where that ship is," clipped Knight. "They'd hear our transmitter and take off again."

"You know where we are?" said Doyle.

"Yes, this is one of the new fields north of Lynchburg. Brett can have a flock of ships down there in half an hour—and get police from the nearest towns to close in on that field."

The Northrop moaned down over the trees. Knight lowered the landing-gear, took a quick glance at the illuminated wind-sock, and kicked into the wind. The snow was not deep, as he could see from the boundary light standards. As the wheels crunched into it, Doyle let out an explosive sigh.

"Thank the Lord! I never expected

to feel good old earth under our wheels again."

"I wasn't so sure of it myself," admitted Knight. He let the ship roll toward the caretaker's house at the side of the clearing. Atop its steel tower, the field beacon slowly and ceaselessly rotated, making the field alternately bright and shadowy.

Leaving the engine at idling, Knight unlocked the enclosure gear, and moved back the transparent top. Doyle came after him as he ran to the house. The caretaker had not appeared, but they had landed against the wind, thus the sound had evidently been lost. He threw open the door unceremoniously and stepped inside, with Doyle at his heels. Then they both stopped, paralyzed.

"Come inside, gentlemen," came the sardonic voice of Nikolai Borzec. "It is somewhat unexpected—but I am always glad to see old friends."

CHAPTER VI

THE MAN WITH THE GOLDEN EYES

DOYLE groaned. Knight stood motionless, trying to hide the shock of seeing the Russian. At Borzec's right he recognized Alex Vornoff. On the left was a sallow man, and farther back he saw a burly figure standing guard over the frightened caretaker. All three of Borzec's men had guns, and Borzec's right hand was hidden significantly in his overcoat pocket.

For an instant after Borzec's ironic greeting there was no sound but the clicking of the teletype machine and the low-pitched buzz of the anemometer indicating the wind-force. Then Vornoff spoke in a fearful tone.

"Kapeetahn! What if they sent word to bring others here?"

"They obviously landed here for that purpose," said Borzec calmly. "They were following the Macchi, and they



thought it was landing at the other field. They were afraid to use their radio."

He removed his hand from his pocket, in it was a small Mannlicher pistol.

"If you would be so kind," he said to Knight, "step inside and tell your homely friend to do the same. It is a little cold with the door open."

They had hardly obeyed when a low rumble became audible.

"It is the Macchi!" said Borzec. He gestured to the burly agent. "Take that trembling *cherf* out to the power-shed and have him stop the beacon so that it shines on the field."

The big man hustled the caretaker from the building. Borzec glanced toward a closed door at the other end of the room, then looked at Knight with an odd light in his golden eyes.

"I am glad you are here, Q—you see, I have finally penetrated your veil of secrecy. But I have still another reason. However, that can wait."

He spoke curtly to Vornoff and the sallow man, and the two agents stepped behind the captives, Knight felt the pressure of a pistol against his back. Borzec turned and raised a curtain so he could look out onto the field.

The beacon made a white swath across the snow. Knight heard the rumble of the Macchi's engines die away. Borzec stiffened, and Knight saw the knuckles of his clenched fist tighten. There was an interval of half a minute, then the giant ship loomed into sight at the farther end of the field. Its wheels had been run down into position, and Knight watched in fascination as the monster swooped toward the ground.

The huge wheels touched, left the ground, touched again. Borzec swore fiercely in Russian. The Macchi was plunging straight toward the house!

"We'll be killed!" Vornoff cried from back of Knight. Chekal has lost control!"

Knight tensed for a leap as he felt the gun relax its pressure, but the Macchi abruptly slowed its precipitous plunge and the nose swung grudgingly away from the building. It came to a stop less than a hundred feet away, its propellers flashing in the light as though angry at being cheated of their human prey.

A small, heavy door in the side of the huge ship's control compartment was hastily opened, and a gaunt figure climbed down. As the man neared the house, Knight recognized the face which had glared at him when the Seversky blocked the fire of the twin-guns.

Borzec threw open the door, and the gaunt man hurried inside. His face was sickly white, and his hands shook as he took off his gloves.

"Mad! We were mad!" he said hoarsely. "I have died a hundred times up there!"

"The worst is over, Chekal," Borzec answered.

"But we were attacked again—" Chekal's gaunt face twisted with sudden fury as he saw the prisoners. "Nikolai! These two were the very devils who almost crashed into us! They killed Number Eleven—blew the Seversky to pieces in front of our eyes!"

BORZEC'S strange eyes blazed at Knight. "Another item to add to our score, Mr. Q!" He wheeled back to the infuriated Chekal. "They will be attended to, never fear. But we must fuel the Macchi and be off again. This time, there will be enough petrol to carry us straight to Russia—high over this damned country, the Pacific, and Japan."

"I have bad news," Chekal said harshly. "Just as we were landing, the Italian prisoner broke loose. He destroyed both master compasses."

"You imbecile!" snarled Borzec. "Without them there is no way—" he stopped, looked out of the window, then an ugly smile curled his lips. "Perhaps

it was Fate that sent you to us, Mr. Knight. The compass of your plane will serve us very well."

"But they are not corrected for the Macchi," Chekal objected. "And it would take hours—"

"We can correct them in the air," snapped Borzec. "By flying along one of the raidobeacon courses, it will be simple to find the error. Once the corrections are made, we will be ready. Besides we can climb up and navigate by the stars."

"But there are hundreds of those beacons. Ivan was the only one who knew them perfectly—"

"We have an expert with us," Borzec said ironically. "Mr. Knight will help us."

"He might trick us—set the compass wrong," said Chekal anxiously.

"I think not," said Borzec. Again, the peculiar smile played around his lips. Then his sardonic face hardened. "Vornoff, get out and superintend the refueling. There is a mail-plane due over here in forty minutes and we must be away before then."

Vornoff went out. Knight looked through the nearest window and saw a large gasoline truck moving toward the Macchi. Evidently, Borzec had made arrangements with some crooked dealer or had seized the truck by some means. The main door to the Macchi's cabin was now open, and more than a dozen men were swarming about the huge ship.

The burly agent came in with the caretaker. Borzec stepped to the teletype machine, looked down at the printed words on the tape.

"They are asking for a weather report," he said sharply to the caretaker. "Answer them, but one hint of trouble here and you will be dead."

Knight stole a sidelong look at Doyle, but the sallow guard behind them instantly jabbed him with his gun.

"Stand still," he ordered in English. "Keep looking to the front."

Chekal dropped wearily into a chair, his eyes on the feverish operations outside.

"Are you sure we're safe here?" he muttered to Borzec.

"Yes, barring an accident," snapped the other. "It is Christmas Eve, and most of the bourgeois fools are at home. I selected the most remote field possible."

"I thought your message would never come," the gaunt Russian said harshly.

Borzec gave him a savage glance.

"It would have been sooner, but for your insane trick with that passenger plane. I warned you not to use the rocket-gun, especially after one of the Reggio charges fell and killed some farmers in this country during our Atlantic fight.

"I couldn't help it," Chekal said fiercely. "We were following that radio beam, trying to find where we were, and the passenger ship suddenly appeared up under us during the snow-fall. They saw us at once, and I was afraid they would report it by radio. There was no time to get the machine-gunners to their posts. I trained the

rocket-gun straight down and fired in to the cabin."

"You should have followed it with an explosive charge," said Borzec irritably.

"I tried to, but I lost sight of the plane. I was hunting for it when I heard the man named Q report it. And then you ordered the Morane Saulnier to bring it down."

BORZEC pointed to Knight. "There is your Q-man. He and that ugly donkey nearly ruined our work. One of the Breda pilots from the Italian cruiser heard the alarm and he jumped into the fight. Later he ran into the agent who stole the Boeing plane, and he was shot down in Washington. That's why



we flashed you word to fire a rocket barrage on that point—we were afraid he might be carrying orders which would give everything away."

Chekal's gaunt face twitched.

"May I never meet another of the *Arditi*! They are madmen—ready to kill themselves the same as the Japanese."

"The last one has been finished," said Borzec. "And Vornoff and I covered up the crash of the one which we downed this noon."

Chekal looked at him with a grim admiration.

"You took a great chance, dropping in a parachute without knowing what was below."

"I am used to taking chances," Borzec said coolly. "And I do not need dope to bolster up my nerves."

Chekal stood up, his emaciated face a dark red. But the entrance of Vornoff cut off whatever reply he was about to make.

"The main tanks are filled," Vornoff reported. "The reserve tanks will be full in a few minutes."

"So quick as that," Chekal mumbled. "And to think if we had only a few minutes more, after that tanker finally located us—"

"Get out and start the motors as soon as the reserve tanks are filled," Borzec sharply interrupted. He turned and stepped squarely in front of Knight. "Now, my dear Mr. Q, I shall give you a chance to help us."

Knight looked him steadily in the face.

"Save your breath, Borzec. I won't do it—and torture won't change my mind."

The Russian smiled with a mirthless humor.

"I wonder . . . perhaps you will reconsider." He spoke to the burly agent, nodded carelessly.

The big man grinned, seized the caretaker and dragged him toward the closed room. Knight saw the door open, then the two men went out of his view. He heard the caretaker cry out, heard the sound change to a gasping moan.

There was an ominous thud, as of a body falling to the floor. A few seconds passed, and then the agent's heavy shoes clumped on the floor. Knight could tell he was dragging something. Borzec's smile broadened.

"This way, Kursk. I wish our friends to have a better view."

Knight's jaw hardened.

"The sight of a corpse isn't going to make any difference, Borzec!"

"But this isn't a corpse," said the Russian silkily. "At least—not yet."

Knight's head turned. Then all the blood went out of his face and he stood there, sick and stunned. For the gagged figure before him was that of Benita Navarrel!

He took a stumbling step toward her, but Borzec raised his pistol.

"Not so fast, if you please. Kursk, will you remove the *senorita's* gag?"

Kursk jerked the binding cord away, and the wadded cloth dropped from Benita's mouth.

"Ricardo!" she moaned. "Why—oh, why did you come?"

His eyes filmed. She thought he had come to save her—and he knew they were close to death.

"Keep a stout heart, *querida*," he said in a husky voice. "We'll come out of this all right."

She tried to reach out and touch his hand, but Kursk roughly pulled her back. Borzec's golden eyes glittered, as he saw the rage in Knight's face.

"So Vornoff was right, and there is a romance here. Now, my dear Ricardo, I give you one more chance. Will you pilot the Macchi until the compass has been corrected—or shall I leave three more corpses to keep the other one company?"

He had spoken in Spanish, so that Benita could understand. Knight saw the color go out of her cheeks, though she tried to hide her fear.

"I'll do what you say," he answered grimly, "but only if you let her and Doyle go free before we start."

Borzec shook his head with a mock sadness.

"I regret that is impossible. But when we arrive in Russia, the *senorita* will be freed."

Knight knew that he was lying, but there was only one course he could take.

"Very well," he said. "I agree."

AS though his words had been a signal, one of the Macchi's engines broke into a low rumbling. As Knight and the others were marched out to the ship, the other engines whirled into life. The tank had been driven to one side, and most of the crew had entered the ship. The Northrop stood forlornly on the right, its engine silent.

Borzec gave an order, and Doyle and Benita were taken to the main door of the cabin. Knight looked down the muzzle of Kursk's gun, started to climb the dural steps to the control compartment. But Borzec halted him.

"One moment. Vornoff, it may be well to search our guest."

Knight's hope sank. He had prayed that they might continue to overlook that point. Borzec smiled unpleasantly as Vornoff took the .38 from Knight's

arm-pit holster.

"You don't mind, I trust. Kursk, go back and perform the same service for the gentleman with the crooked nose. Lock him and the senorita in with the other prisoner and guard the state-room door."

Kursk lumbered back to the main door. Vornoff looked toward the driver of the gasoline truck, who was staring at the huge Macchi.

"He will be taken care of before an hour is up," Borzec said meaningly. "I have planned carefully, and when this affair is ended there will be no loose tongues left to wag."

Knight caught the look of grim amusement which flitted into the man's weird eyes. He knew what Borzec was thinking. Benita, Doyle, and he were slated to die.

CHAPTER VII

THE SECRET OF SILENT DOOM

STEADILY climbing, the giant Macchi forged on through the blackness. Knight sat in the co-pilot's seat beside the gaunt-faced Chekal. His hands were bound to the arms of the seat, and his feet to the round dural girder on which the control yokes were fastened. Head-phones covered his ears.

The altimeter showed 4300 feet. They had run into snow almost at once and were now flying on instruments. The emaciated Russian bent grimly over the wheel, staring into the storm. There were no lights in the compartment, but the luminous hands and figures of the dials on the two-paneled board gave an eerie reflection. Knight could see Borzec's evil face dimly mirrored in the heavy glass bay before him. The senior OGPU agent was standing in the aisle between the two seats. Now and then, Knight could hear him say something to Vornoff, who was leaning back against the closed door to the next compartment.

Chekal looked down at the two compasses of the Northrop, which had been hastily installed. Then he scowled across at Knight.

"We will correct the left one. Give me the directions."

Knight's face was devoid of expression.

"Turn slowly to the right . . . now hold your course."

Chekal muttered under his breath. Knight waited until he heard the "A" signal change to a series of steady buzzes.

"The compass should read 267 true," he said curtly.

Chekal peered down at the compass card.

"An error of nine degrees East," he said gruffly, "if wind direction has not changed since we took off."

Borzec stepped close to Knight.

"If you should make a mistake, it would be most—unhealthy."

Knight gazed straight ahead. "I am not through. To make certain, we'll have to fly through the 'cone of silence' and down the other leg of the beam."

"Kapeetahn, this is some trick," Vornoff said nervously.

"Keep still," snapped Borzec. "He would not take the chance, while the woman he loves is on board."

The Macchi ploughed on through the murk, while Knight gave terse directions to Chekal. Between his curt orders, he let his narrowed eyes steal over the instruments. There was one device with a dummy compass, made with extreme accuracy, to duplicate the reading of the real compasses. It came to him suddenly that this was part of the control for the rocket-gun Chekal had mentioned. It was like a fire-control apparatus on a battleship. Course, speed, altitude, wind and other factors could be set on the various dials. There was a brass lever which he guessed to be connected with the rocket-gun.

"We're at two thousand meters," Chekal said abruptly to Borzec. "We had better seal the ship at this pressure."

Borzec nodded. Chekal switched on the automatic gyro-pilot to free his hands for other work. Knight watched every motion. The gaunt Russian pressed a button, and a siren shrieked through the plane. Almost at once, a green light glowed on the instrument board, then a second, and two more in quick succession.

"All four compartments sealed off!" a voice said from a speaker above Knight's head.

Chekal looked at the indicator on the heavy door through which Knight and the others had entered. Then he reached out and spun a huge valve on the lower instrument board. There was no apparent change, but Knight knew that the ship's compressors were now supplying all the air for the giant plane. From now on until the ship was unsealed, the pressure should remain the same—unless by some ill-chance the superchargers should fail.

The radiobeacon signals in Knight's phones now grew louder, then suddenly ceased. In a moment they sounded again, and he knew the Macchi had flown directly over the sending station. He waited, masking his tension, but no voice broke in on the monotonous buzz. It had been his hope that the huge ship would be heard flying over and an inquiry made which, if unanswered, would start a flood of messages over the airways system. Such a flood would not escape Brett's attention, and in connection with the note. . . .

HE cursed himself silently. The note! In his fear for Benita's safety, he had forgotten all else. Perhaps the note had never reached Brett. If Borzec's spies could get into the War Department radio station, they might easily have been in the building when he left Benita. . . .

"It's getting too warm," said Borzec. "Send more air through the cooling fins."

Chekal opened a by-pass valve, and the temperature in the compartment sank back to normal. Borzec looked sharply at Knight.

"Have we passed the critical point?"

Knight dully nodded.

"We're on the other leg of the beacon. Your compass variation is 13 East . . .

declination in this area is about 4 West. That makes the error of 9 East that Chekal stated."

"Your estimate had better be correct," Borzec said coldly. "Vornoff, unfasten the ropes and put him back with the others."

"But shouldn't we—" said Vornoff, and stopped.

Knight saw Borzec's quick frown in the reflection on the glass bay before him. Vornoff untied his bonds, covered him as he stepped down. Borzec opened the door to the next compartment and Knight passed through. A bluish light gave a vague illumination, and he saw Kursk standing guard before the door of a stateroom on the right. There was a duplicate room on the left, and a curved, widening aisle between the two. The aisle ended with a semi-circular space just forward of the next bulkhead, and projecting up from the floor in the center of this space was what looked like the breech of a three-inch gun.

Electric cables ran from the side of the breech to a switchboard on the bulkhead. On both walls were racks containing long, sinister-looking rockets painted red, green and yellow. Another calculating device stood near the switchboard, and Knight saw a glass section in the floor. There was evidently a sliding trap in the hull so that the weapon could be whirled around in any direction. From what Chekal and Borzec had said, the rocket-gun could be accurately fired on an unseen target. The glass section was apparently for use in aiming at visible targets.

Kursk had unlocked the stateroom door. At Vornoff's order, he seized Knight by the arm and gave him a violent push. Knight stumbled into the room, and the door slammed behind him.

Benita and Doyle were bending over a figure in a narrow bunk as he was shoved into the stateroom. They both spun around. A look of vast relief flashed into Benita's eyes. She sprang toward him with an incoherent cry. He managed a twisted smile as she looked up at him.

"I was so afraid," she whispered, "afraid that terrible one had kill' you."

"Killed!" mumbled the old man in the bunk. His bandaged head tossed on the tiny pillow. "All killed . . ." he subsided into a low muttering, his eyes closed.

Doyle met Knight's gaze.

"You were right," he said in an undertone. "The Reds stole the Macchi. Borzec hatched the whole scheme, after the Soviet found out that Italy had developed a stratosphere plane with some new, deadly weapon. Signor Reggio here gave us the lowdown—he's the one who invented the rockets and the green gas. Borzec and Chekal used the stuff to wipe out a mob of guards. They had their men all set, and they'd have got the ship into Russia if it hadn't been for the Arditi. They'd been experimenting with stratosphere fighters—closed cockpits and oxygen suits. A dozen of 'em took off and chased the Macchi into the Mediterranean. They could fly as high as the Macchi, and then they finally

forced the Reds out into the Atlantic." The old Italian inventor opened his eyes.

"*Gli Arditi!*" he lapsed into his native tongue. "Brave men . . . they die for Italy. The Russians . . . try to turn back . . . *Arditi* fight to crash the big plane . . . they chase until their fuel is gone—then they fall into the ocean."

He shook with a spasm of coughing. Benita bent over him.

"You mus' not talk—you rest now."

The old man feebly nodded. Doyle turned back to Knight.

"There was one hell of a fight," he said in a lowered voice. "Certain Communists in France were partly in on it and ready to help. Italy radioed the German catapult ship in the Azores to shoot off a plane and try to intercept the Macchi. England decoded the message, according to what the old man overheard—they kidnapped him to get the gas formula. But the English planes didn't get off in time to catch up."

"The Macchi must have run out of fuel," said Knight. "That would explain what Chekal said about the tanker."

DOYLE wagged his head. "*Signor* Reggio told us the whole thing. The Macchi came down a hundred miles off the Virginia coast. They'd sent a code for help, but it took a French Communist tanker almost two days to find them—they were afraid to send any message after they landed. Italy and France had both rushed out cruisers with planes, and they barged in just as the Macchi was fueling. The big bus just got off in the nick of time. It must have been in that scrap when one of the gas-rockets over-carried and dropped in Maryland. Borzec's superiors heard the police broadcast later, and flashed him word to blast the farm with incendiary rockets. They were afraid an autopsy would give away the secret of the gas."

Knight stared from him to the old Italian. "Then the rocket that over-carried must have gone two or three hundred miles!"

Signor Reggio turned his bandaged head. "They will go farther than that, much farther! From the ceiling-height of this plane . . . it is nearly eighty thousand feet . . . they will go 470 miles. There are successive charges which keep exploding . . . But that is not what these devils wished most." He waved Benita aside, pulled himself up in the bunk. "It was the secret of their silence! That fiend with the golden eyes had seen one of the tests. There is no shriek as with a shell from a gun. The air blows through tiny perforations, and once the rockets are fired they reach a speed of 3400 feet a second. The sound they make is so high the human ear does not hear it."

"I know," Knight said, with a grim smile. "One of the gas-rockets almost finished me."

The old man laughed crazily.

"The gas . . . it is my greatest achievement. It goes through the lungs . . . into the blood in only a few seconds. The corpuscles turn green—"

Another spasm shook him, and he slipped down, only half-conscious.

"He's made a swell present to the world," Doyle muttered. "That long-range stuff is bad enough. They can hop up into the stratosphere and drop rockets on a country four hundred miles away. And think of sitting up 80,000 feet in the stratosphere and potting down gas and fire rockets on New York that don't even make a peep to warn anybody."

Knight's face grew haggard.

"I know—I've been thinking of it. That and—" he glanced at Benita and did not finish. She looked at him gravely.

"Ricardo, I have fail' you, the first time you ask me to help you. The note—I push it over the railing on the stair, when those men jump at me. I guess nobody find it down below."

"Never mind," he said. "It wouldn't have worked, anyway. We're heading the wrong way."

"What was your idea?" said Doyle. "You said something about an attack plan—"

"I wrote down a suggestion for a sort of barrage," explained Knight. "I'd guessed it was a stratosphere plane,



though I didn't know what it was all about. I asked the general to have all listening-posts along the coast try to catch that 'thunder' and report straight to him. He could have Army ships standing by with oxygen equipment, and rush two or three squadrons up near the center of the sound. But I never counted on the plane's heading for the Pacific. I had a hunch it had been flown over from Europe to test some new death weapon on us, and that they'd head back across the Atlantic if they got in a jam."

"They must be scared of running into the *Arditi* again," said Doyle.

Knight nodded dispiritedly. "Probably afraid of England and Germany, too. They've also been experimenting with high-altitude ship and might be able to intercept this plane."

THERE was a pause, while they listened to the muffled roar of the speeding ship. Then their eyes met again.

"We can't stand here and wait for them to finish us off," muttered Knight. "And that's what they'll do as soon as there's no chance of needing us again."

"The trap . . . they will throw you through the trap under the rocket-gun," the half-delirious inventor suddenly cackled. "They go down to where it is safe to unseal the cabin . . . then they laugh and throw you out . . . that is what they did to my assistant."

Benita turned deathly pale. Knight glared at the old man, then wheeled back to Doyle and lowered his voice to a whisper.

"Our only chance is to rush the con-

trol compartment. That means getting Kursk—"

Doyle shook his head glumly. "The door's locked good and tight. And he'll start shooting if we try to bust it down."

Knight stared savagely around the stateroom. There was a small closet. He opened it, hoping to find a weapon. The closet was empty. He was about to shut the door when his eyes fell on several electric cables which ran along the bulkhead. He seized Doyle by the arm, pointed tensely.

"Holy cats!" whispered Doyle. "If they're what I think . . ."

They hurriedly set to work. Four minutes later, one of the rumbling engines abruptly went dead. The speed of the ship diminished, then the other engines revved up and the Macchi thundered on.

"We'll have to plug another one," grated Doyle.

"Wait!" said Knight. "I think they're turning back."

Benita suddenly caught at his arm. He followed her frantic gesture and saw a streak of bright light under the stateroom door. He sprang to one side, just as the door burst open. Gun in one hand, flashlight in the other, Vornoff stood in the passage. Behind him, a shadowy bulk in the bluish light, loomed Kursk.

The flashlight's rays fell squarely upon Doyle, as he spun around by the closet. Vornoff lunged through the doorway. Knight's right hand shot out and wrenched the gun away. Vornoff gave a wild shout of alarm and jumped back, dropping the torch.

The light flipped over Kursk's startled face, the gun in his hairy paw. Knight fired, and the hulking agent tottered back with a bullet through his side. With a hoarse bellow, the wounded man lifted his pistol. Flame spurted from the muzzle. The bullet ricocheted from the metal doorframe, snarled past Knight, and pierced Reggio's head.

Vornoff was fleeing madly toward the after compartments. The torch he had dropped went rolling across the floor as the Macchi steeply banked. Knight leaped through the stateroom doorway. Kursk had fallen to his knees, thrown off balance by the steep turn. Knight slammed the barrel of his gun against the man's huge head, and Kursk went down with a groan.

Doyle dived after the agent's pistol. Just as he scooped it up, the door to the control compartment flew open. Knight jammed his gun into Borzec's ribs before the Prussian could aim.

Borzec brought up one knee for a vicious blow to throw Knight off balance. But Knight jumped clear, whacked his gun against the other man's elbow. Borzec's fingers spasmodically flew open, and the half-lifted Mannlicher clattered to the floor.

Chekal twisted around in his seat. As he saw Knight, he flung one hand inside his coat. Knight hurriedly swerved his gun.

"Keep your hands on the wheel!" he rasped.

The gaunt pilot cowered down in his

seat, then one lean hand flicked out to the instrument board. The shriek of the siren filled the hurtling plane. Then Borzec suddenly launched himself at Knight. Knight hastily sidestepped, and Borzec struck the door.

A gun blasted from somewhere aft but the bullet only spattered itself against the breech of the rocket-gun. There stood Vornoff, a smoking pistol in his hand. Knight fired swiftly, and Vornoff crumpled.

Doyle was shielding Benita and trying to keep Borzec cornered. Knight crashed a left hook to the side of the Russian's jaw and leaped across to the girl. Before Borzec could recover his balance, Knight had swung Benita into the control compartment.

"Doyle!" he shouted. "Get in here—keep Chekal covered!"

TWO mechanics now charged forward from the third compartment. Doyle blasted one of them with a quick shot, sprang in beside Knight. As he did so, Chekal gave the control wheel a jerk, and the violent swerve of the Macchi almost hurled Knight through the doorway. He caught at the frame, pulled himself back. He was yanking at the door when Borzec plunged through the half-closed entry.

Kursk had clambered to his feet during the battle. With three mechanics close behind him, he lurched toward the pilots' compartment. Knight made a lightning decision. There being no time to hurl Borzec out and close the door, he drove his gun into the Russian's solar plexus. As Borzec doubled over, he jerked the door shut. The lock snapped just as Kursk and the others landed against the panels.

The Macchi was now nosed down in a terrific power glide. Knight whirled. Chekal had let go the controls, was struggling to get Doyle's gun.

Knight flung a frantic glance at the compartment door. Kursk and the others were hurling themselves against it, and through the round glass window he saw more men come dashing forward. He jumped past Borzec, clutched at a numbered valve. Chekal gave a wild screech.

"Madman! You're cutting off the air

in this compartment."

Knight spun the valve shut, caught the trembling control-wheel, and steadied the diving Macchi. He saw Benita grip the edge of the instrument board to keep from falling. Doyle had dragged Chekal half-way out of his seat, and the gaunt pilot was kicking wildly to hook his feet on the cross-bar.

Another furious onslaught shook the control cabin door. Knight's desperate eyes flashed to the cooler by-pass valve. With shaking fingers he started to whirl it shut. If that door burst open now it meant they would cook to death!

The instrument panel swam before his eyes. With five of them packed in that cramped space, the air was going swiftly. Clawing fingers raked over his hand. He saw Borzec's face, distorted, ugly with terror. Then the by-pass valve closed tightly, and the frightful heat of the uncooled air poured into the other compartments.

A scream of mortal agony rang from behind the door. Half-fainting, Knight managed to turn in his seat. Through the thick glass port in the door he looked into an inferno. Heat waves were shimmering in the eery blue light, and staggering figures were slumping to the floor. A red and awful face was pressed for a second against the round glass window. Kursk's brutal eyes bulged at them like some terrible thing in a nightmare. Then his tortured visage vanished from sight.

There were suddenly no more screams, and Knight knew that only the dead rode behind them.

Through a swirling haze he now saw blazing lights ahead. The Macchi's hurtling plunge had taken it out of the stratosphere and down to a bright-lit world. A city lay ahead, and beyond it a dark mass of water. Searchlights pierced the sky, planes were swarming in the air—he now knew that Benita's dropped note had been found.

With his last bit of strength, Knight turned the valve that unsealed the bow compartment. A cold, sharp blast blew upon his face. He sucked the air deeply into his lungs, felt his reeling senses steady.

His fingers plucked at the throttles, and the giant ship lost its terrific speed.

The lights of the city swept underneath. It was Norfolk . . . and ahead in Hampton Roads a Navy carrier was swinging at anchor . . .

WITH a snarl of fury, Borzec pulled himself free as Doyle sought to hold him back. As the Macchi leveled off above the dark waters, he clawed frenziedly at the throttles. One engine roared, and the huge plane slued around as its mighty hull touched the waves. There was a grinding sound, and the Macchi bounced from the water. But then it struck again with a jolting crash and shuddered to a stop.

Knight cut the switches, lunged out of his seat. Borzec whirled, flung open the door to the aft compartments. Kursk's body tumbled down, but Borzec leaped over it and raced through the corpse-strewn cabin.

Navy gigs and barges were speeding across the water. Knight unlocked the door at the side of the compartment, lifted Benita out as the first boat drew alongside. A two-striper with a drawn .45 stared as he saw the girl . . .

Minutes later, after Knight's hasty explanation, the three of them lay in the boat at a distance of two hundred yards and watched the now fast-sinking Macchi. A dozen searchlights were trained on the monster's hulk from slowly circling destroyers and the carrier beyond.

"Chekal was dead," Doyle muttered. "But Borzec—what's happened to him?"

The two-striper looked at him curiously.

"Whoever this Borzec is, he'll never get away now."

"You're right," said Knight. "He's trapped."

Benita shivered, and he put his arm about her. The Macchi settled lower, then in the glare of the lights which played upon it a dark-colored vapor arose. It swelled quickly, spread into a bright green cloud. For more than a minute it rested upon the water. And when it slowly dissolved, the giant plane was gone.

"Lord!" whispered Doyle. "Borzec played the game like a captain—went down with his ship!"

All Questions Answered

(Continued from page 36)

your Canadian map makers to be more specific, because I used a Canadian map when I wrote the story—and found it marked **Island**. Thanks for the tip just the same!

B. Pitray, Detroit, Mich.:—The plane you inquire about and of which you sent a clipping is, I believe, the old Curtiss F-9C-2 "Sparrowhawk," or at least an early version of it. But it certainly did not do 300 m.p.h. in 1931. The statement that "it took off in less than 400 feet and climbed like a rocket" is the tip-off on how much that newspaper editor knew about the plane. It certainly ought to take off in much less distance than that.

Mr. Armand Beaulin, Manchester, N. H.:—You certainly must have read the article on the government requests for Navy pilots very closely. Write to Lt. W. C. Allison, Naval Reserve Aviation, Floyd Bennett Field, Brooklyn, N. Y., for details on the short-service commissions that were being offered.

Jack O'Brien, Los Angeles:—The insignia of the little bomb-headed man riding astride a torpedo is that of Torpedo Squadron No. 1, U.S. Naval Air Service.

Roland Fisher, Denver:—We do not know what the planes are you speak of in your letter, and we have no idea why

the National Guard outfit there does not have better equipment. Why not write to your Congressman about it? When we make those statements they call us "squawkers" and we are accused of "always belittlin'." Maybe you can do something about it.

Richard Sheak, North Ridgeville, Ohio:—Why not write for all that detailed information to the Granville, Miller and DeLackner firm, Springfield, Mass., and get it straight? I do not have all the details at hand.

Charles Boheimer, Fulton, N. Y.:—Very sorry, but we can't send out pictures of planes like that. We would be

swamped with orders if we ever started that sort of thing. You can get most of the long list you inquired about by cutting the pictures out of this magazine. We feel that we are more than generous about publishing pictures of modern planes.

Warren G. Honecker, Sewickley, Pa.:—The Navy Northrop fighter is said to have a terminal velocity speed of 450, the T.V. of the Curtiss Helldiver has never been announced; and in addition, you must remember that the Helldiver has undergone so many changes and improvements in the last few years that it is virtually impossible for us on the outside to keep up with these changes.

Bruce Dentsch, South Bend, Indiana:—Cruising speed seems to have several explanations. On the big airliners it seems to mean speed at 60 per cent of available power. On other planes the term three-quarter throttle seems to be the accepted rule, while on others, it is the speed at which the most miles per gallon is obtained. A torque tube is usually a hollow light metal tube which is used through the wing frame to operate the ailerons instead of using the usual flexible cable over pulleys. In the Cairns, for instance (a low-wing monoplane) you can see how much easier it is to move the ailerons with a single tubular rod than all complicated business of cables and pulleys. Some call the system "push-pull."

James MacWalter, Astley, Manchester, England:—There is a formula known to most anti-aircraft units whereby the height of a plane can be computed by figuring its proportional length through a special instrument, but it is too slow for modern usage and there are many other and more accurate systems in vogue. When you come to New York drop in and see us, we liked your letter very much.

Ralph C. Glaze, Miles, Texas:—The chemicals used in smoke-screen work and for sky writing differ greatly wherever used, but in general they are composed of titanium tetrachloride and white phosphorus. The wide uses of these smoke systems, particularly in sky advertising and in obtaining colored effects at air pageants, gives the manufacturers a wide range in their formulae.

Paul Paulson, Randolph, Mass.:—We pay one dollar apiece for all aviation jokes we use. I frankly do not know much about these new light-weight motors for models, but I do know that the one you mentioned is said to rate in the okay class.

Levin Leyden, Philadelphia:—We again explain that we cannot take time to answer lists of *contest* questions. But all the questions you ask can be answered by any of the modern aeronautical volumes.

Stephen Stauro, Jamaica Plain, Mass.:—Sorry, but there are no aircraft manufacturing companies in Boston. But the

Sikorsky plant is at Bridgeport, Conn., and the Vought company plant will be found at East Hartford, Conn., also there is the Cairns Development Corporation at Naugatuck, Conn. That's the best we can do for you.

L. Wilfred, North Island, New Zealand:—Many thanks for the clipping on Squadron Leader McGregor. We knew much about him before and of course had learned of his death with sincere regret. Also many thanks for your kind words concerning our magazine.

F. S. Talbot, High Wycombe, England:—The U. S. Air Service is experimenting with a Kellett Autogiro—practically the same type as that recently exhibited in England. The Kellett firm has purchased manufacturing rights to the Cierva Autogiro. They use the American Jacobs engine of 225 h.p. The S.E.5-a and the Sopwith Dolphin used the 200 h.p. Hispano-Suiza engine. Many thanks for your photographs taken at the Hendon air display.

J. L. Sumrall, Jr., Laurel, Miss.:—We have tried to uncover all the freak twists in the Flea, and you have perhaps read by now the latest findings as explained in our light plane department. Frankly, we still like it as an ultralight plane, which is what it is—nothing more. The Lockheed Orion has a top speed of 225 m.p.h. It is used by the Wyoming Air Service today and has a load capacity of 2,200 lbs. and a cruising range at $\frac{3}{4}$ throttle of 770 miles. I believe it was first manufactured in 1931. I have no record of the first all-metal military machine produced in this country; for there are few real all-metal jobs. Most of them have fabric or a wooden spar in them somewhere. But I believe there were several experimental types as far back as 1920.

E. Dougherty, Gunnedah, Australia:—The speed of a plane in straight flight can be increased materially by changing the pitch of the prop, just as the climb of the machine can be improved by increasing the pitch. In level flight, the pitch is decreased so that the prop moves faster and does not need to exert such a pull. In a twin-engine plane, the propellers usually turn in the same direction, and the fin is offset to counteract any torque that might be experienced.

George Emerson, Canterbury, New Zealand:—Sorry, but you can't get into the U. S. Army Air Corps—unless you are an American citizen. Likewise, you cannot get into the R.A.F. in Britain unless you are a British subject with both parents born somewhere in the British Empire. Air Services are like that today.

Eric Rose, Launceston, Tasmania:—Thanks for your long letter and the details of the show you saw out there. We are always glad to hear from you lads so far away.

Daniel Galagher, Pricedale:—Most of the Fokker D-7's carried the later-type cross, not the Maltese cross; but a few

of the earlier models have been photographed with the Maltese cross. During the war, the French rudders were the same as they are today, with the blue stripe nearest to the fin and the red on the trailing edge. The British used this same arrangement also up until about 1928 when they changed; and now the British rudder is marked red, white and blue with the blue stripe on the end or trailing edge of the rudder.

Joe Thomas, Bronx, N. Y.:—I'm afraid I'm as ignorant as you on this rocket business, but the best I can make out of it is that there is a certain amount of air in the so-called stratosphere and that it is sufficient to give propulsion to rockets and yet not offer the amount of resistance the same rocket would get at a lower altitude. The situation in dive-testing, as you call it, requires swallowing or opening, the mouth so that the same air pressure is "registered" on both sides of the ear drums.

Farmer Blake, Jersey City:—I know of no such Fokker seaplane as you mention that does 340 m.p.h.; and I know of no plane in the world, outside of one or two special racing ships, that can equal such a speed. It is not likely that there is any seaplane in Japan with such a performance. I'm afraid your uncle has made a mistake.

Dick McClure, Mt. View, California:—The plans you refer to were drawn from blueprints of the Waco-D supplied by the Waco firm, so I see no reason why they should be wrong. The late Sopwith Snipe (154 with the A.B.C. radial) was the fastest plane on the Western Front. Yes, the S.E.5 was a far better plane than the Spad. Your other questions I cannot answer—if your parents do not want you to fly.

Paul T. Barrows, Brooklyn:—Many thanks for your drawing of the Siemens & Halske engine. I have studied it closely and believe you have hit it. I wish we had a sketch suitable for publishing, for there are many readers who would be interested in it. I am returning it to you. Thanks.

Bradley Vosper, Goliad, Texas:—We can't make out what machine you are referring to. The Snipe and the Salamander both had two sets of interplane struts, and the only explanation we can think of is that the picture of the Camel got mixed up with the caption intended for a Snipe. Thanks for the kind words on the Kerry Keen stories.

Leonard T. Hirst, Herne Bay, Auckland, New Zealand:—Yes, we know of the gallant attempt of the three Australian airmen to fly to Honolulu. Some day we will try to include it in a series on memorable flights. Thanks for your interest in our pages.

Jack Kaplan, New York City:—There are no accurate records of the plane first designed by Fokker during the war period, but many of his sport planes were put into use as war planes

as soon as hostilities began. From his book *Flying Dutchman*, one gets the impression that his first military order was for twenty-four single-seat sport planes for the use by the German Army; and we must presume that the E-1 monoplane was his first real military job, although none was fitted with machine guns until early in 1915.

Howard Machris, San Francisco:—Your eyes have to pass a very strict examination before you can get into the Army Air Service as a pilot. The Lockheed Vega-5C has a top speed of 195 m.p.h.

Richard Cottew, Queensland, Australia:—You can buy machine guns, I suppose, if you get a police permit. The trick is to get the permit. Yes, there was a Beardmore W.B.3. plane during the war that had a form of retractable landing gear and folding wings. The *Southern Cross* was a Fokker F-VII-3M type. Several American firms built military planes during the latter months of the war, including Curtiss. But outside of a few D.H. 4s built here, no real American planes reached the front. No, there is no such plane as the Gordon. I invented that name for use in one of my stories.

Thomas E. Russell, Canton, Ohio:—There was a Boeing F4B-3, and the only apparent difference between it and the F4B-4 is to be noticed in the head rest hump behind the pilot. In the "3" it

slopes down more gradually and the fin seems to be somewhat smaller. They both have the same motors and apparently similar performance.

Wendell James, Sharon, Pa.:—The Boeing P-29 has not as yet been accepted as a service ship, so it does not rate in the speed list. *The Spirit of St. Louis* used a Wright Whirlwind radial.

William B. Bretuall, Denver:—I do not believe any official report was ever made of the Darius-Girenas crash in Germany. I know there were statements made that the plane was actually shot down and that there were marks that appeared to be bullet holes, but no report of the actual findings was ever published. I'm sorry, but I have no idea what the photograph you sent me might be. There is a possibility that it is the main spot of a compass-swinging platform or a general entrance for the fuel tanks which are sunken into the ground.

Charles E. Hoskin, Taraki, New Zealand:—Squadron Leader McGregor had seven victories during the war. The case of the crash of the Boeing bomber is still something of a mystery, but there is no doubt that it was taken off with the controls locked. How or why, we can't tell. Apparently there was no time to unlock them before the crash. The synchronization gear does not affect the speed of a gun much, it only controls the firing. A new British gun gear

has been devised to take up the matter of high speed engines by means of a governor arrangement. The starter you refer to was an inertia starter, in which a main spring is wound by hand, then suddenly released when connected to the crank-shaft of the motor. Photographs clipped from magazines are of no use to us unless they come from plates printed on very fine and smooth paper, and only in an extreme emergency would we attempt to reproduce them.

Richard C. Millet, Redding, Conn.:—Some D.H.4s had two-blade and some had four-blade props. The pilot had one fixed gun, and in some instances the observer had two movable Lewis guns.

Gladys Troxell, Akron, Ohio:—You seem to have most of the qualifications for a hostess. Why not write to the Employment Manager of American Airlines, 4848 W. 63rd. Street, Chicago?

Robert Dean, Festus, Mo.:—What do you mean by a Curtiss-Keystone trimotored bomber? I have no record of that plane. Aeronautical engineers are very acceptable in the services.

Henry Egg, Hamden, Conn.:—According to aeronautical data, three-fifths of the lift of a wing is obtained through the camber creating a vacuum, above the wing, while the remaining two-fifths is obtained by thrusting the tilted lower side against the air.

—By ARCH WHITEHOUSE

Riddle of the Rocket

(Continued from page 24)

under the black body.

"It won't be either for the guys who try to pick it up later," grinned Keen through his mask. "Come on, we're cutting it pretty fine. I see you put on those four small bombs, too. We'll need them, I'm afraid."

They clambered into their black parachute harnesses, checked their automatics; then Keen climbed into the cockpit while Barney doused the underground hangar lights and set the machinery in motion which would open the great doors. Keen started the big Avia motor and let her warm a trifle more while the big doors spread apart. Then he let her rumble out, completely muffled by the Skoda silencers.

The Black Bullet was soon surging across the easy swells still muffled. Then they cut clear of a mooring buoy, opened her up, and took off in the half-light of a first quarter moon.

Owing to the large torpedo, Keen could not retract the pontoons and they had to climb at somewhat reduced speed. Still they were at 4,000 in no time. Keen checked the clock and his wrist watch and continued to climb while Barney set out his armament store in the rear.

Keen watched his clock and carried out every move he had carefully planned the night before. Both watched eagerly for a trace of what they had come to intercept.

Suddenly Barney cried: "Here she comes!"

Keen stared out, saw a rocket-like form again approaching from far out to sea. It was coming from exactly the same direction. He turned the Black Bullet, opened the mufflers to get every ounce of power out of the Avia, and nosed down directly toward the hurtling object.

Their coup had to be timed perfectly.

"Now!" screamed Barney.

Keen pressed every trigger gear in his office. The Darns and Chatelleraults screamed, poured their withering wrath into the rocket.

There was a sudden flash. The rocket suddenly appeared to go haywire. It zig-zagged about, then swooped upward and seemed to be trying to sink its big nose into the whirling blades of the Black Bullet's prop. Keen just managed to yank the amphibian clear in time, for the rocket did a full loop, belched smoke, then continued on toward the water in a tremendous dive. She hit with a great chug and threw up a massive plume of water.

Without waiting to see what had really happened, Keen whipped the Black Bullet around and headed hell for leather toward Black Point. He gave the Avia all she had for several minutes, then suddenly slipped in the Skodas again and turned to Barney.

As though they had rehearsed the

move a dozen times they changed places, Barney taking over the controls and holding the Black Bullet on Black Point. Keen huddled over a bomb sight set outside the cockpit cowl. Once they were over the outer tip of the Point he jerked the toggle handle and let their strange galvanized device slide away. They watched it start out. Suddenly it turned slightly and automatically steered itself toward a patch of woodland.

"It works!" gasped Barney.

"It was supposed to," replied Keen grimly. "There it goes toward that field beyond the wood. Get me over there."

Barney stopped, pondered on the strange little box with its three steel fingers. He knew the fingers had been attached to smooth copper cables that connected with the crude rudder and elevators of the torpedo device Keen had devised on such short notice. But his unimaginative mind could not visualize what was making the torpedo select such a definite path after leaving the crutch under the fuselage.

But Keen was acting fast now. He was clambering out of the cockpit and making his way to the wing root while Barney guided the Black Bullet toward the patch of open ground just beyond the woodland. The silenced Avia purred softly as Barney followed the road that wound around the wood and rounded off the northern side of the field.

"Now!" signalled Keen, with a glance

through the cockpit hatch at Barney.

The Mick drew the stick back slowly, put the Bullet into a steep climb. With a cheery wave Keen dived headlong over the trailing edge and reached for his 'chute ring once he was well clear of the tail. He drew it out slowly and evenly, waited for the jerk. He twisted twice, then came a thunderclap of black silk above him. Almost at the same instant there was a low muffled thud somewhere below.

Keen steadied his 'chute pulled away his scarlet mask, and stared down. In the center of the open field gushed a spurt of flame and then a bulbous cloud of white smoke where their rocket had hit. He smiled, tried to see beyond the wide ring of light that was given out by the burning phosphorous, hoping to get a full idea of what he might expect when he got down.

He reached for his automatic, then eased the shrouds on one side to slip a little closer to the field. He wanted to land inside, if possible.

Then to his amazement—and horror—a new menace swept into the picture. Keen instinctively raised his gun, fired. But it was like aiming a pop-gun against a battery of howitzers.

"Barney!" Keen cried, then clapped his hand over his mouth, amazed at the sound of his own voice. He wanted to cry out again, but instead he uttered a most unearthly laugh. The Griffon was trapped by the same snare he had devised for a man who should have been somewhere down in the Indian Ocean where monsoons blow!

A Dutch Fokker was plunging upon him! He looked again, waited. This was the end for Kerry Keen. Two blinking eyes flashed out of the mist and he waited for the thud of lead that would blast out his life. He could hear the leaden horns zipping past him, plucking at his black coverall. He wondered what they would say when they found his lifeless body in the black parachute harness. But would they ever find him? Or would Barney, true to his trust, speed away and forever hide the secret of the Griffon?

He was near the ground now, less than a thousand feet to go. Would those swine in that Fokker ever get their gun eyes on him? The roar of the Kestrel was unmistakable now. The thud of the concussion from the guns pounded in his ears. Four seconds of terrific agony seemed like an hour.

The gray Fokker came on and then before it could complete its ghastly task, a black nemesis slammed out of the east with a screaming of wings and put a long wickedly-accurate burst smack into the Fokker.

Keen reached up quickly, snatched his shrouds, pulled. The big black 'chute slipped and just cleared the outer wing-tip of the side-slipping Fokker. He twisted in his harness, stared into the gun muzzle of the observer, who, with one last effort to complete his mission, was drawing a careful bead on the swaying black figure.

Keen closed his eyes, instinctively drew in his stomach. Then there was a rattle of bullets and he opened his eyes to see the Black Bullet slamming at the

Fokker. The observer was nowhere to be seen. The burst had caught a tank somewhere and the gray Fokker was rolling over with flames clawing at its tail from a great gash near the wing root.

"Good old Barney," breathed Keen, drawing his legs up for the landing.

DURING the last few hundred feet, Keen's mind worked like a high speed loom, weaving these strange events together. He asked himself a dozen questions, got no answers that really satisfied.

Where had this second Fokker come from? How did they know that he would be over Black Point at this hour? Would the trap still be open down below where the torpedo device still burned in the open field?

Before Keen could ponder further he hit the ground with a thud and rolled over, tangled in his shrouds. He lay still, then carefully slipped out of the encumbering harness and reached for his gun which had been fastened to him with a shoulder lanyard.

The burning torpedo device still emitted a great cloud of white smoke together with flame caused by the burning phosphorus. Keen eased around in the shadows, then saw that two men were working furiously in an effort to douse the fire with chemical extinguishers.

Adjusting his scarlet mask, he crawled as near to the burning torpedo as he could and still remain in the shadows. He listened, sensed at once that they were vainly attempting to retrieve something from the torpedo—just as he had known they would do. He could hear their anxious remarks.

One was a blond haired man, tall and heavy, who spoke with an accent. The other was a slim, dark, nattily-dressed man who reminded one, somehow, of a dagger.

"I tell you it's *not* one of our rockets," the slim dark man was shouting. "This is a gag of some sort. Didn't you see the Fokker go down. There's something going on . . . somewhere. That Griffon guy is in this somewhere."

The heavy blond man continued to use the portable extinguisher and vainly attempt to get near the torpedo. "But it iss, I tell you," he raged. "It iss vun—a new vun. They must be here."

"They'd better be, van Aller," the neat dagger-like man snarled, calmly lighting a gold-tipped cigarette. "There won't be any delivery tonight unless there is."

"But the *Monsoon* is up—waiting for the news," the big blond man pleaded.

"Maybe so, and the ice had better be delivered tonight, or that *Monsoon* does not go out. We're only risking our necks now. I tell you this Griffon guy is onto us and the quicker we get out of here the better. I don't like that business up there. Someone got Frolich in the Fokker."

"What vass he shooting at? What vass he shooting at?" the man named van Aller burst out, drawing back from the flames.

"That's what I want to know. I couldn't see anything, until that crazy black bus slammed in and got him. He must have been nuts, shooting at nothing. And now, what are you going to do, van Aller? You've got the *Monsoon* up there on a night test; but where's the ice?"

"It must be in there. It must be in there," the big blond wailed staring at the blaze.

"If it is, there's no use looking for it now. They'll never stand phosphorus heat."

"But the *Monsoons* must start out tomorrow early if we are to make Batavia in time to cover the forfeit," van Aller moaned.

"If you think that is one of your old man's rockets—that piece of junk," the dagger man smirked, "you must be crazy. It's nothing like his outfit."

"But . . . but it came in perfectly when we put the control beam on it," van Aller pointed out. "How could that be? It came on under full control."

The dagger man rubbed his chin reflectively, pursed his lips. Keen knew that point had them all guessing. He was picking up plenty of hot information, but he still wanted more.

"I don't know, either," the dagger man now broke in. "But we haven't the ice, so what?"

"You've been paid plenty so far. We can get the rest to you as soon as the *Monsoons* are delivered to Batavia."

"Half a million dollars worth of the best flying boat equipment in the world," stormed the other, "and we only got about \$300,000 worth of ice, even if we can get rid of it. Where do you think we come off?"

"I know . . . I know," pleaded the big blond Dutchman, "but we've done our best. Someone is . . . what you say . . . wise to us, eh? We must move quick, Blaine. We are taking long chances. You must let the second *Monsoon* out, or we'll all be trapped. We should let her through with the understanding that as soon as they get to Batavia they make arrangements to get the rest of the glass through to us—or."

Blaine, the dagger man, reflected a minute, then made a sudden decision. He looked around carefully at first, then turned back to van Aller.

"Okay! The *Monsoon* goes through to the *Waatlund* on schedule. But you stay here, van Aller, until the rest of the ice comes through. Get it? If it fails to get here on time, We'll put in the hooks, Milford will be tipped off—on who picked the special test crews for the *Monsoons*."

"But," gagged van Aller, his lower lip dropping, "they will need me aboard the *Waatlund* to tune the *Monsoons* for the trip. There's the changes to be made on the way. Motor numbers changed, new plates everywhere, on mags, radio sets and manufacturer's type plates."

"Yeh? Well, any guy with a hammer and a cold chisel can do that," smiled Blaine knowingly. "You're staying here, van Aller—just in case things don't work out just right."

"I can do nothing," shouted van Aller, throwing out his big hands. "You are the boss, I guess. There's nothing else to do. You will signal the *Monsoon* then?"

"Come on," snapped the big dark man. "Let's buzz."

Suddenly, Keen saw them stiffen. He had been quietly flipping a small flashlight on and off. Now he twisted in a new lens and the beam was flashing a bright green. But Blaine and van Aller had not caught the light; they were listening to an eerie wail somewhere above them. They stood still, tried to peer into the night sky. They cupped their hands around their eyes, listened intently.

"There it is again!" screamed van Aller like an hysterical woman. "The same thing—black and it wails. That's what poor Frolich was trying to get. It's a . . . ghost plane! We're caught!"

"Shut up, you Dutch fool!" snarled Blaine. "Come on, let's beat it to the car and get the *Monsoon* away. Come on, van Aller!"

THE move caught Keen off guard; for they now turned and started toward him. Blaine had caught the final flash of the green light, and now he stumbled directly into Keen.

"Why you—" he started to say. But Keen had them all covered.

"Who the hell is that?" demanded the big man.

"And where is the *Waatlund*, gentlemen?" demanded Keen in his disguised voice.

"Who the devil are you, and where did you come from?" demanded Blaine.

"I'm known to my friends—and one or two enemies—as the Griffon. I'm sure you've heard of me," Keen replied, flashing the green light again. Overhead the Black Bullet droned in lazy circles.

"The Griffon!" screamed van Aller. "The Griffon! I knew it! I was warned to look out for him by that man Lang."

"Shut up, van Aller," yelled Blaine.

"Ah, yes, the indomitable Drury Lang," taunted Keen. "And where is Mr. Lang, may I ask? The quicker you answer, the sooner we can all get going. I'm sure you appreciate that fact."

"Lang's where you, or anyone else, will never get him," replied Blaine. "Just a dumb, nosey Secret Service man. He was easy. You'll be easier, Griffon, or whatever your name is."

"So you're getting the second *Monsoon* out tonight?" Keen went on in his Griffon rôle. "Mr. Lang wouldn't be aboard, would he?"

"Yes, he would!" almost screamed van Aller.

Blaine wheeled sharply, almost threw a punch at the Dutchman. But he controlled himself just in time, as the Griffon made a gesture that indicated that he would shoot on any pretext. Blaine scowled and stared up, trying to locate the eerie wailing that came from the Black Bullet.

"Thanks, van Aller," Keen taunted. "I presume your father, Waalart Van Aller, of the Dutch East Indies Air Transport Company, is aboard the *Waatlund* expecting you?"

"No, he won't be there," snapped Blaine.

"Thanks," taunted Keen again. "So old man van Aller is aboard the *Waatlund*. Now where is the *Waatlund*?"

"You may have been smart enough to find out about Lang and Van Aller, but you won't find out where the *Waatlund* is," Blaine snarled, glancing across at the Dutchman with a warning in his eye.

"You're in a tight spot, van Aller," Keen warned. "They are going to hold you here until the rest of the 'ice', as Mr. Blaine so blithely calls Amsterdam rocks, is delivered. If those two *Monsoons* get clear, we can pick you up at any time, and there's been too many men killed to get off lightly. They may want you to sit in the big chair—just to make an example of someone, you know."

Poor van Aller stared from Blaine to the man in the scarlet mask, unable to speak or to even think straight.

"You may get the two *Monsoons* out and all the way to Java to cover your forfeit on the Royal Dutch government Batavia-to-Amsterdam air route contract, but you'll never get out to enjoy it," Keen continued.

"What can I do?" the lippy Dutchman pleaded.

"Tell me where the *Waatlund* lies and I'll put you aboard her so that you can make your getaway—but not with the *Monsoons*. They go back to the Milford ramp undamaged. That goes for Lang, too."

"But the *Waatlund* is out to sea about two hundred miles—"

"Damn you, van Aller, shut up!" screamed Blaine.

"Where?" snapped Keen. "Come on! Talk fast, if you want to get out of this the easy way."

"Two hundred miles out to sea, no matter how you figure it," van Aller gagged, fingering his lips like a haunted man.

"Two hundred miles from the Milford plant?" probed Keen.

"Two hundred miles from land," van Aller continued staring into space.

"What is she, a depot ship?"

"A copy of the German *West*—" van Aller tried to explain. But he never finished.

Crack!

A gun barked somewhere and van Aller toppled forward on his face.

Keen tried to figure out what had happened, but Blaine had been too fast for him. He had dropped van Aller while Keen was intent on getting the words from the Dutchman.

The dark man's gun spat again, clipped the air-pressure pad from Keen's helmet.

"Two hundred miles from shore, anywhere!" screamed van Aller rolling over on his back. "Two hundred miles, anywhere from shore. Like *West*—"

Keen tried to hold Blaine off, but the dagger-like man had now poured three shots directly into van Aller's head.

Keen fired again, blew the gun out of Blaine's hand with a shot. The dagger man stood holding his bloody hand,

grinning maliciously.

"Not much information there, eh, Griffon?" he smirked.

"No, but enough. 'Two hundred miles from shore.' That's enough." Then Keen flashed the colored flashlight skyward again and waited, holding Blaine off.

For several seconds the two men stood there staring each other out. Blaine was plainly puzzled as to what would happen next. Then something swished past his head and he ducked as he would from the hiss of a wasp.

"Don't worry," smiled Keen, "it won't hurt you. Just my little idea of making a quick get-away."

Blaine was staring about trying to figure out what was going on. Above him wailed the wings of the circling Black Bullet and then that strange hiss came again and he stepped back, trying to determine what it was. But before he could come to any decision, Keen made a sudden snatch at something, gave the light a quick green flash, and—as far as Blaine could tell—simply disappeared into the swirl of smoke which still rose from the twisted debris of the torpedo.

"Damn you!" snarled Blaine, whipping around.

"Good-bye, Mr. Blaine," called a voice from somewhere in the darkness above. "I'll look for a ship masquerading as the German Luft Hansa depot ship, the *Westfalen*—two hundred miles from shore. Good night, Blaine."

But the frustrated Blaine whipped up his fallen gun, fired three times into the darkness, wondering by what means of magic the Griffon was able to escape so assuredly. He could not know, of course, that Keen had signed for Barney to drop their pick-up cable which had a weight on the end, and which moved in an easy ten-foot circle when lowered from an altitude of a few hundred feet while the Black Bullet circled lazily above.

Blaine finally threw the gun away and ran, still holding his wounded hand, toward a light truck which had been hidden in the bushes nearby. He leaped inside the truck, drove away for about three miles inland, then stopped and yanked open the cover of a radio transmitting panel. He barked quickly into the mike, got an answer, then gave an order for someone to proceed out to sea at once. Then he drove away into the darkness, cursing the man known as the Griffon.

KEEN clambered over the wing fillet and into the rear cockpit. Without much ado, he ordered Barney to head for the Milford plant farther down the Connecticut shore.

"When you get there," he ordered, "turn due east out to sea while I figure out something."

"What were you doing all that time," demanded Barney. "Taking fingerprints?"

"Shut up. They've got old Lang aboard the second *Monsoon*, so you can see where we fit in. This is a pip, this time. The plane is on its way out to sea by now, to join the other. Poor old Lang! A nice way of getting rid of him.

Maybe they'll even hold him as a hostage."

Then Keen snatched out a Geodetic Survey chart, put a pair of dividers on the scale, and pinched them so that they marked the 200-mile measurement. Then he put one end of the dividers on Milford and marked the distance directly out to sea. He tried the same thing from a point off Falmouth on Cape Cod, which was the nearest point of land to the north, and checked that point on the arc he had drawn out from Milford. Then taking it from a point between Cape May and Barnegat Bay on the New Jersey coast, which was the nearest point of land to the south, Keen reached a cross-bearing that indicated that a ship lying 200 miles from shore must be somewhere in the vicinity of 38:42 N. by 70:58 W. This point was the only one that was exactly 200 miles from any point of the shore as well as from the Milford plant.

It had to be right.

All they had to look for now was a Dutch vessel masquerading as the German *Westfalen*, two Milford *Monsoon* flying boats worth about half a million dollars—and Drury Lang.

"Get out of your 'chute," ordered Keen, once he had completed his chart. "And your gun—I may need that, too."

"What the devil went on down there, anyway?" again demanded the perplexed Barney as he unsnapped the clasps of his 'chute.

"Things worked out very well, Barney," Keen explained into his Gosport headset. "A gentleman by the name of Waalart van Aller, a Dutch financier with a touch of Captain Cook in his makeup, decided to take a long chance on a big aviation line contract. It so happened that a man by the same name, evidently his son, was a trusted electrical engineer in the Milford aircraft factory."

"You can't beat the Dutch," grinned Barney.

"Be that as it may, our friend Waalart van Aller, bit off too big a chunk when he placed a large forfeit to produce at least two flying boats capable of regular service for the Royal Dutch government between Amsterdam and Batavia in the Dutch East Indies. This is a very important link of communication between Holland and her distant colony and there is a lot of money in it for the company that obtains the contract."

"But what was he doing trying to steal the *Monsoons*? I still can't get that angle."

"They were the only machines available to do the job. Van Aller tried to get the Fokker interests in Holland to build the planes for him, but they refused, mainly on the ground that they were not equipped to build flying boats of that size."

"So they came over and tried to swipe two *Monsoons*?"

"Well, hardly. They were prepared to pay for them—at least pay something for them—if they could get them. So they arranged for a gang to get inside the factory when the two planes were finished and ready for their test

flights. Young van Aller was the brains of the business, of course."

"But the rocket racket?"

"That was the strange tie-up. They used that rocket idea to smuggle diamonds into the country to pay the gang for the *Monsoons*. You see, I learned from the foreign business almanacs that old van Aller had a neat tie-up in the diamond industry in Amsterdam, and he was able to get valuable stones cheap. If he could get a reasonable amount of them into this country without paying the duty on them, he could pay the gang a reasonable price for the ships. The trick was to get them in."

"So he had a rocket," grinned Barney.

"And what a rocket!" added Keen. "They first got a vessel which is fixed up to look like the German Luft Hansa depot ship, and by some means devised a rocket which could be directed by radio—which is a good idea, too. Old van Aller then sent the stones in small lots, and young van Aller waited at the other end with some sort of electrical directing device and brought it in. The rocket was fixed up to hit and flare up for a few seconds to give the impression that it was a meteor and thus put the inhabitants off the scent. Then they would open the rocket, take out the metal box of diamonds, and retrieve the radio homing device fitted inside for use again later."

"So that was what that guy in the Fokker was carrying back when we stopped him," mused Barney. "But that seems sappy. If they could get a Fokker back and forth, somehow, why didn't they let the guy in the Fokker take the diamonds?"

"Any one but old van Aller would have done that. But he is a strange man. First off, he did not trust anyone but himself and his son. Secondly, this rocket is his own invention and he's childishly confident in it. As he was 'going in off the deep end,' so to speak, he decided to complete the exchange on his own hook and use his rockets."

"Which was the one mistake he made, eh?" said Barney.

"You mean we scotched his idea by swiping his homing device, putting it into a rocket of our own, and releasing it on gravity to trap them. But we took a long chance, too. I only *hoped* we had pinched their homing device. I was not certain, I had to take that chance."

"But think of all those rocks at the bottom of the sound," said Barney.

"I have, and I noted them particularly. You Barney, my boy, are going to take a short course in diving in a day or two and get them up. I checked the position. They are on Saybrook Ledge, only a matter of fourteen or fifteen feet down."

"Leave it to me, I'll get 'em," grinned the Mick.

THEY continued the wild flight for nearly half an hour more, checking their position and completing their amazing plans. Keen knew he had more than a job on his hands. For one thing he had to save Drury Lang and still retain his identity, which was a job in itself. Then he had to outwit Waalart

van Aller and recapture the two *Monsoon* flying boats and still keep the Black Bullet for his own special use.

Even Keen wondered how he would get away with it, but like those of his tribe, he made plans as far as he could figure and trusted to his own ingenuity to complete the job successfully. He sat back and pondered on what was ahead, then suddenly decided that as Lang was mixed up in it somewhere, he might as well be put to work as soon as the situation arose. But Lang would have to be handled in such a manner that Keen could maintain his disguise.

He slipped into Barney's parachute and belted on two guns. Then he fitted his microphone speaker which would assist him in completely disguising his voice. He slipped off his shoes, put on a pair of rubber-soled sneakers, finally made certain that his scarlet mask fitted perfectly. His helmet and goggles completed the disguise.

They were ready now and Keen huddled over Barney's shoulder giving him the final word on his plans. They looked at the clock, timed their position.

Then they suddenly caught the outline of the second *Monsoon* flying boat, which was hurrying out to make its contacts with the *Waalund*, still about fifty miles away!

"Get about 600 feet above her, dead on her tail," ordered Keen, "and then dive to go below the level of her tail and come up in a stall dead over her, giving her the gun just as she starts to flutter. Get it?"

"I get it," grinned Barney. "I hope you do."

"Give me any sort of a break and I will," growled Keen. "Okay, gear down!"

Barney nodded, let the pontoon gear down for a water-landing position, then took Keen's hand. They gripped, their eyes met, and Keen knew he could trust the Mick. He slipped outside onto the wing root, crawled along to the rear, then slipped down the metal tubing of the float legs. He crawled forward along the long pontoon and held on.

The Black Bullet had the desired height now. The *Monsoon* was plodding on at something well over 120 when Barney started his dive. The motor was silenced for the job, and Keen was steadying himself with the forward strut as he crouched on the pontoon.

The amphibian went below the tail of the big silver flying boat, then Barney cut the motor completely. He eased back on the stick and the Bullet with her flaps down seemed to flutter over the tail of the *Monsoon* and straddle the fin with her pontoons. Keen, staring forward, poised for the mid-air change, then gave a quick nod. Barney dipped the black amphibian gently, then rammed the throttle forward. Keen slipped down, hooked one arm over the nose of the pontoon, then dropped as light as a cat on the broad back of the *Monsoon*.

The Black Bullet plunged upward and away and Barney could see the faces of the two men in the pilot's compartment. It was obvious that they had not realized what had happened,

so well had the contact been timed.

Barney let out a guffaw, curled away, and took up a position above and behind the *Monsoon*.

In the meantime, Keen had steadied himself on the broad back of the *Monsoon's* cabin. Then he crawled along, his legs and arms wide apart until he found the emergency hatch he knew must be somewhere in the roof. He fingered it and with two quick slashes of his knife, ripped the panel out and with one of the guns in his hand he dropped down inside.

ONLY on a ship the size of the *Monsoon* could Keen have gotten away with his contact. As it was, he was well inside the rear main cabin, and so far no one aboard even knew of his presence. He had dropped down in the aisle between two rows of cabin seats.

Before him was a wide bulkhead with a doorway leading forward. From the size of the cabin he sensed that the pilots were accommodated high in the nose. In all probability there were at least two more smaller compartments below the control pit.

He made certain that there was no one in the aft cabin before he went forward. Then he reached forward and twisted the lever latch handle of the doorway. He entered a square compartment and noticed that a dural tube ladder led up the side of the wall, evidently to an upper compartment which must be in line with the roots of the wide wings.

"Mail and freight compartments," he muttered to himself. Then he was startled to hear a voice—

"Who's there?"

There was a husky appeal to the voice, a strange pleading. But Keen took no chances. He darted to a corner, held his gun steady, and swept the small compartment quickly.

Then he saw a man huddled up in a corner on the floor. He flipped his small flashlight on, directed the beam on the figure.

It was Drury Lang, wild eyed and bearded, bound and shackled to a dural beam which ran from below the flooring to a point somewhere above.

Keen had to swallow his exultation as he strode slowly across the floor. Could he maintain his disguise under the circumstances? Could he get Lang out of here and still get control of the stolen *Monsoon*? Could he get the *Monsoon* back to Milford plant and still escape to the Black Bullet and fool the redoubtable Lang?

This was his great test!

"Who are you?" he snapped into the voice-disguising mike fitted into the chest pad of his coverall.

"I'm a Secret Service man connected with the New York Division. Lang's the name. Where the devil did you come from?"

"Right out of the sky," replied Keen. "What are you doing in here?"

"Taking a one-way ride I guess, but the devil only knows what for."

"You know where you are, don't you?" Keen's metallic voice asked.

"I guess, from the feeling in my

stomach every so often, I'm in an airplane. What's the game anyhow?"

"You are aboard a large flying boat which is being pirated and taken to the Dutch East Indies."

Lang allowed a particularly dumb look to soften his face as he tried to absorb all this information.

"But what the hell has a diamond smuggling outfit got to do with flying boats that are being pinched?"

"The diamonds were paying for the gang to swipe the *Monsoon* flying boats. You evidently got in the way somehow so that they decided to give you a ride and get you out of the way."

"Untie me, quick!"

"What for? What can you do about it?" Keen demanded.

"Well, you ain't going to leave me strung up here, are you?"

"I don't know why I should release you. You're nothing to me."

"No? Well, as an agent of the Department of Justice, I demand that you release me."

"And then, I presume, you'll go upstairs, shove a gun into the pilot's belly, and fly the *Monsoon* back, eh?"

"No, but I guess you can, can't you?"

"Sure, but again, why should I?"

"Because I'm ordering you to," snapped Lang struggling against his bonds. Keen had to admire the old cuss.

"Then when you get back with the ship and your two prisoners and get all the glory, you'll cook up some excuse to put me in the same brig and complete the job."

"I'm ordering you to release me, get me a gun, and help me get these mugs back to land," Lang barked again. Then he suddenly turned and glanced at Keen sideways and said: "Say, you don't happen to be a guy named Ginsberg, do you?"

For an answer, Keen slipped a small white card out of a small pocket in the waistband of his coverall and held it before Lang's startled eyes.

"The Griffon!" husked Lang, reading the card. "Holy Smoke!"

"So you see, Mr. Lang," Keen taunted, "you are in a tight spot, no matter what happens. What's the arrangements now?"

"Okay. Anything you say. Let's have it."

"I'll release you and you can help me nail the men aboard this bus. How many are there, by the way?"

"Only two, I think. A guy named Claggett and another called Wensley."

"That makes it easier," muttered Keen. "But you've got to give me your word that you'll pull no funny business with me. Remember, I've got a parachute and can step off any time and be sure of being picked up."

"Listen, you," Lang said in a confidential tone. "You get me out of this and let me get this bus back Okay, and I'll forget there was ever a guy named Ginsberg—or the Griffon."

Keen smiled under his mask. He knew he had touched Lang on the only vulnerable point in his makeup. He knew the old devil would give his right arm to deliver the *Monsoon* and the

two thugs into the hands of the authorities.

"It's a go, then, eh?"

"We'll shake on it when you cut these ropes."

In three minutes, Lang was on his feet again and gripping a big black gun, Keen had given him.

"One phoney move now," Keen reminded him, "and you hit the drink down below so hard, you and the *Monsoon* will come up somewhere outside of Shanghai."

"I'm a man of my word," growled Lang. "Let's go."

"You'd better be," said Keen, pointing outside where the Black Bullet coursed along convenient to receive any signal the Griffon might give.

TOGETHER now, they crept up the metal ladder and made their way into the upper mail compartment, eased along the gangway, and found the knob of another door. They stood, listened a moment, and heard the faint whine of a radio spark.

"One of them is in here using the radio set," said Keen. "Move fast now and get him when I open the door. Don't let him give a warning."

Lang nodded, moved over so that he could dart in when the Griffon opened the door.

Keen took a steady hold on the knob and turned it slowly. Then with a sure movement, he pushed it open and let Lang through.

The man at the radio panel was caught cold. He turned, one hand on a switch, and stared into the muzzle of the gun Lang held on him. He was a small stocky man with a warped face. His eyes were small and piggish.

"Cut it, Wensley," Lang ordered. "Reach!"

"How the—?" the man known as Wensley started to say, but Lang darted behind him, jerked his arms back quickly, and in no time had his wrists bound behind his back with a piece of the rope.

The Griffon took one look and saw that Lang had the situation in the radio room well in hand. Then he darted to the bulkhead and snatched at the small door that led into the control pit. He was in there like a flash and had the man at the big wheel covered before he realized that it wasn't Wensley returning from the radio cabin.

"Okay, Claggett," the Griffon, smiled. "You've hi-jacked your last bus. You've had a swell time since you first started this racket. It'll be rocks at Atlanta now instead of old van Aller's Amsterdam ice. Now then, we'll slip the robot pilot in, eh?"

Claggett didn't say a word. He sat there, holding onto the big wheel, his eyes small slits of bitter hatred. He was a man of medium build.

"I haven't seen you since the 1934 National Air Races when you managed to get that Renown Racer out of the country and sell it to a European aeronautical firm which wanted the 'inside' on that flush riveting idea. You've certainly stepped up some since then, eh. Picking up Milford *Monsoons* now."

"Who the devil are you?" Claggett asked finally.

"I'm known as the Griffon, Claggett. To my closer acquaintances, I'm a man named Ginsberg. Ever hear of me?"

"What's your split to get out?" said Claggett, still maintaining his icy calm. "Nothing. I've got mine."

"Yeh? How do you figure that?"

"That last rocket didn't get through, Claggett. I know where it is. A little dough in that, eh, Claggett?"

"The devil!" gasped the hi-jacker pilot.

"Now do as I said," the Griffon ordered. "Shove the robot in while we re-arrange the seating accommodation."

And Claggett had to sit back while the Griffon set the throttles for a 60 per-cent power output, then rammed in the lever that brought that Sperry robot pilot into action.

"That's all," smiled the man in the scarlet mask. "Step back inside now and Mr. Lang will take care of you and see that you are made reasonably comfortable in the mail compartment."

"You damn fool!" raged Claggett, "you can't fly this boiler."

"I can fly anything from a barn door to a . . . a *Monsoon*," retorted the Griffon, "and if I can't, it will be just too bad for you. Get it?"

"And where will you fly it?" asked Claggett, regaining his composure a trifle.

"Out to the *Waatlund* to pick up the other," taunted the Griffon.

"Why, do you think you can get away with that?"

"They expect you, don't they?"

"Yes, but how the hell . . . you can't get two of them. They'll blow daylight out of you when you get over the *Waatlund*."

"Believing, of course, that they are blowing hell out of you," the Griffon said. "That doesn't seem to make sense, Claggett."

"Listen, if you get away with this, I'm willing to go to Atlanta for a stretch. A guy ain't safe with a mug like you around. I'll take Atlanta. Of all the damned fool ideas, yours takes the cookie."

For a reply, the Griffon simply bowed Claggett through the doorway and into the mail compartment where Drury Lang awaited him with one large gat and a length of manila rope.

BUT while Keen had been very optimistic before Claggett he was far from certain how he would make out. He began to wonder whether he would not be wise to be satisfied with what he had and turn back with the *Monsoon* and get Lang to safety.

He was pondering on this matter when Lang came into the control pit. The detective stepped a little gingerly, for he was amazed and completely overawed by the mad array of instruments and control levers. But he was jubilant nevertheless.

"Well," he beamed rubbing his horny hands together, "I took care of those mugs. They'll never move until we chop them apart. What's next?"

"You sit here," ordered Keen through

his metallic phone. "Don't touch anything until I get back. I won't be two minutes."

He darted inside the radio cabin, swung the switch, and moved the wavelength dial around to the special band the Black Bullet's set was tuned to. Then he called a man named Pulski.

"Okay, Pulski," he spoke carefully into the hand mike. "All set here. Now get everything straight. We're heading for the depot ship, you know. As soon as you see someone come out to us, you 'get' the vessel with the four small bombs. Remember, you've got to at least disable her. Take either the funnels or the screws."

He got a careful repeat of the order, then he ordered Barney to change the wave length of his set to that the men aboard the *Monsoon* had been using for contacting the *Waatlund*.

"You'll be able to keep in touch with what's going on and act accordingly."

"Okey-doke," came back Barney, "but if you're going to do anything, you'd better work fast. There's the tub a short distance ahead of you."

"Right! Remember now, no busting things up until I get old van Aller." And with that Keen snapped the switch and ran forward into the control cabin.

"Hey you," bawled Keen toward Lang. "Get up there, through that hatch under the instrument board, and get into the marine gear locker. Get into the flag locker and get a 'V' flag."

"What the hell's a 'V' flag?" growled Lang. "I ain't no gob."

"No, you're just a dumb detective. A 'V' flag is a white square with a red St. Andrews cross on it. Go in and get it and run it up on that stub mast in the nose. You can probably hoist it from the marine gear locker nose hatch. Get moving."

"What's that flag for?"

"It's the international code meaning 'I require assistance.' We're getting old van Aller aboard . . . somehow."

"I get it," grinned Lang. "Say, by the way, you never knew a guy by the name of Keen, did you?"

"Sure," answered the man known as the Griffon. "His old man makes saws, chisels, and hatchets."

"No, I don't mean that guy, this bird—"

"I don't know any other. Now get down there and get that flag up. There's the *Waatlund* down there."

He booted Lang gently in the tail, hurried him through the hatchway, and took over the controls of the big *Monsoon*. He peered out of the streamlined windows and saw Barney easing away. Then he circled over the *Waatlund*.

He jazzed the throttles and made the big 1,000 h.p. motors spit and cough. Then he cut them off as he saw the small white signal flag run up the stub mast through the opening in the marine locker. He carefully let her glide down for her landing.

Lang came back and watched Keen with puzzled interest as he adjusted the flaps and let the big flying boat slither across the easy rollers for a soft landing about three hundred yards clear of the *Waatlund*.

"Now sit tight and don't move until they come out and board us. Let them into the main cabin entrance while I cover them. After that, watch what happens."

Keen slipped out into the marine locker, selected a sea-anchor, and tossed it overboard to hold them reasonably steady. Then they crawled back and watched out of the radio cabin port-hole.

In a minute a searchlight swept across the water from the bridge of the *Waatlund* and caught the *Monsoon* full in its glare. The small white signal flag flapped in the breeze and indicated that they were in trouble. It was several minutes before there was any response, then an Aldis lamp twinkled and Keen watched it carefully.

"What do they say?" asked Lang.

"Just what I wanted them to say. They're coming aboard."

Lang stroked the blue barrel of his gun in anticipation.

A dory was put over the side and they could see four men going down the ladder. In a minute more, they were pulling away and heading for the bobbing *Monsoon* under the glare of the searchlight. Keen and Lang studied them closely.

"There's our man in the stern," the Griffon muttered. "He's the one we want."

The boat came well around the bow, then it eased in carefully under the wing and drew up to the cabin door which Lang drew open without being seen. Keen darted into the radio shack, snapped the switch, and called the man known as Pulski.

"Right!" he yelled. "Let 'em have it. . . . Hello! Look out, they're shooting something off a catapult. Get him, if he tries to block us off!"

Everything happened fast after that.

FIRST off, Keen suddenly remembered the other *Monsoon*, and while a Fokker two-seater leaped off the catapult and screamed into the sky, a big flying boat came churning around the stern of the *Waatlund* and taxied toward the ship Keen and Lang had captured.

"They're anxious," whispered Keen. "They've been waiting to get away. Something's worrying them."

But two men in greasy dungarees now came up the side and crawled into the half light of the cabin. Keen acted fast and tapped both of them smartly with a rubber-covered billy. He let them roll under the upholstered chairs. Another man, a flint-faced devil in shoddy ship's officer kit, came in and stared—stared into the black gun held by Lang. "Come on in and sit quiet," Lang ordered.

The man started to whirl and yell, but Lang brought the gun up under his chin quickly and he went to his knees gasping. Keen then took care of the big Dutchman van Aller who came up puffing like a grampus, growling and asking questions.

"This way, please," said Keen shoving the man into the radio cabin. "Tie those guys up quick, Lang, then cut

the painter on that dory they hooked up outside."

He rammed his gun into van Aller's back, stuffed him down in the operator's chair. Then he closed the switch.

"Now get this, van Aller," he ordered in no uncertain tones. "You tell those birds in the other *Monsoon* to follow us. We're damned serious about this, and these two ships are going back where they came from."

"Vass? . . . Vass?" gurgled old van Aller, still unable to comprehend what was happening. "Vere iss my son?"

"If you think anything of your son, you'll act nice and see that that other ship follows us. If it doesn't, we'll see that it's made to—or."

"Vere iss my son?" began van Aller all over again.

"Look here, van Aller. You've got to move fast. Your game is up and the easier you can make it for yourself, the better it will be. If these ships go back to Connecticut okay, they'll have nothing but smuggling on you. If they don't, you'll have plenty to answer for. Now, there's the mike and you can give your orders."

"But . . . but . . . How . . . ?"

"Never mind how or why. Talk!"

Lang came in grinning.

"Got 'em! The dory's free. Let's go."

"Go on, talk van Aller," ordered Keen again. "Here's the mike."

The big Dutchman took it and Keen held his gun up to the man's chest. There was a glint in his eye and the Dutchman knew the game was up.

"Allo, Heydemarck. . . . Allo, Heydemarck," he spoke.

"No Dutch now, van Aller," husked Keen. "Only English."

The Dutchman nodded in resignation. He caught the reply from the other *Monsoon*.

"Heydemarck . . . this iss van Aller, Heydemarck. We are taking off at once for a hurried trip to Long Island Sound again. Hans iss in mooch trouble, and Claggett has an idea . . . no . . . no, this iss me—van Aller.

You will follow us back. . . . You understand? . . . All right."

He put the mike down with the air of a very weary man and threw out his hands. Keen leaned over, snapped the switch, and gave Lang the nod.

"Watch him," he said. "I'm taking off."

He charged into the control cabin, pressed the starters, and let the four big engines pick up. Then he eased her clear and watched the other *Monsoon* nose around into the wind. He wondered why things had been so easy.

He gave her the gun, let her zip over the waves and into the air. Almost at the same minute the Black Bullet shot across his bows and slashed toward the black hulk of the *Waatlund*.

Keen had his hands full figuring out the instruments and controls, but he managed to glance out and see the Black Bullet veer suddenly, hold her position, then slither across the two black funnels of the depot ship.

Keen waited anxiously as the big *Monsoon* climbed under his piloting. He turned her and watched the Black Bullet. There was a flash out of one of the *Waatlund's* funnels as the Bullet cleared, then two monstrous spurts of smoke and flame came up.

"Got him," beamed Keen as the *Waatlund* shivered. He knew the bombs had exploded down below and had blown the boiler room to atoms. There would be no escape now. He could call a Coast Guard unit at any time and have what was left towed in.

Then, as he turned the nose of the *Monsoon* around and headed north-east for Long Island, something else caught his eye. The gray Fokker, the third to turn up in this adventure, came thundering at him with guns flaming.

He huddled behind the wheel, felt the bullets patter about the big wings and thrum through the dural framework. Then out of nowhere came hope. The Black Bullet under the guiding hands of Barney swept into the picture again. With a splash of reddish yellow from her gun ports, she hammered down on

the Fokker from an acute angle and pounded lead at her until she swung clear of the *Monsoon*. The Fokker was fast and wickedly manueverable, but she was outgunned.

Barney waited his chance, displaying all the cunning of the Griffon. And then with a beautiful curving turn, he drew the nose of the Black Bullet up, poised a second, then plunged dead on the Fokker which had dived for safety. Four guns flamed from the Bullet.

"Beautifully done, Barney," Keen muttered to himself, as he watched the riddled Fokker fly clean through her wings and hit the water below like a massive shark.

That was all as far as the Fokker was concerned, and Barney swung quickly and settled himself dead on the tail of the *Monsoon* flown by Heydemarck.

Keen set the gyro compass and the robot pilot and went back to where Lang sat with his legs crossed watching van Aller.

THE Dutchman was now white and almost blubbering. His world had toppled about him in a shambles of torn wings and scuttled ships. It was all over and he knew that his best bet now was to play safe and cut his penalty as short as possible.

"Well," demanded Keen glaring at him. "Are you ready to play the game now? You saw what happened to your Fokker fighter. The same can happen to the other *Monsoon*, if they make one move. Do you want to talk to your gang again?"

"I will talk," muttered van Aller, a broken soul.

He took the hand mike and waited until Keen had snapped the switch. Then he called Heydemarck.

At first there was a torrent of abuse, which van Aller listened to with weary resignation. Finally he was able to speak and then he told Heydemarck the doleful news.

"You can try to get away, if you like," van Aller explained. "But you



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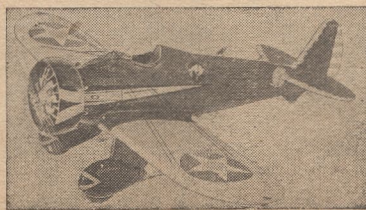
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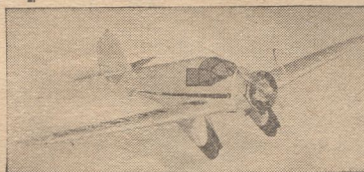
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can't and you know it. If we return the ships, they can only hold us for smuggling diamonds. We're licked. . . . beaten anyway. Our depot ship is done for and we couldn't get clear now, no matter what we do."

There was a jabbered appeal for a few seconds from the other *Monsoon*, and they turned and glanced out of the port hole. They saw the big flying boat start to turn away, but before she had made thirty degrees, four long scarlet and yellow fingers prodded out from above and forced her back.

"You see," warned van Aller. "You can't get away. You had better take my advice and follow us. You can't get away, Heydemarck."

With that, Keen flipped the set out again and nodded.

"Now then," he smiled, "while we are on our way back, will you please save me a lot of trouble and tell Mr. Lang just how the story runs. You know, your rockets that delivered the diamonds, and which the bland natives of Black Point thought were meteors; the details of your son's association with the Milford aeronautical plant; and just how you planned to disguise the *Monsoons* on the way to the Dutch East Indies so that you could produce two machines capable of carrying out the contracted schedules between Batavia and Amsterdam."

"What's that?" gasped the amazed Lang.

"He'll tell you," smiled the man they only knew as the Griffon, "and it will save me the trouble."

He reached over quickly then, took Lang's gun away from him, and stuffed it into one of the heavy leather holsters at his thigh.

"Just to be sure, Mr. Lang," he said with a meaning glance.

"Hey, wait a minute!" shouted Lang. "You can't leave me like that. Suppose this guy gets gay and tries to—"

"We'll just remind Mr. van Aller that he had something in that rocket idea—something that might come in useful to the United States someday. And if he uses his head and—well, it might help an awful lot. I don't think he'll try anything gay now, but I also want to make sure you won't, Mr. Lang."

Van Aller beamed at the prospects. Lang sat and glared at his captive, then took out his notebook and a particularly stubby pencil and sucked it in anticipation.

Keen took one look outside and saw that the Black Bullet had the other *Monsoon* by the tail, so to speak. Then he went back into the control cabin and took over the big wheel. He glanced out through his window, grinned and muttered:

"A special case of O'Doul's Dew for you when we get back, Barney."

THE telephone bell rang beside Kerry Keen's bed at 8 o'clock the next morning. Keen sat up and stared at Barney who stood at the foot of the bed with a lavish breakfast tray.

"I'll answer it," he smiled.

It was Lang, all of a bubble and a flutter.

"Hello Lang?" roared Keen. "Where the devil are you? I've been looking for you all over Connecticut."

"Yeh? Well, you can go back to bed now. . . . No, I mean you can come down here and see me if you get a chance today sometime. I got a story for you, you mug."

"I can't wait. Golly, you gave us a scare. I've been searching for you all over Old Lyme. What the deuce happened to you?"

"Yeh, I know. Scott told me about it, but I can take care of myself. I got nabbed, but I got away with it and scored the biggest snatch the Department has ever pulled off. You know those two flying boats that were stolen a few days ago? Well, I got those back, too, and the gang that swiped 'em. How's that for a dumb dick?"

"Amazing! No wonder I couldn't find you. I was searching all over Old Lyme for hours last night. I had about given you up. But I'll be right down. I can't wait to hear this one. You Secret Service men get all the fun."

"You come on down and I'll tell you a story that will make your hair curl."

"I'll be there for lunch with you," barked Keen hanging up.

"I think we got away with it," grinned Keen, taking the breakfast tray.

"If you did, pigs will fly," remonstrated Barney helping himself to some of Keen's toast.

"Well, get out my gray worsted spats, and all the doings, Barney. I'm going down and have a quiet laugh. You might run up to New London this afternoon and see what you can do about a cheap diving suit. We do a little underwater stuff in a couple of days, you know."

"Yeh, I know," growled Barney. "You'll have me doubled up with the bends, too, I suppose."

"Perhaps. But remember, Barney," smiled Keen. "There's nothing that won't respond to generous dosings of O'Doul's Dew."

Barney grinned widely: "Very generous dosings," he agreed.

WHEN Keen sauntered into Scott's office about noon, he was a perfect picture of a dapper young man about town. He provided a startling contrast to Lang who was still bearded, red-eyed, and generally bedraggled. Old Scott was not much better, but he had a cheery greeting.

"Sorry to have sent you on a wild-goose chase, Keen," Scott said, "Lang here seems to have been miles away from where we believed him to be."

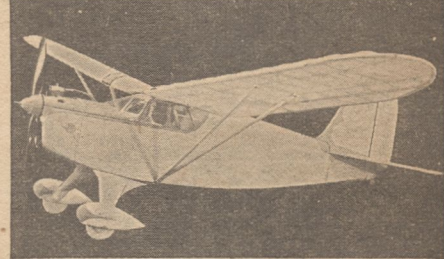
"What the deuce happened anyway?" Keen said dropping into the only easy chair in the place.

"I ran into the Griffon!" Lang suddenly blurted out. "Sat with him in a plane—actually talked to him!"

"Now look here, Lang," remonstrated Keen. "If you're going to start that line again, I'll be off. I'm busy."

"But I'm telling you straight," Lang said. "Ask Scott here. He saw the guy I captured and he swears to it. I really saw the Griffon guy."

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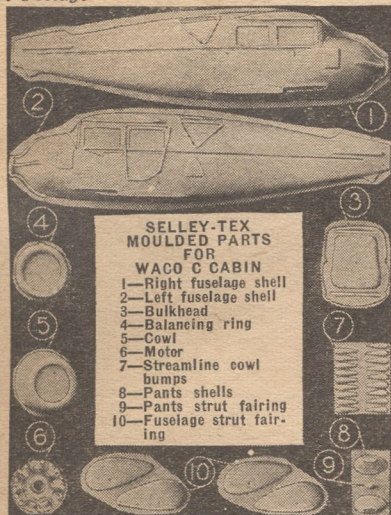
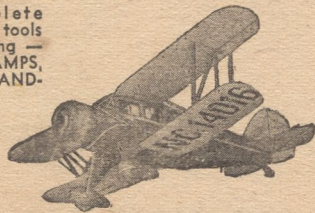
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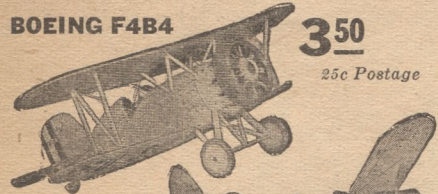
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FAIRCHILD 22

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Keen lit a cigarette with a bored air, sat back and let Lang tell his story. "And do you mean to say you were with him and you wouldn't recognize him if you saw him again?" demanded Keen completely huffed.

"Of course not. How could I? He was completely masked and spoke through some sort of a portable microphone so that you couldn't tell what his voice really sounds like."

"But I'm supposed to be the Griffon," argued Keen.

"Naw, that's out for sure now, Keen. This guy flew one of the flying boats back. You couldn't fly one of them! That's out. Besides, you were in Old Lyme looking for me, weren't you?"

"That's where Scott sent me. That's where you were supposed to be, wasn't it?" replied Keen. "But," he added, "what I can't figure out of your dizzy story, Lang, is how this guy, the Griffon, got away after you had brought the ships in with all those guys aboard like that."

"That's what I was wondering all the way in," said Lang. "I wondered how he was going to get away with it, too. But he did, the clever devil."

"How?"

"Well, you see, this other guy who was working with him in this black plane, stayed over the other ship and made them follow us all the way to Milford. It was still dark, of course—somewhere between three and four, I think—and a few minutes before we landed he used the radio and put in a call for a Coast Guard cutter to hurry to a position about two miles outside of Milford, just off Stratford."

"But how the deuce did he get away?" demanded Keen.

"Take your time. Here's what happened: He put our boat down on the water and waited while the guy in the black plane simply sat on the tail of the other and made them plunk it down alongside of us."

"But how did the guy get away?" demanded Keen, sitting up straight.

"Say, you're an annoying cuss!" barked Lang. "You seem to forget what we have really accomplished. We cracked a big diamond smuggling ring and recovered two flying boats that are worth about half a million dollars. Yet

all you worry about is how did this guy got away without us finding out who he was."

"That seems important to me," argued Keen.

"Well," said Lang with a guilty air. "I really intended to nab him somehow, before he got away, but the swine fooled me. Here's what he did: Once both flying boats were down and bobbing about while a Coast Guard cutter came up out of nowhere, this Griffon slipped back to where I was sitting with this van Aller guy and gave me a gun to hold the Dutchman down. Then he ran through the cabin, apparently climbed up on the seats, and went out through an emergency hatchway. The black ship which had been following us came down out of nowhere and this Griffon guy dived overboard. He timed his dive so well that before we could make out where he went he was climbing up on the floats . . . er, pontoons . . . of the black ship. And then they took off again."

"But you could have fired and held him," suggested Keen.

"Well, between you and I," confided Lang, "I tried to, but I found that the swine had given me a gun that wasn't loaded."

"So the man you call the Griffon got away," grinned Keen.

"Well, considering everything, he was entitled to," Lang said with a dumb look into nothingness. "But I would give a few bucks to know who he was."

"So then, to complete the story," broke in Keen, "the Coast Guard cutter came up with flags waving and captured the two flying boats and saved old Drury Lang."

"Even so," remonstrated the detective, "I think I did a pretty good job."

"Well," said Keen, "I think that you and that guy of mine, O'Dare, both drink the same liquor. He tells cracked stories, too."

And with that, Kerry Keen, the young ballistics expert, sauntered out—without even taking up Lang's luncheon offer.

Lang looked after him, then turned to Scott.

"Say," he grunted, "there is something goofy about that guy!"

Build the F. A. Fighter

(Continued from page 50)

ments on it without it cracking.

Carve your prop slowly and carefully—because it is very important to have the same pitch as in the original. Provide a good bearing by using the same arrangement as on the nose block. Any good free wheeling will improve the glide considerably, since this reduces the drag of the propeller.

Now make the rear hook of .034 wire. One side goes through the eyelet and should stick out about ¼" when, on the other side, the little handle touches the wood. Six strands of lubricated rubber will give plenty of power and endurance as well. The wing struts are made of ⅛" by ¼" hard balsa secured to the body with aid of pins and ce-

ment. The final touch is the wire bridges across struts. Glue these several times.

FLYING

SINCE this model has built-in negative trust, stalling hazards are eliminated. To be more specific, both the wing and the tail are set at a positive incidence compared to the thrust line, so they are both "lifting." Slight adjustments can be made by warping the elevator flippers. The model should fly to the right.

After a few glides you can wind her up 50 turns and increasing the number of turns each flight. Correctly adjusted,

(Continued on page 84)

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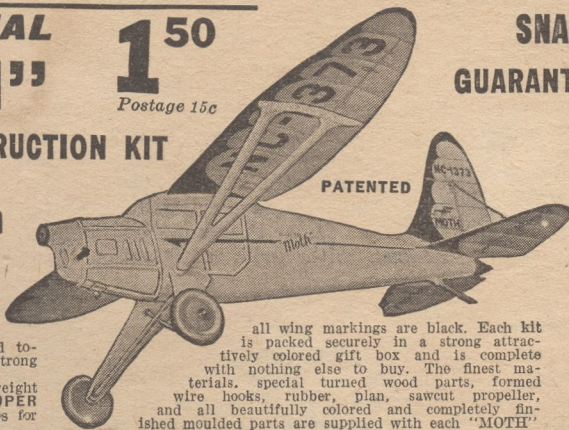
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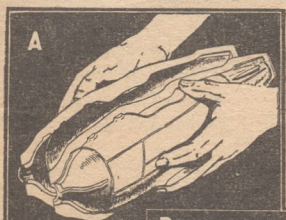
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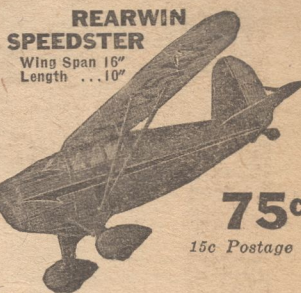
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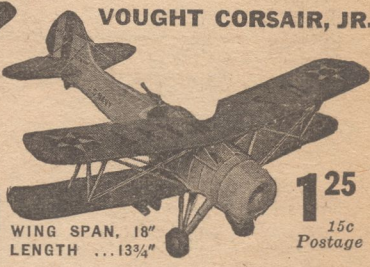
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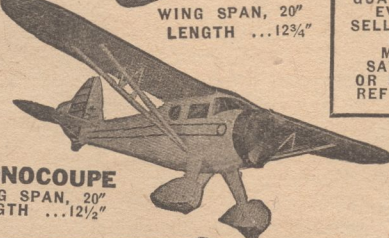


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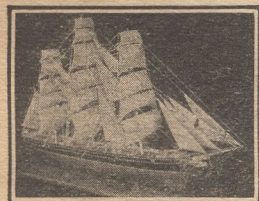
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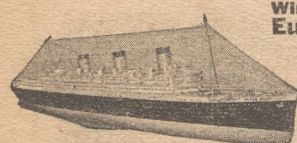
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pleted, fans, we'd be glad to have you send us a photo of it for use on our With the Model Builders page. How about it?

Flight Opera

(Continued from page 16)

to work. It was bound to. His brother brass hats, having been harassed by the products of the Pinkham trick brain, got into a huddle and swapped suggestions. A colonel with a singed mustache apparently produced the best idea. One of the other officers, whose tunic had been sprayed with green ink from a fake Pinkham *boutonniere*, nodded with grim satisfaction upon hearing it.

Over on the Ninth Pursuit drome Captain Howell and Lieutenant Gillis met in the latter's hut—likewise to discuss the possibility of knocking Phineas Pinkham off his lofty perch.

"It is that old D. H. 9 that interests me," said Bump. "It is out there about four miles from Bar-Le-Duc. Even if it has been washed off the books, it could get up after a little goin' over. Casey told me—"

"Ha," Howell enthused, "puttin' a crate where he can get his hands on it is like smearing honey all over the doorway of a bear's cubicle. I'm for it! I'll bet it'll work. When he comes in again, we'll 'fix up' that road near where that D. H. is sitting and—shake, Bump. Boy, I hand it to you!"

"We'll spread the word to him that von Schram is in the sector, too," Bump plotted.

Across the lines the German *Herr Obersts* were in a huddle, too. But the Krauts did not know that Phineas had been promoted. The Pinkham skin was all they wanted. They didn't care whether it belonged to a colonel or a corporal. A big Teuton with a neck like a Spanish bull was gutturaling.

"Ach," he rumbled with an emphatic bang of his fist against the table top, "*das Pingham he shouldt be kaput, ja! Das ist der besser idea was ist Wilhelmstrasse shouldt get. Already der Fraulein Satan she ist back of der lines, but der Dumkopfs they don't shouldt know. Zo innocent der Fraulein ist, hein?*"

Another Prussian Kultur pupil chuckled. "*Ja, she vill gedt das Pingham und—pouf! Hoch der Kaiser!*" and he raised a stein of beer.

Which all goes to show you that the exponent of magic in all its forms was sitting about as pretty in his new colonel's uniform as Napoleon on the night before Waterloo.

It was in Nancy that the luring word was dropped into one of the lily-pad ears of the Pinkham scion. A Brigadier spoke of a woman who kept a small flat in the Ville Vienne. "Yessir," he said to Phineas, as they walked past the Church of the Cordeliers, "I know her slightly. Very famous woman. Asked me about you, Colonel. Apparently she has seen you about. You—er—have quite a way with the—er—ladies, eh, what?"

"Well," swaggered Colonel Pinkham, "they don't exactly sic airedales onto me. Who is she?" He flourished his cane.

"Ah," breathed his companion, "who hasn't heard of her? The beautiful woman here to entertain the A.E.F.! I can see her now singing the part of Elsa in Lohengrin at the Metropolitan Opera House. Ah-h-h-h, her flaxen tresses—her big blue eyes—"

"Boys," exclaimed Phineas, "I have heard of her. Somebody told me that compared to her Jenny Lind sounded like a flock of crows getting chased by a burst of archie. Haw-w-w-w! How about givin' her a call, huh?"

The brigadier was only too willing. Within fifteen minutes Colonel Pinkham and Frieda Stenje were talking like old grammar school sweethearts. Babette seemed very far away while Phineas was staring at the blue-eyed heart stimulant. Frieda played a couple of her personal records for him on the phonograph. Her voice lulled him into a state bordering on coma.

"So maybe you lak to have them?" Frieda cooed, handing two records to Phineas after the echoes of her voice had wafted into the silences across the Meurthe. "Whan you play tham, you think of Frieda, no?"

"Boys, wait until I git back to Boonetown," enthused her victim. "I'll panic them in the barber shop. How 'bout autographin' the records on the edges with a needle, huh?"

The evening waxed on. Phineas was sipping at a glass of strong spirits when somebody burst through the door. Frieda squealed. A big Frog officer glared at Colonel Pinkham.

"*Sacre!*" he screeched. "*Avec Frieda, my wife, oui? Peeg! Chien! I keel you!*"

"Oh, Francois," the Norwegian thrush wailed. "No—not that! Not the gun."

Phineas, seeing the big Frog officer reach for a gun that was on the mantel, leaped out of his chair, taking off with plenty of speed. Bang! Bang! Bang! The Yankee high officer gunned through the door and his initial momentum carried him across the little square. A bullet ploughed a little ditch along the top of his right ear. Another whined off the cobble stones and went zipping through the window of a bakeshop. Phineas ducked into a side street, crabbed in through an open door that was below street level, and hid behind a pile of empty wine kegs. After wiping sweat from his brow, he began to give heed to his brain which was asking him a moot question. Why had that Frog known just where to find that gun?

"There's somethin' fishy about it," Phineas muttered. "His wife, huh?"

(Continued on page 86)

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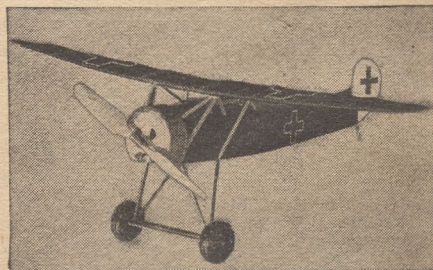
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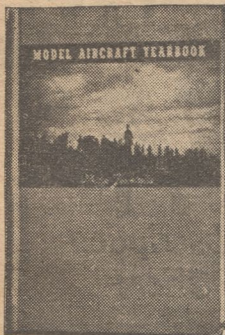
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That snail eater had a map like a wart hog. Gosh, it's not so hot bein' a brass hat. I—" Light from a window across the street played down upon a heap of old magazines close to the new Yankee brass hat. He picked up one and flipped the pages. It was an old copy of a magazine printed in the home land of the A.E.F. and on one page he saw an item that intrigued him. *Have Fun at Parties*, he read. *Play the Zither Without a Single Lesson. Professor Bilbo's Magic System Is Yours for Twenty-Five Cents.*

"I will look into that," Phineas promised himself and folded the magazine up. With it in his pocket he evacuated the hiding place. Out in the square there was great excitement. The Frog officer who had assaulted him, eyes a little glassy, was in the hands of two *gendarmes*. A big Frog limousine stood near the curb and a big man with a spade-like beard and a lot of medals was tossing a load of French at him.

A Yankee officer moved close to Phineas and chuckled, "Ha, quite a lot of excitement here. That Frog Colonel chased a Yankee brass hat out of the place. When they arrested him for attempted murder he said he didn't know that the gun was loaded. He swore by Lafayette and Joan of Arc that he was telling it straight. Funny, huh?"

"Yeah, haw-w-w-w!" the Boonetown pilot echoed the laugh dispiritedly. "Well, I gotta be goin'."

BACK at his hotel Colonel Pinkham got quite a shock. Four of his fellow officers eyed him very nastily. One cleared his throat noisily and trumpeted: "So you were in a brawl awhile ago, Pinkham? Calling on a French officer's wife, huh? Fellow took a shot at you, too. That is conduct unbecoming an officer, Pinkham. Nasty mess will come out of this. I suggest you resign. We—er—heard about—"

"Yeah?" Phineas yelled. "How? Nobody knew it was me there but the Frog—and he has gone to the bastille. So it wasn't *that* bird that told you!"

The brass hats swayed like tenpins when the ball knocks one down and leaves the rest vibrating. Phineas eyed the brigadier who had led him to the abode of the Norwegian thrush. "I get it. It was a frame. Tryin' to bust me, huh? I'm not good enough for you, huh? I'll show you bums. You wait. Resign, huh? Haw-w-w-w-w!"

Two hours later the word came that Colonel Francois Jacquet, in the bastille, had discovered to his utter horror that he had been relieved of a very important leather case somewhere or another in which were papers concerning troop movements and maps of the sector. Intelligence officers and all other kinds hot-footed it to the home of Frieda Stenje. The prima donna was highly indignant.

"Hah, I mak' it wan joke," the pulchritudinous soprano screamed temperamentally. "The French officer plays, too. It is the joke and you come to mak' it that I am the spy. I call the Ambassador. I write the King. I am very much insult'."

"But the Colonel was arrested because the gun was loaded with real bullets," an Intelligence officer shot at her. "He was to have blanks in it. Now explain that, Madame Stenje."

"What I know about gons?" Frieda trilled, tearing at her hair. I do not know a good bullet from wan bad bullet. Search here. You find noddin'? Go. I write King—"

When all was over and Frieda was given a clean slate, Phineas took his departure heaping a barrage of threats onto the heads of the plotters.

"Boys, are you in a mess?" he chuckled. "It's conspiracy and I will tell Pershing. Whose fault is it if the papers have fallen into the hands of the Kaiser's villains? I ask you. Haw! Adoo, gentlemen. Sleep tight. It means only about twenty years for all of ya in Atlanta, haw-w-w!"

A COUPLE of days later Phineas Pinkham called to the Ninth Pursuit Squadron to pep up the Spad pushers and voice the dire need for the apprehension of the spies who were gnawing into the box of plans of the Yankee drive.

"They think you've all quit flying at Chaumont," he plagued them. "I was sent down to give you a shot from the needle as the Allies are in great danger and they know I have a way with me on the Ninth Pursuit drome. I—"

Major Garrity made a very uncomplimentary noise.

"Awright, Major," Phineas reprimanded him, "just keep it up. I will have to fire you, you know. I just came here in a nice friendly way to ask you to make these bums—er—men watch out close for spies getting picked up at night. All I get is insults but those are the orders and I expect them to be carried out." He twirled his cane and stifled a yawn.

Suddenly Bump Gillis opened up. "Uh—er—Colonel Pinkham, sir," he drawled in an exaggerated show of respect. "I hear that *Rittmeister* von Schram is in this sector."

"Huh?" Phineas dropped his cane. "Yeah? That big Heinie fathead here? I—er—harumph!" He resumed his haughty mien. "I suppose that's why you stay close to the ground like a cutworm, huh? Scared of the *Rittmeister*, huh? Well, I expect you to have flights in the air all day tomorrow, Garrity. Wing's orders. Bong—good evening to you bu—er men."

Outside Phineas paused, eyes alight. "Von Schram," he muttered. "Oh boys, the biggest Heinie flyer since Richthofen. An' I have to be a colonel with a shine on my pants! Huh—er—I would just like to git one crack at that big—"

Inside the farmhouse Bump Gillis was winking at Captain Howell. The latter went to a window and signalled to somebody across the tarmac near the hangars. Sergeant Casey received the signal and grinned. Then he started for a motorcycle in the sidecar of which were twenty empty grog bottles. The mechanical bug chugged away just before Colonel Pinkham climbed into his

means of official locomotion. Yes, skullduggery was abroad and it was not crawling on hands and knees.

Chaumont was in a dither. Plans that had been carefully guarded for weeks were in jeopardy. Colonel Francois Jacquet was reduced lower than a sub-cellar. Human bloodhounds clad in khaki searched high and low over the Frog officer's back trail but they could not find the leather case. Spads flew at night to frustrate any Hun attempts via air to pick up secret agents. Fraulein Satan was seen in a dozen places at the same time. All this did not worry Phineas Pinkham as he rode out of the drome. He was thinking of a Spad seat and how nice it would feel to his empenage. Oh, for a crack at von Schram—but how to go about it?

It happened, however, that Phineas had not reckoned with Bump Gillis and Captain Howell.

At a cross-roads two miles from Bar-Le-Duc the car which carried Colonel Phineas Pinkham seemed to hit a mined area. Three loud reports lifted the Boonetown patriot's skypiece right off his head. The car wobbled and lurched like a bear with corns and landed in the ditch. The driver got out and went back into the road. Then he called to Phineas and pointed.

"Broken bottles, sir," said the non-com. "All over the place. Some lousy—"

"Why you have no sense of humor," Colonel Pinkham chided him. "Imitation is flattering. That is what I used to—er—start in fixing the flats, Corporal. Toot sweet, comprenny?"

Just across the field near a line of trees Phineas thought he saw a light blink. He started in that direction and in less than three minutes was staring at a frazzled two-seater that was squatting in the shadows. A calculating gleam came to the Pinkham optics. His fingers itched. Turning, he yelled at the non-com and the man trotted up to him.

"I'm goin' to take this thing up," he told his chauffeur. "It ought to take me the rest of the way. Get up there by the prop and when I tell you, you turn it over. I'll see what makes it tick, if anything. Haw-w-w-w!"

Inside the pit, Colonel Pinkham heaved a deep sigh of contentment. He switched on and yelled at his one-man ground crew: "Contact!"

"Huh?"

"Spin the prop, dope," shouted Phineas. "Then duck!"

The dough finally got the idea and Phineas soon had the senile D. H. 9 perking like an asthmatic owl. To the crate-hungry trickster from Boone-town, Iowa, the sound was as smooth as quicksilver running over velvet. He gave the wreck the gun and it waddled across the field duck fashion. With a creaking of bones and a rattle of joints the ship took off and Flight Sergeant Casey, hidden in the bushes a hundred yards away, danced up and down with unrestrained glee.

"They got him now!" he chortled. "That squares a lot of things, ya crack-pot!" he yelled up to where Phineas was fighting to lift the old two-seater to some kind of altitude. "Oh, if you

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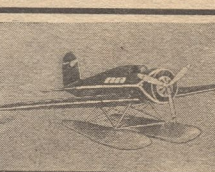
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only break your neck, you fresh mug!"

AND now Colonel Pinkham was skimming toward Nancy with a satisfied grin on his face. "Haw-w-w-w!" he gloated. "I am dumb, huh? They're out to bust me for stealin' this crate. Bump Gillis is in on this. Broken bottles, huh! They miss me, that's it, haw-w! Boy, it's swell to have such friends—the big bums!"

The astute Phineas made a landing eight miles from Nancy. He ran the two-seater under a great blanket of camouflage that had been hung between two trees on some previous occasion to mask an anti-aircraft gun. Soon afterwards he was shank's maring toward the famous old city in which Charles the Bold was wont to throw binges. The Wing had not seen Colonel Pinkham for days, but the fact seemed to have slipped the irresponsible Yank's mind. Chaumont was getting worn out with listening to complaints about the Pinkham free lance artistry. Major Rufus Garrity notified the wing just about that time that Colonel Phineas Pinkham had stolen a D. H. 9 and that something had to be done about it. But nobody saw Phineas Pinkham land the D. H. 9 and even Chaumont was not interested in circumstantial evidence. Captain Howell and Bump Gillis sulked in their huts at the outcome of their plot and swore to cut themselves a piece of Pinkham throat whenever the opportunity presented itself.

In Nancy Colonel Pinkham sat in a hotel room and perused the magazine he had lifted out of the cellar of the Frog abode in Ville Vielle. Having torn out the zither playing ad, he flipped the pages indolently. Suddenly he sat up as though his chair had been charged with electricity and his eyes snapped open before a page of photographs featuring the world's most interesting personalities. Among them was a picture of Frieda Stenje, the Norwegian thrush. Right next to it was a picture of a bull-necked individual captioned: *Otto von Schram, leading basso of the Leipzig Opera Company.*

"Well, I'm a—for the love of—can you beat—?" stuttered the Yankee flying officer. "Right close together—that's funny." He looked at the date on the magazine. It was January 1915. Back went his bulging eyes to the paragraph that linked the two pictures. "*Rumors have it on the Continent,*" he read, "*that von Schram will not wed the Norwegian soprano until after the war is over. Von Schram will join the German Air Service immediately, it is said.*"

"Fancy that!" chirped the Boonetown pilot as a flight of thoughts began to wingslap inside his head. Slowly a cryptic grin began to spread over the war map of Colonel Phineas Pinkham. He forgot that he was being hunted by M. P.'s and sallied abroad to do a little shopping in Nancy. Two hours later he came walking across a cobbled square to his modest hotel. He carried a big package under one arm. His alert eyes caught a glimpse of two men lurking in front of the place. Their brassards caught the light from a nearby lamp

and Phineas promptly right-ruddered, accelerated speed and came to the conclusion that he could do without his toothbrush and comb for the nonce.

"It's all for the Allies," he ruminated. "How can I track down dangerous spies sittin' in an armchair at the Wing? Haw-w-w-w! It's a lot of trouble everybody has gone to tryin' to bust me. It is like trying to help a burglar git out of jail when all the guards have gone on a strike and the doors have been taken off. Haw-w-w-w! Cripes, this contraption is heavy."

While Phineas was trekking toward the place where he had cached the D. H. 9, the story went the rounds that he had deserted the U. S. Army and had fled the war zone in a stolen airplane. Major Garrity and his brood eyed one another bleakly.

"He'll git shot," groaned Bump Gillis. "And it's all my fault. Oh-h-h-h me!"

"Oh, I was in on it, too," Howell clipped. "We ought to have known he was desperate. That guy couldn't remain a colonel. Maybe he took that thing over the lines and got shot down in it. Casey said that it would come apart if a guy sneezed in it."

When Major Garrity heard how Howell, Gillis and Casey had connived to bait Colonel Pinkham, he threatened to tear them in bits.

"We thought you would be tickled, too," said Bump in a quavery voice. "You wasn't exactly wrapped up in the bum, sir. Didn't you try to fracture his skull more than once?"

The C. O. chased all three culprits out of the Operations shack with a wielded chair. Then he climbed up to his room to bask in self-condemnation. After all a guy could come to love even a kangaroo if he kept it around long enough.

Upon reaching the hiding place of the D. H. 9 between Nancy and Toul, Phineas was overjoyed to find that no one had tampered with it. He slept beside it all night and in the morning began to fasten a phonograph to the floor of the rear pit. He put on a record when that task was completed and tied a length of twine to the miniature arm that set the record whirling. A test proved its efficiency. Phineas then repaired to the woods to wait for dusk. He hoped that some of the records that he had purchased in Nancy had not been used too much.

"Haw-w-w-w," he chuckled. "To think that some day I would sing opera. Well, I hope what I think is true is true. A Pinkham hunch is nothing to scoff at."

The day wore on. Phineas nibbled at a cake of chocolate for lunch. When the sun was about ready to don its pink and orange pajamas, he took helmet and goggles out of the pocket of his coat and put them on. The visored headpiece of a colonel was tossed into the bushes and Phineas had a sneaky feeling that he would have no further use for it.

NOW let us take a squint into a Heinie *Staffel* near Metz. A tall, barrel-chested Teuton with a voice that would drown out four fog horns, was

standing close to a Fokker D-7 pulling on his gloves. The *Rittmeister* Otto Friedrich von Schram, great basso of German opera, grinned at his *Staffel Kommandant*.

"Ach, I find her if she is there, *Excelenz*. Fraulein Satan ist almost safe, ja! Und das Pingham? Dead he ist, nein? Weeks odder weeks ve hear noting from der deffil. Fraulein Satan nefer fails, *hein? Auf Wiedersehn*, I go und take idt back der Fraulein." With a magnificent gesture he swung up to his battle wagon, his stentorian voice booming a line from the immortal opera, *Faust*:

"*Den Bo-o-o-osen sind sie-e-e-e lo-o-o-o-os, die-e-e-e Bo-o-o-o-osen si-i-ind Geblieden—*"

The prop hardly drowned out his voice when he gave the Fokker power plant the works and shot down the field.

Across the lines, Phineas Pinkham, to a tune of protesting struts and loose wires, managed to get his D. H. 9 off the ground. It climbed skyward with all the grace and agility of a hippo with rheumatism and the jokesmith pilot had but five thousand feet when he looked down at a chateau that squatted on the banks of the Moselle near Nomeny. There, he had learned three days before, Frieda Stenje had gone in a huff after her third degree in Nancy.

"A joke on Pinkham, huh?" the flying colonel from western Iowa soliloquized. "Haw-w-w-w! A loaded gun is no joke in any language. Now if the Frog had been a better shot, well, it would've been Finis Pinkham instead of Phineas, haw-w-w! I—I wonder—? The Frog said he thought there were blanks in it. Yeah—yeah, Eureka, as the Greek said when he looked for a good lunch wagon site. I—"

He looked around the sky territory. Another power plant was mixing it with the roar of his own asthmatic engine. A Fokker came thundering down. In the pit was the gloating Otto von Schram.

"Ach, der Yangkee two-seater vunce!" he said to himself gleefully. "I giff der Krupp spittle, ja." He kept boring down through the ether, sent in a burst, and then became cognizant of the fact that the Allied ship was as devoid of armament as a dove carrying an olive branch in its teeth. Now there was music in Otto's soul and therefore he could not be a ruthless squarehead. But he had to get down onto the carpet to see if Fraulein Satan was in the neighborhood. So he let the Pinkham crate have it in the floating ribs.

Phineas cut the gun and pulled a string. Above the chant of the Fokker D-7 a silvery, high-pitched voice began to shimmer through the dusky firmament. Von Schram heard it as he overshoot the D. H. and he shook as if palsy had seized him.

"Nein, nein!" he guttered. "*Das ist —nein idt cannodt be. Ach du Lieber! Mein Liebchen—Gott!*" He went into a loop and put a gag on the Mercedes. Clearer now were the soul-stirring strains of *To the Evening Star*: O-o-o-o-o-o! du-u me-e-ein ho-o-older,

A-a-a-a-ben-n-nd s t e r n. Wohl grusst—"

"Gott in Himmel!" wailed Otto von Schram. "Ach du Lieber!" He pawed at both eyes and let the Fokker D-7 have its own head. "Noddings can I do when I hear idt—soft like der eiderdown!"

Colonel Pinkham side-slipped toward the German crate and poured shots from a service revolver into the shimmering prop.

"Boys, it worked!" he howled. "He's gaga. Another Pinkham idea is vindi—ow-wowow!" He tried to pull out of the way of the Fokker but a wingtip kissed one of Otto's. Amid a sickening crackling sound both busses went spiraling to the carpet. "I—bet—they was blanks I shot," Phineas gulped. "I should've knocked that prop dizzy with them slugs. I've been framed again, I bet—"

Phineas stopped talking then and laid his attention to fighting the drunken D. H. down to the real estate. Off to the left, three miles away, he caught a glimpse of the chateau on the Moselle. Twenty seconds later the two-seater kissed the earth, ground-looped and then lowered its snout and ploughed into a tree. Fifty feet away Phineas picked himself up and tested his superstructure. When he was sure everything was intact, he looked around for von Schram. A quarter of an hour passed before he sighted the Kraut. The man with the big voice was staggering out of a frog pond in the middle of which was the tail of the Fokker protruding like a church steeple.

Colonel Pinkham had to get his own feet muddy and wet to drag his quarry to dry ground. He tied von Schram securely with rope before all the Kraut's marbles had rolled back into their grooves. By the time his eyes had uncrossed Phineas was standing beside him with a phonograph under his arm. There was a big horn attached to the instrument.

"Bong swar, mein Froind," the Yank chortled in greeting. "Would you like it sung in English now? Haw-w-w-w!"

"Was ist?" yipped the Kraut. "Ach, zo you are das Pingham! Der bick teet' mit der ears, nein? Donnervetter! Der moosie box was das yedt. Ach Gott!"

"If you'll excuse me for a while," said Phineas, "I must go and give a concert. First, though, I'll put a muffler on your pipes as if you should start chirping, they'd hear you *Under den Lindens!* Haw-w-w-w! Open up the fly trap, *mein Herr*, or I'll pry 'em open. Nice teeth you haff *und* would you want to take them out efery night? Tsk tsk, *nein*. Open up now!"

"Now," Phineas said to himself as he walked away, after tying and gagging his prisoner. "I will see if I am right about a double-play combination. It was a mistake to make me a swivel chair jockey as I am too much use to the Allies as a Looey. Oh, sa-a-ay it wi-i-ith mu-u-usic, beaulti-ful-l-l music. Da da da, da-da-da-da, da da da—haw-w-w-w! I should sing for the bull in Carmen."

THREE miles across country and Phineas came to a line of aspens on the banks of the Moselle. He set the

music box down, took off the record of the opera *Tannhauser* and selected a circular disc in which snuggled the booming voice of Otto von Schram. Out into the night, heading for the big gloomy chateau two hundred yards away, went the great lung power of Otto von Schram, toast of opera addicts of two continents: "*In ein-n-em Augenbli-ick ge-e-ewha-r-r-rt du-u-u-u Liebe. Wa-a-a-as muhe kaum-m-m in la-a-a-nger Zeit—*"

While the music was blaring, Colonel Pinkham adjusted a big black curling mustache under his bugle. He had not the jewels of Otto but he could pull the collar of his coat up around his ears. His nose was big enough and anyway it would be dark under the aspens if anyone should succumb to the lure of the Heinie's million-dollar tonsils.

"Gosh, I am deaf," Phineas muttered. "If I have to keep this thing going—huh, do I see somethin' moving already? Haw-w-w-w! Well, well, come into the parlor said the spider to the fly. What pretty teeth you ought to have. An' what big eyes, says Gran'ma. I—" The voice of Otto von Schram suddenly died. Phineas lifted the needle into the clear to cut out the scratching sound and kicked the phonograph, horn and all, down the banks of the Moselle. In the shadows he waited. A slim figure came close and a musical voice tickled the Pinkham otic assembly.

"Otto, my Otto," said a voice filled with the yearning of a woman with bad heart palpitation. "You called—I com'!"

"*Liebchen!*" said Phineas from way down around his diaphragm. "*Comst du hier—ach Gott sie dank!*"

She came running and grabbed the Yank. Her head against his shoulder, she kept chattering: "I knew you would com', Otto. I do not kill this Pingham—der French *Schwein* he missed. But great plans I haff stolen, *mein Liebe*, ja. Der Kaiser, he forgives Frieda, *nein?*" Her white face looked up into Phineas' makeup at close quarters. "Kiss—Eek! You are nodd Otto. Who are you, you *verdamnt—?*"

"Bong sour, Frieda," grinned Phineas. "How did you like the music? I just give Otto a treat upstairs with one of the records you gave me. Boys, he saw a million evening stars. Oh, you want to fight, huh? Lay off or I'll have to smack you, Frieda. Haw-w-w-w! Papa'll bat your little ears off if you make another pass—there, that's right. Fraulein Satan, or I'm a goose with scales on."

"Ugly peeg!" screeched Frieda Stenje alias Fraulein Satan. "I lak to scratch it the eyes, *Leutnant* Pingham!"

"Colonel to you," Phineas corrected her, rendering Fraulein Satan as harmless as a lamb groggy with succulent lettuce. The Norwegian Thrush, her feathers ruffled, sounded more like a cornfield crow as she strained at her bonds and called Colonel Pinkham a rat in Scandinavian and other languages.

"Well, adoo for now, Fraulein," he sang out unperturbed. "I must go and pick up a friend of yours. You can sing duets together while you are in a Yankee klink waiting to see your law-

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yer, haw-w-w! I get it now—Potsdam sent you down here to bump off the great Pinkham, huh? And you was in on that joke in Nancy—you put real slugs in that gun for the Frog to shoot at me. Tsk, tsk, Frieda—was that nice? Well, I read an old magazine where I hid that night, little one, an' there was your picture alongside of Otto's. I put you two together and it added up right. I guess it's a gift. I will take back the plans you have got on you when I git back here with your weakness, Frieda. Until then, adoo my little tied-up chickadee."

When he finally corralled both plans and prisoners and hustled them off, Coloney Phineas Pinkham did not get as far as Nancy. Six M. P.'s and a carload of Yankee brass hats intercepted him at a road junction three miles from where the D. H. 9 was hugging a tree. "Don't make a move, Pinkham!" ripped out a brigadier. "We have got

you, you deserter!"

"And look what I got," the miscreant chirped happily. "Haw! Meet Fraulein Satan and the Rittmeister Otto von Schram. Boys, can he sing! He could stand right here and announce trains in the Berlin railroad station. Sing for the boys, Otto!"

"Bah!"

"There, you see?" grinned Phineas. "Now it's your turn, Frieda." Fraulein Satan kicked the Pinkham shins.

"I have the papers that she lifted from the Frog," said Phineas, handing the leather case to the brigadier. The brass hat sat down with a long-drawn sigh.

"Now we can't shoot him," he groaned. "He brings in the biggest spy in Europe, knocks off von Schram—huh, if he fell into a well full of rattlesnakes, he would come up carrying a basket of Easter eggs."

TWO days later Phineas Pinkham walked into the farmhouse on the Ninth Pursuit drome and grinned at Major Garrity. "Hello, bums!" he tossed at the bug-eyed pilots. "Did ya miss me?"

"Yessir, nosir, yessir," stammered Bump Gillis. "Congratulations, Colonel. I don't know how you do it, you big—er—sir."

"Colonel," began the Old Man, "I—er—"

Phineas shivered, then suddenly he turned to the brigadier who had accompanied him from Chaumont. "If I popped you in the snoot," he said, "what would I get, huh?"

"Busted, that's what! Surer than—"

KERWHOP! BONG!

Phineas looked down at the fallen officer, breathed on his knuckles, and stretched himself like a tomcat getting up from a snooze. "Now I'm busted, haw-w-w-w!" he guffawed. He went over to a chair and eased his weary frame into it. He grinned at the Old Man.

"Boys," he sighed, "ain't it good to git home!"

Planes Rout the Poachers

(Continued from page 12)

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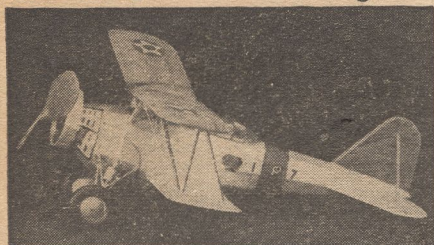
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was a tapered-wing biplane equipped with a Twin Wasp Jr. Tests of the XB2Y-1 were continued on into the summer of 1934; the latest news divulged indicates that this type is not fully successful.

In 1933 the Curtiss Aeroplane and Motor Company completed the XF11C-3. This machine was a sequel to the F11C-2 of 1932, but it featured a retractable landing gear. Like the F11C-2 it was equipped with a Wright "Cyclone" of 715 horsepower. This product was put into service in 1934 and designated as a BF2C-1.

Later in 1934 the Curtiss company was actively engaged in building a two-seat dive-bomber, the XBC-1. Ill-starred, this ship shed its wings in a steep pull-out test dive. That marked its finish insofar as the Naval Air Service was concerned. The pilot had bailed out to safety.

The year 1934 closed with several items of news which tended to disprove the theory of 1931; i.e. that special equipment was to be used for each of the duties of scouting, dive-bombing, and torpedo-carrying.

One of these news items was the testing by the Navy of the Douglas T3D-2. This airplane, an outgrowth of the T3D-1 of 1931, is a four-seat biplane that has a wing span in the neighborhood of fifty-five feet and an overall length of approximately forty feet. Designed mainly for torpedo-carrying, the T3D-2 is powered by the Twin Wasp of 800 horsepower.

Another 1934 news item worthy of discussion was the receipt by the Vought company of an order totalling

almost two million dollars for 84 aircraft of the SBU-1 type introduced in 1932. These aircraft are furnished with the N. A. C. A. thermal control cowl as introduced on the F3J-1, a Hamilton controllable-pitch propeller, and split trailing wing-edges.

The designs of the previous years are now concluded in the Curtiss SBC-2, Douglas XTBD-1, Great Lakes B2G-1 and XTBG-1, and Northrop XBT-1.

The Curtiss machine named is a high-wing monoplane formerly designated the F12C-1. In being remodelled to meet the requirements of its scout and bombing functions, the designation was altered to SBC-2.

UNOFFICIAL reports indicate that very shortly the Navy will purchase a quantity of the Douglas type. Observers describe the XTBD-1 as a low-wing, all-metal monoplane with a retractable landing gear. If size is any indication, it is to carry the standard half-ton destructive load.

The Great Lakes B2G-1 design was also ill-starred. In early May of 1935 Lee Gehlbach, prominent test pilot, wrote a literally smashing finale to this prospective death-dealer. Lee bailed out to safety as wings tore off during a test dive. In the meantime, no news pertaining to the company's XTBG-1 has been divulged.

The XBT-1 is now under construction at the Northrop plant. In this design the manufacturer will probably adhere to his present policy of constructing only low-wing monoplanes.

Proven now is the belief prevalent among those who watched the Martin XT5M-1 in its initial trials at Anacostia. The dive-bomber has come to stay.

But has the design of such craft now completed a cycle? And will there presently be a reversion in the Navy to multi-purpose types, large torpedo-planes, and horizontal bombers?

The developments of the coming year will surely be watched with interest.

If Reds and Nazi
Clash

(Continued from page 25)

that a Russian defense would quickly be uncorked—for a protection of Danzig would actually mean protection of the western frontier of the U.S.S.R.

Here, then, is the actual basis for our cover. A Dornier military flying boat hurled off a depot ship in the Gulf of Danzig would mean that Germany was launching its invasion of the Corridor. Then Russian reconnaissance fighters of the A.N.T.3 class, equipped with the new streamlined pontoons (which we have been given to understand are suitable for landings on water, snow or ice) no doubt would sweep down on the raiders in an attempt to drive them off. Since the A.N.T.3s are equipped with all modern communication devices, it would then be up to the Nazis to destroy them be-

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fore they could transmit a thorough report on what was actually taking place.

Mr. Schomburg has depicted the first blow being struck. Russian observers have apprised a Red air force of the arrival of the depot ships, and a flight of A.N.T.s has roared to the Gulf intent on nipping the coup in the bud. The Red flyers have plunged in just as a gun-bristling Dornier has been catapulted from its ship, and already the alert Dornier gunners have brought down one of the onrushing Reds. But another A.N.T. now hurtling upon the tail of the huge Nazi flying boat threatens a vengeful onslaught; and on the depot ship below, an A-A gun has been

broken out to aid the hard-pressed Dornier.

Which force shall emerge victorious is a question. But should the Reds begin to get the upper hand in the skirmish, the depot ships stand ready with derricks to pick up returning or damaged Dorniers, hoist them aboard, and dash for the open sea and possible cover of the speedy German "pocket battleships."

But it is the aftermath of such an "incident" that is horrible to reflect upon. Such a clash would be the signal sending the German war dogs at the throats of the Russian wolves. Only the history of the future will tell us the story.

Why Don't You Form A Gas Model Club?

(Continued from page 48)

gas model aircraft in all its phases. To be eligible for membership a candidate must fulfill the following conditions: (1)—He must be of unquestionable character; (2)—He must be recommended by at least one member in good standing; and (3)—He must file his application on an approved Society form—an agreement in which he states that he thoroughly understands that if accepted as a member he will be on probation for a period of six months, during which period he may be dropped from membership should he violate any of the laws of the Society.

An applicant may be of any race, creed, or color—as long as he is a naturalized or native-born citizen. There is no age limit in the C.G.M.S., but the club is composed of two groups—Juniors and Seniors. All members twenty-one years of age or over belong to the senior group, all others the junior.

There is one particular condition which every member must meet: He must be able to produce, within his first six months with the Society, at least one complete gas model aircraft. All models submitted must have been constructed by the owner alone, or by the owner with the assistance of other members in good standing.

We're pretty strict, you say? Well, maybe. But we've found that the success of a club depends upon adherence to a strong set of rules. In our club, a fellow can join comparatively easily, but in the event that he should do anything that would be detrimental to the interests of the Society, he gets the well-known "bum's rush," and I don't mean maybe.

If you conduct your club in a similar manner, you will attract a better class of members. Possibly the initial growth of your club will be delayed a little because you are so stringent. But who cares if it takes a little longer to build up a good club? The ultimate reward is well worth the time spent. The same is true in model building—the longer you take, the better the finished product.

Now for some more "info" about the C.G.M.S. The officers are as follows: P. J. Sweeney, President; Sterling Harper, Jr., Vice-President and Treasurer; and John V. Moffitt, Secretary. The president has the job of presiding at all regular meetings and of appointing committees. He may also remove from such committees any members who fail in their appointed tasks. The vice-president and treasurer assumes the duties of the president at all meetings when the latter is absent, and he also takes care of all the financial affairs. The secretary posts notices of meetings, keeps the minutes, and is entrusted with all records and business of the Society.

The board of directors of the C.G.M.S. acts ex-officio in immediate club affairs and may also be called upon for advice whenever needed. The election of the board members is staggered in such a manner that at least three of the members remain in office for two consecutive terms. Re-election to the board is permissible, depending upon the ability of the officer in question. Good men are worth keeping on the job.

SO much for the administrative functions of the club. Now a word about the meetings. Regular meetings are held once a month. An interesting program is arranged, always different from the preceding one. In short, while the business routine of each meeting remains the same, the entertainment varies. Sometimes we have speakers, sometimes movies of gas models, and occasionally a "feed." We find that in following this procedure, it is not difficult to get a good "turnout" for each meeting.

The general procedure for our meetings is as follows: The business of the club is first on the program. This, of course, consists of the reading of the minutes of the previous meeting by the secretary, reading of reports of the various committees, and a report of the treasurer. Following this, the meeting is devoted either to open discussions of the science of gas model aeronautics, or a special speaker may be heard, say a representative of one of the airlines,



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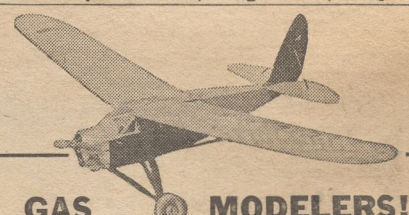
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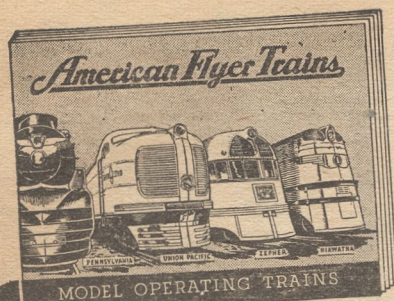
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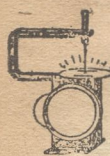
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an aircraft manufacturer, or anyone well versed in aeronautics. Sometimes, too, members bring their gas motors for demonstration.

But our greatest source of entertainment is our "movies." These prove to be of double value to us; for not only do they let us re-live many thrilling moments at our contests, but they also are of great worth in convincing prospective sponsors or donors of trophies that these models are really worthwhile and that they really fly.

You know that when you ask somebody to give a prize for a contest, he wants to know all about these gas models and he'll ask a million and one questions about what makes them run, how they land, are people really interested in them, and the like, before he will consider accommodating you. Here is where the "movie" proves its worth. "A picture is worth a thousand words." No truer statement was ever made.

Now then, a word about activities in the C.G.M.S. Our club now boasts a membership of sixty, all of whom either have already built or have in the process of construction, at least one gas model. It is a standing rule in the C.G.M.S. that, inasmuch as each member is the builder and owner of his model, the club can assume no responsibility for damage resulting in the operation of his model. Each member is cautioned to exercise extreme care at all times when flying his "crate." It is also understood that in contests, flying or otherwise, all contestants shall adhere strictly to the rules and regulations drawn up by the proper authorities.

The color scheme for C.G.M.S. mod-

els is optional. However, each member at all times displays his number and the initials of the club on his ship. His name and address also appear on his model so that in the event that it gets away from him when competing in a contest, the finder will know to whom it belongs.

Now this is the set-up we have in the C.G.M.S. By trial and error we have found it to be the best. At our first big contest, held in May 1936, we enjoyed an attendance of 15,000 intensely interested spectators. We have held two other successful contests since that time. Our May meet was broadcast over a national hook-up and was otherwise widely publicized. Several of our members have competed in two national contests and won places. Going into our second year, we ask you to watch our "exhaust"—for big things are in store for the C.G.M.S. during 1937.

I believe that the foregoing information is enough for anyone desiring to form a gas model club. But you must remember that you are getting into a lot of hard work. This must be understood by all you admit in your club. It is well worth the effort, though; for you will be repaid by countless hours of fun in the grandest of all hobbies.

I also believe that at this time a national gas model group is needed—one that is devoted entirely to the science of gas model aeronautics. Fortunately, the C.G.M.S. has made just that provision in its constitution. How about it, gas jobbers? Drop a line to us via FLYING ACES and tell us if you would like to form a chapter of this swell club of ours.

Construct the "Norseman"

(Continued from page 60)

strong resemblance to a Bellanca Pace-maker or the 1935 Stinson Reliant. Any one who has constructed a model of either of these ships should find building a model of the "Norseman" comparatively simple. For those who have not already built a solid scale model and find the "Norseman" appealing, they, too, will find this ship easy enough to make as a beginner. By reading the following instructions carefully and paying attention to details, you'll soon find yourself "bitten" by the solid builders bug.

Models ranging between 12 and 15 inches in span make attractive pieces. By doubling the dimensions of the three-view plan, you will find that it measures 12 $\frac{1}{2}$ ". Take it from me, my model of the same dimension is certainly an attractive one. Painted with bright yellow wings, blue fuselage, and glistening aluminum pontoons, it certainly looks top-notch. To those who prefer bigger models, my compliments—and may the pleasure be all yours.

Naturally, the first suggestion offered in the way of working materials is balsa. Besides being easiest to work with and inexpensive, it's a "natural" for whittlers and sandpaper massagers. All that will be necessary is a sharp

carving knife, a sharp safety razor, several grades of sandpaper, and plastic wood. Don't use a chisel, or putty for fillet joinings.

The cross section templates for wing and fuselage should be cut out ready for use. A drawing of each section is made upon stiff paper or flexible cardboard. Their inner portions are cut out perfectly. Then they are cut in the middle. To use them, take each one and place it against its respective place on the fuselage or wing and hold both up to the light. If it's a perfect fit, no light will show through. And that is requisite.

WINGS

START with the wings first and go about it in the following manner: Choose a piece of soft, clear-grained knot-free balsa plank. With your safety razor, trim the round edges of the wing after you have obtained the correct shape. Either the knife or coarse sandpaper may be used to get the desired camber in the wing. Work this out with extreme care and finish off with a fine sanding.

At this point, check for uniformity of the airfoil section by slipping your wing template (section A-A) over the

surface of the wing. Sand down the bumps if any. With this completed, mark the aileron and wing flap outlines on both the upper and lower surfaces of the wing.

The next step is cutting out the tail parts. Use soft balsa. The safety razor is again employed for the trimming process and sanding the parts is necessary to obtain the streamline shape. Note especially the shape of the lower part of the vertical fin. The rudder and vertical fin are, of course, made in one piece. The hinge lines are marked with a sharp pencil point.

Before attempting to shape the pontoons, cut out side, top, and front view templates. Trace the top and side views on each of the blocks and cut to shape with care. Be especially careful of the scalloping on the underside of the floats. Check by using the front view template. Complete both floats with fine sanding.

FUSELAGE

THE next step is the fuselage. Templates of the side and top view are necessary. By referring to sections B-B and C-C and cutting away on the block carefully, you should have a neatly shaped body ready for its final sanding. A point that is brought to your attention is the fact that the portion of the fuselage which swoops down abruptly at the tail end is for the purpose of accommodating the vertical fin.

The fuselage stubs, shown clearly on the front and side view drawings, are cut to shape; and as soon as they are completed with a sand finish, cement them to the fuselage sides. Plastic wood

is used to form the fillet joints. Apply this carefully. The pontoon struts are next cut to shape and streamlined. They may immediately be joined to the floats. Check with the drawings when attaching the floats to the fuselage.

Attach the tail surfaces in position and apply plastic wood in making the filleting. White thread may be used for the tail brace wires.

ASSEMBLY

IN assembling the wings to the fuselage it will be necessary first to cut the wings slightly shorter. Each panel should measure $5\frac{15}{16}$ " long. They are then cemented flush to the sides of the cabin roof with plenty of cement. At the same time, set the dihedral angle. Have the wing struts in readiness and attach as soon as possible so that all cemented members may harden in the same period. Plastic wood is again used to make the wing fillets. The model is then given a general cleaning up with smooth sandpaper. The prop is carved out of either balsa or white pine and made to spin easily.

Various color combinations may be used for your model. Whichever you choose, be sure to apply only a good grade of paint or brushing lacquer. The pontoons are always painted aluminum, as is the prop. The nose of the cowling is painted black if a built-up motor is not incorporated in it. The red, white, and green navigation lights are set in their respective positions, as can be seen on the drawings. As a preservative, give the model one coat of clear lacquer.

Britain's Avro Trainer

(Continued from page 44)

wood color. In event you do not wish to carve a propeller, you may pin a metal one on and let it go at that. But—be sure your propeller turns clockwise, for British have their airscrews just the opposite from our American props.

In the plans you will note that serv-

ice coloring is suggested for your model. Of course, if you build your model with a sportsman flyer in mind rather than His Majesty's Air Corps, the color scheme is up to you. In that case, give the ship a licence number like G-ADXI—or any series starting with G-A.

Make the Vultee Attack

(Continued from page 39)

panel to the proper stub rib with thickened cement and hold in position until set. As the model will not fly properly if the wing panels are not set in agreement with each other and at the angle for which the whole structure has been built, it is of the utmost importance that extra care be taken at this point.

LANDING GEAR

THE landing gear consists of a single heavy strut cut to size from $\frac{1}{4}$ " sheet. This strut is shown in detail as well as on the front and side views. The cross section given is accurate, as the whole strut is hinged on the real ship to swing inward. Since the length of this strut has been increased for the flying model, it became impossible to correctly hinge the landing gear for retraction as was done on the large

ship. The sheet balsa sections marked "F" and "H" are cemented in place as shown on the side and front views.

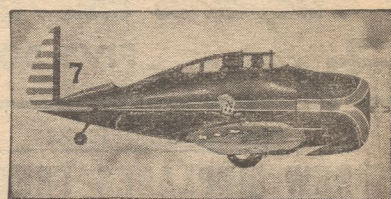
The $1\frac{3}{8}$ " wheels are a standard size and are mounted on the .028 wire axles. The axles, as shown on the side view, are zig-zagged against the outer face of the struts so that a twist on the wheel will not loosen them. The completed struts are slid into the openings provided for them in the wings and they are then copiously cemented in place.

COWLING PROP AND MOTOR

OUR cowling is built up of four discs of $\frac{1}{4}$ " sheet balsa $2\frac{1}{8}$ " in diameter. Each is cut out as shown on the cowl-ing cross section. The cowling is shaped and sanded only after this preliminary step has been taken. The third ply—the one that provides support for the nose

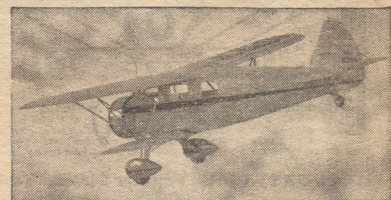
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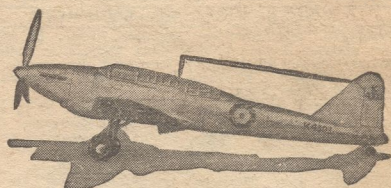
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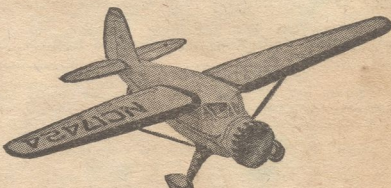
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Here is another real beauty for which the instructions and layout are given for coloring the model two ways, either all vermilion with black trim as the Berry Brothers' contest kits are colored, or the wing panel stabilizer rudder light yellow, fuselage colored white, beautifully striped with red on both fuselage and wheel shoes and black lettering. A beautiful model for fine flights. Span 17 1/4". Kit D-62, complete except liquids, **90c** postfree



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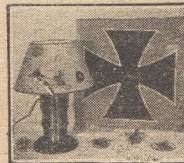
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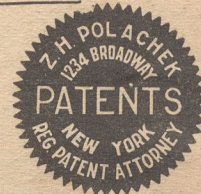
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plug—has a square hole cut in it to receive the said plug.

The nose plug is an easily built-up dummy motor and is detachable. The crank-case itself is a block 13/16" sq. by 11/16", shaped as shown both on the plan and in the detail. To the rear of it is glued a square plug of 1/4" sheet to fit the hole already cut in the supporting ply of the cowl.

The cylinders, nine in number, are rounded from 1/4" sq. stock. The rocker arm housings, of which there are eighteen, two per cylinder, are small pieces of 3/16" by 1/8" cut to length and sanded to shape. The push rods are small pieces of bamboo or wire. Drill the completed unit for the shaft, and after cutting a bearing from tin, as shown on the plan, force its pointed end into the face of the plug. Cut also at this time another bearing to be fitted later into the propeller.

The propeller is cut from a blank 7 1/2" by 1 3/8" by 7/8". The diagonals are for a block 2 1/4" wide, the excess having been eliminated on the drawing. The tips are rounded after the blades have been carved. Give care to the balancing of the propeller, for imperfect balance impairs the flying qualities of the model. Bend the front end of the shaft U-shaped and sink it into the face of the propeller hub. Force the tin bearing, already cut, into the rear of the hub. Slide an extra washer and the dummy motor-plug over the shaft and bend the rubber hook.

The Vultee itself was a natural aluminum color. The motive power is six strands of 1/8" flat rubber.

FLYING THE MODEL

TEST the model hand-launched over deep grass if possible. If such a procedure is not possible, test hop the ship on a few turns R.O.G. As the correct balance is ascertained, increase the number of turns gradually to a maximum. A small weight may be used for

balancing purposes.

In testing the original model it was observed to have a tendency to fly a low, straight course at exceptionally high speed. This flight tendency, if prevalent in your model, will assure many a flight thrill. The ship can take it, so do not worry about minor collisions with obstacles.

Answers

TO QUESTIONS ON PAGE 17

- 1—A Diesel motor is a compression-ignition engine in which fuel vapor under great pressure is exploded by the heat of the compression. Thus no electrical ignition system is required.
- 2—The Northrop 2-E is a two-seat bomber monoplane built mainly for export purposes.
- 3—C. W. A. Scott is the noted British air pilot who, with Campbell Black, won the England to Australia race two years ago, and who recently won the England to South Africa air race.
- 4—The Lockheed Aircraft Corporation has its office and works at Burbank, California.
- 5—The Czechoslovakian Bren gun is now being used widely by the British Army and may be adopted by the R.A.F.
- 6—The four strokes of a four-stroke engine are induction, compression, explosion, and exhaust.
- 7—The Seversky plant has just built a new four-in-one plane which can be adapted for primary, basic, or advanced training, and by changing the wing panels, it can be used for a high speed reconnaissance.
- 8—Mrs. Louise Thaden is the noted American woman pilot who recently won the Bendix Trophy race. She is also a member of the Bureau of Air Commerce.
- 9—The Sopwith Camel scored most victories on the Western front. In actual figures, 1,294.
- 10—Kolchougolumin is a new alloy invented by the Soviet Government for their A.N.T. planes. It has a tensile strength of 25 tons to the square inch.

Santa makes a 3 POINT LANDING in a COMET



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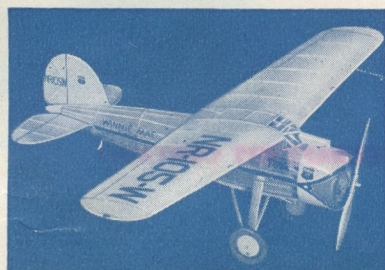
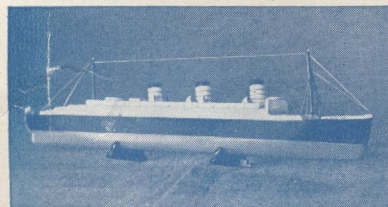
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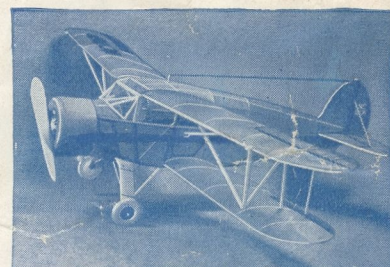
25c R. M. S. Queen Mary
10c Size

Kit No. 2B-13
Kit No. 1B-12

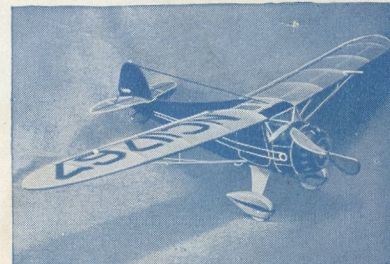
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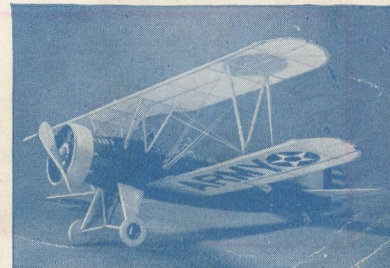
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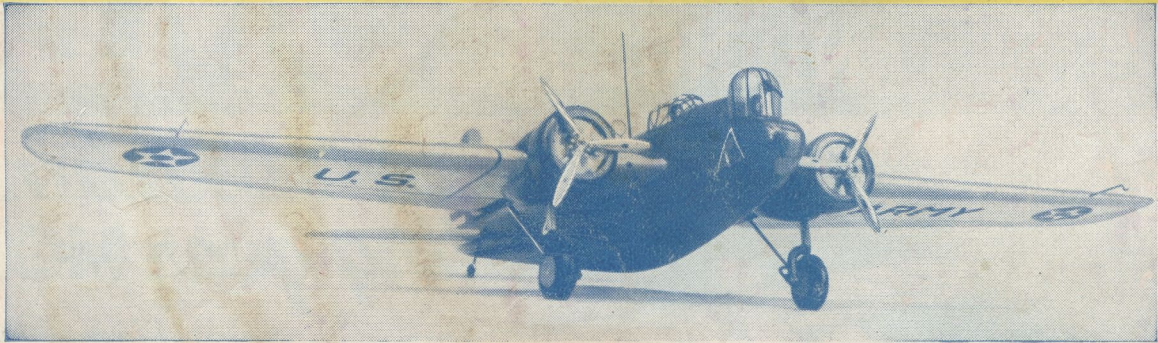
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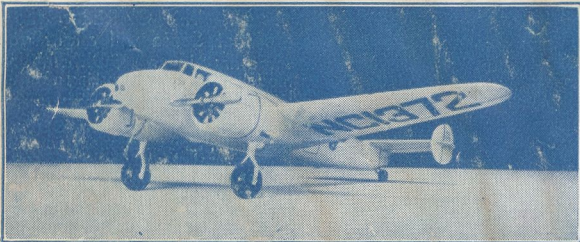
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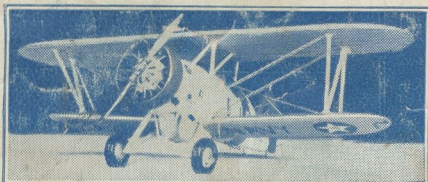
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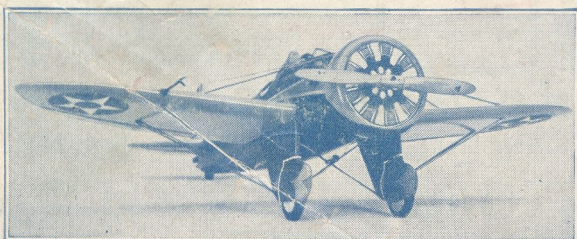
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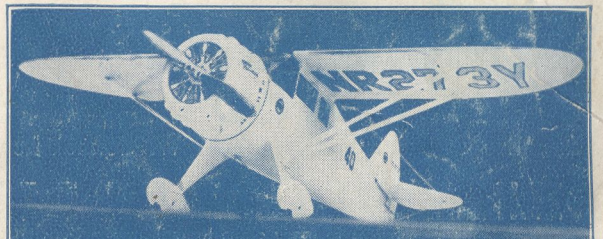
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